Alabama Statewide Airport Pavement Management Program Update

Jack Edwards National Airport (JKA)

Final Report

February 2022

Submitted to

Alabama Aeronautics Bureau

Submitted by

JVIATION

All About Pavements, Inc (API)
www.allaboutpavements.com
Pavement Management – Evaluation – Testing - Design

ALABAMA STATEWIDE AIRPORT PAVEMENT MANAGEMENT PROGRAM UPDATE

Jack Edwards National Airport, Gulf Shores (JKA)

FINAL REPORT

Prepared For:

Alabama Aeronautics Bureau
1409 Coliseum Blvd.
Montgomery, AL 36110

Prepared By:

ALL ABOUT PAVEMENTS, INC.
205 Ramblewood Drive
Chatham, Illinois 62629

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Executive Summary

The Jviation Inc. team, which included All About Pavements, Inc., (API) was awarded a contract by the Alabama Department of Transportation's Aeronautics Bureau (ALDOT) in 2018 to update the existing Alabama Statewide Airport Pavement Management Program (APMP). The scope of this project includes the airside pavement network at Jack Edwards National Airport (JKA).

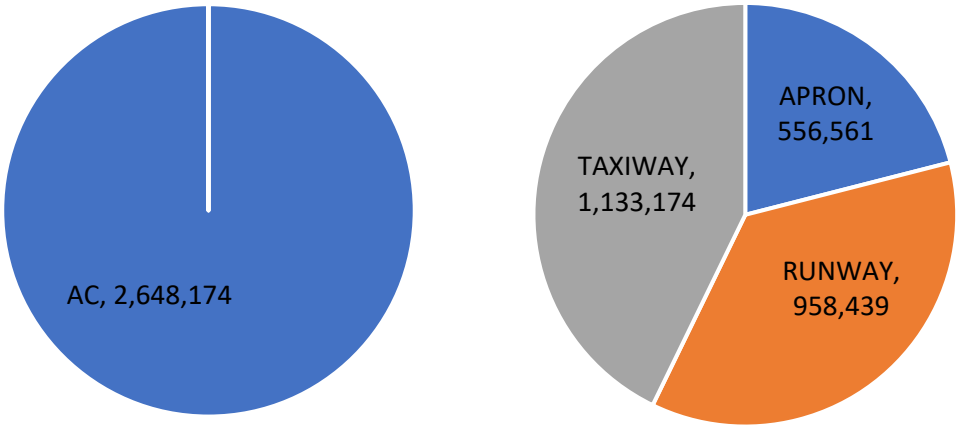
The following APMP tasks were completed to achieve the project objectives at JKA:

- Update the PAVER work history with records review information provided by ALDOT
- Conduct a visual pavement condition survey of the airfield pavements
- Update the PAVER database with inventory and condition data
- Update Maintenance and Rehabilitation (M&R) policies and unit costs
- Develop a 7-Year Pavement Capital Improvement Program (PCIP) with associated cost estimates

ES.1 Pavement Inventory

There are 23 branches and 37 sections within JKA's pavement network with a total surface area of approximately 2.65 million square feet (sf). Figure ES-1 shows the distribution of the pavement network by surface type and branch use.

Figure ES-1: Pavement Area (sf) by Surface Type and Branch Use.



ES.2 Pavement Condition

Visual pavement inspections were conducted in November 2019 using the Pavement Condition Index (PCI) method as specified in ASTM D5340-12 and FAA AC 150/5380-6C. The PCI is a numerical rating scale from 0 to 100 that provides a measure of the pavement's functional surface condition. The overall

area-weighted network PCI (AW PCI) for the JKA pavement network is 75, representing a "Satisfactory" condition. The network area-weighted pavement age (AW Age) is 16 years.

Table ES-1 is a listing of the section PCI values and ratings.

Table ES-1: JKA Section PCI Values and Ratings.

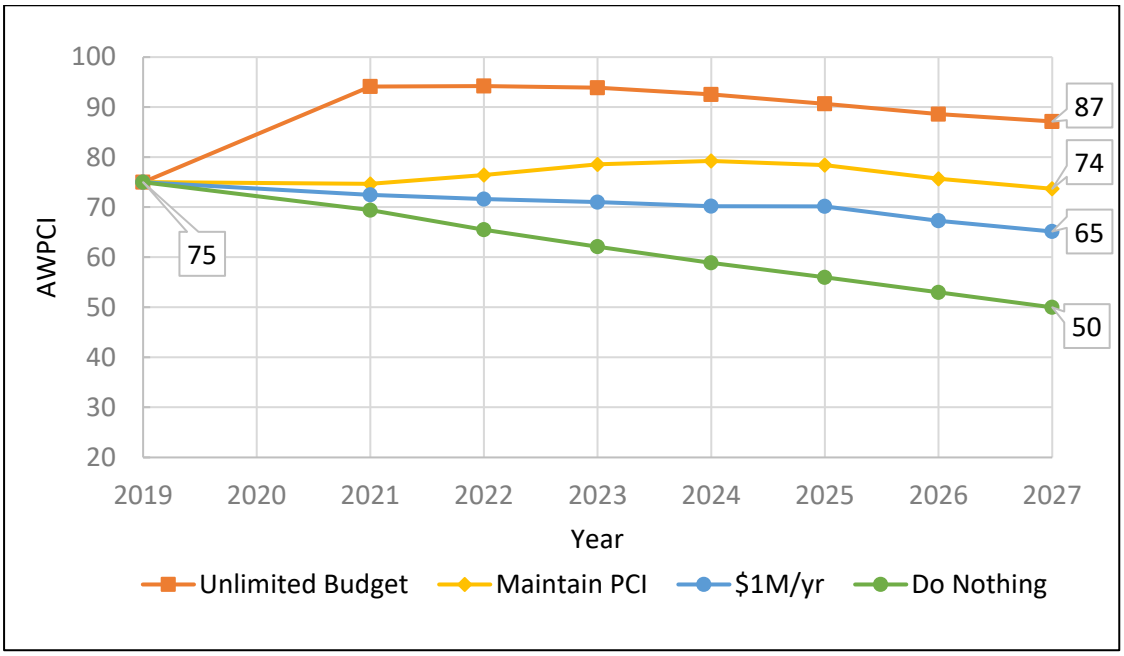
Branch ID	Name	Section ID	Surface	Area, sf	PCI	PCI Category
A01	Apron 01	01	AC	163,970	63	Fair
A01	Apron 01	02	AC	146,625	66	Fair
A01	Apron 01	03	AC	114,750	70	Fair
A02	Apron 02	01	AC	16,338	61	Fair
A03	Apron 03	01	AC	4,696	72	Satisfactory
A03	Apron 03	02	AC	54,298	84	Satisfactory
A04	Apron 04	01	AC	55,884	89	Good
R0927	Runway 09-27	01	AC	46,900	80	Satisfactory
R0927	Runway 09-27	02	AC	649,300	69	Fair
R1735	Runway 17-35	01	AC	62,550	85	Satisfactory
R1735	Runway 17-35	02	AC	15,000	65	Fair
R1735	Runway 17-35	03	AC	15,039	68	Fair
R1735	Runway 17-35	04	AC	169,650	92	Good
T01	Taxiway 01	01	AC	38,560	59	Fair
TA	Taxiway A	01	AC	42,086	72	Satisfactory
TA	Taxiway A	02	AC	16,651	83	Satisfactory
TA	Taxiway A	03	AC	14,853	84	Satisfactory
TA	Taxiway A	04	AC	289,807	67	Fair
TA1	Taxiway A1	01	AC	21,221	68	Fair
TA2	Taxiway A2 01	01	AC	27,287	65	Fair
TA3	Taxiway A3	01	AC	27,301	63	Fair
TA4	Taxiway A4	01	AC	27,286	68	Fair
TA5	Taxiway A5	01	AC	12,855	61	Fair
TC	Taxiway C	01	AC	28,905	72	Satisfactory
TC	Taxiway C	02	AC	38,647	99	Good
TC01	Taxiway Connector 01	01	AC	8,460	92	Good
TC02	Taxiway Connector 02	01	AC	8,043	72	Satisfactory
TC1	Taxiway C1	01	AC	7,029	88	Good
TC1	Taxiway C1	02	AC	6,550	90	Good
TC2	Taxiway C2	01	AC	10,296	89	Good
TE	Taxiway E	01	AC	75,147	88	Good
TE1	Taxiway E1	01	AC	8,867	91	Good
TF	Taxiway F	01	AC	49,007	88	Good

Branch ID	Name	Section ID	Surface	Area, sf	PCI	PCI Category
TF	Taxiway F	02	AC	12,064	89	Good
THANG01	Taxiway Hangar 01	01	AC	114,229	75	Satisfactory
THANG02	Taxiway Hangar 02	01	AC	160,823	94	Good
THANG02	Taxiway Hangar 02	02	AC	87,200	91	Good

ES.3 Pavement Maintenance and Repair Funding Levels

The PAVER database was updated with 2019 condition data, maintenance and repair (M&R) policies, and unit costs; which were then used to evaluate the effect of multiple funding levels on the overall future pavement condition. Figure ES-2 presents the forecasted JKA network PCI values for each funding level.

Figure ES-2: M&R Funding Levels.



ES.4 Pavement Capital Improvement Program (PCIP)

The analysis output from the unlimited funding budget scenario was used as a starting point in developing the PCIP. For this scenario, sections were grouped into projects to allow for a logical construction sequence. Table ES-2 summarizes the 7-year PCIP, which has an estimated total cost of approximately $10.1 million. These recommendations are based on a network-level evaluation. Project-level evaluations should be conducted prior to developing design and bid package documents.

Table ES-2: Summary of Pavement Capital Improvement Program.

Project Year	CIP Project	Total Project Cost	Total Project Area, sf	AWPCI Before	AWPCI After
2021	JKA_21-01_Runway 17-35 Preservation	$196,389	301,960	85	91
	JKA_21-02_Taxiway E Preservation	$65,872	75,147	84	92
	JKA_21-03_Taxiway F Preservation	$42,959	49,007	84	92
	JKA_21-04_Taxiway C Preservation	$47,035	53,657	94	98
	JKA_21-05_Aprons 03 & 04 Preservation	$96,583	110,182	83	90
	JKA_21-06_Taxiway Hangar 02 Preservation	$217,412	248,023	89	96
	JKA_21-07_Runway 09-27 Rehabilitation	$3,734,321	842,189	60	100
2022	JKA_22-01_Taxiway A Rehabilitation	$1,722,529	370,453	56	100
2023	JKA_23-01_Apron 01 Rehabilitation	$2,156,331	462,293	58	100
	JKA_23-02_Aprons 02 & 03 Rehabilitation	$117,710	21,034	56	100
2024	JKA_24-01_Taxiway Hangar 01 Rehabilitation	$548,797	114,229	60	100
	JKA_24-02_Runway 09-27 Surface Treatment	$535,996	842,189	96	99
2025	JKA_25-01_Taxiway A Surface Treatment	$242,841	370,453	96	99
2026	JKA_26-01_Apron 01 Surface Treatment	$312,136	462,293	94	98
	JKA_26-02_Aprons 02 & 03 Surface Treatment	$14,202	21,034	93	98
	Total	**$10,051,113**			

In addition to the major rehabilitation needs that are identified in the PCIP, PAVER was used to develop maintenance activities to repair specific PCI distresses in Year 1. The estimated costs for these maintenance activities are $81,757 as summarized in Table ES-3.

Table ES-3: Summary of Localized Maintenance Plan.

Policy	Work Description	Work Quantity	Work Unit	Work Cost
Preventive	Crack Sealing - AC	12,140	Ft	$47,955
	Patching - AC Full-Depth	1,349	SqFt	$33,802
			Total	**$81,757**

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1 Introduction

1.1. Overview

The Alabama Department of Transportation's Aeronautics Bureau (ALDOT) is responsible for preserving and enhancing Alabama's air transportation system, which consists of 74 general aviation airports throughout the State. ALDOT implemented an Airport Pavement Management Program (APMP) in 2008 using the PAVER system. ALDOT awarded a project in 2018 to Jviation Inc. (Jviation) to update the System Plan and conduct an Economic Analysis for the Alabama airports. The scope of work also included an update of the APMP for 59 general aviation airports, which was conducted by All About Pavements, Inc., (API), a Jviation team member.

With this update of the APMP, the Alabama airports continue to be eligible for FAA funding for major pavement rehabilitation work under the Airport Improvement Program (AIP) since an APMP meets the pavement maintenance management requirements described in Appendix A of AC 150/5380-6C.

This report discusses the evaluation of the airside pavements at Jack Edwards National Airport (JKA), the current and forecasted pavement condition, and the development of the Pavement Capital Improvement Program (PCIP).

1.2. Work Scope

The goals of the Alabama Statewide Airport Pavement Management Update program are as follows:

- Conduct a visual pavement inspection of the asphalt surfaced pavements for 59 of the 74 general aviation airports in Alabama.
- Based on the visual inspection analysis results, develop a 7-year PCIP for each airport.

The scope of work is as shown below:

- Conduct a Records Review
- Update Pavement Network Definition
- Conduct Pavement Condition Surveys
- Update and customize existing APMP PAVER database
- Develop PCIP and associated project cost estimates
- Prepare Draft and Final Reports
- Develop a web-based viewer for reporting APMP data

As required in the Scope of Work, a detailed pavement condition survey was not conducted for any Portland Cement Concrete (PCC) aprons and PCC taxiways longer than 2,000 ft. Instead, a condition rating of "Good", "Fair", or "Poor" was assigned based on the overall pavement condition.

The deliverable products include a PAVER 7.0 database, individual airport evaluation reports, a statewide summary report, and the web viewer. The JKA report will be one of the 59 individual airport reports that will be available on ALDOT's website.

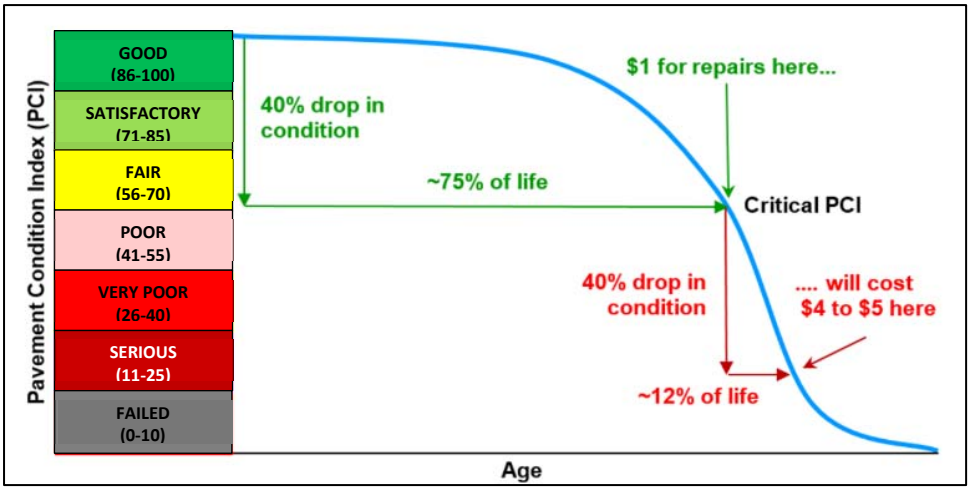
1.3. Pavement Management Concept

An APMP provides an integrated framework for comprehensive evaluation and decision making for managing airfield pavements. The essential components of an effective APMP provide for an objective evaluation of the condition of existing pavements, identification of short-term and long-range major rehabilitation work, necessary improvements in the pavement structural capacity, and the recurring maintenance work that should be completed each year. The APMP will also provide a budget for each of these types of pavement construction.

Historically, most organizations have made maintenance decisions based on past experience, without the benefit of documented data or analysis. This practice does not encourage life cycle cost analysis, nor the evaluation of cost effectiveness of alternate scenarios, and can lead to the inefficient use of funds. With limited allocated funding for Maintenance and Repair (M&R) Program projects, a defined procedure for setting priorities and schedules that will maximize the funds available is more important than ever.

In examining the lifespan of a 20-year pavement, a "Good" to "Fair" condition rating may last only 5 to 15 years. After that point, the rate of deterioration of pavements accelerates sharply as the age of the pavement increases, and within five years, the pavement may deteriorate to the point of failure. In order to extend pavement life, maintenance and repairs need to be scheduled and performed before the pavement surface declines to a "fair" condition. The point at which rehabilitation can be done before the steep decline occurs is called the "critical PCI", and is generally considered to occur when the Pavement Condition Index (PCI) is between 60 and 70 for general aviation airports. If the work is done before deterioration accelerates, the cost of rehabilitation can be reduced as shown in Figure 1.1.

Figure 1.1: Pavement Management Concept.



2 Airfield Pavement Inventory

2.1. Introduction

JKA is a General Aviation (GA) airport located approximately 2 miles north of Gulf Shores. The airport was activated in March 1978 and is owned and operated by the Gulf Shores Airport Authority. Figure 2.1 shows an aerial image of the airport.

Figure 2.1: Jack Edwards National Airport.

(Source: Google Earth)

2.2. Pavement Inventory

JKA consists of two runways, parallel taxiways, and multiple connector taxiways and aprons. The total pavement area is approximately 2.65 million square feet. All pavements at JKA include are Asphalt Concrete (AC) surfaced. A complete listing of the pavement sections is included in Appendix A. The primary runway, Runway 09-27 is 6,962 ft. long and 100 ft. wide. The secondary runway, Runway 17-35 is 3,596 ft. long and 75 ft. wide.

A records search was undertaken to identify any preservation or rehabilitation work that has occurred at JKA since the last APMP update in 2009. The following records that were provided by ALDOT were reviewed, and the PAVER database was updated with work history information:

- Taxiway C Extension, 2009
- Construction of Access Taxiways, 2010
- Rehabilitation of Runway 17-35, 2012

- Crackseal Runway 09-27, 2013
- Construction of Aircraft Parking Apron and Taxiway Connectors, 2015

2.3. Climatic Conditions

Table 3.1 provides a summary of the climatic data for the geographic region that includes JKA. As the table shows, the pavements at JKA are not exposed to any freeze-thaw cycles. The mean air temperature for January ranges from an average low of 39 degrees ^{o}F to an average high of 61 degrees ^{o}F. The average annual rainfall at JKA is near 68 inches.

Table 2.1: Average Annual Temperatures and Rainfall for JKA.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
High Temp (^{o}F)	61	65	71	77	84	89	91	90	87	80	71	63
Low Temp (^{o}F)	39	41	47	53	61	68	71	71	67	55	47	41
Precip. (in)	6.1	5.1	6.9	4.5	5	5.4	8.4	6.7	6.4	3.7	5.5	4.2

Source: www.intellicast.com

2.4. Pavement Network Definition

A key element in developing an APMP system is defining the pavement network, which is the process of dividing an agency's pavements into a hierarchical order that facilitates inspection and M&R planning. The JKA network (e.g. all airside pavements) is then divided into branches, which are a readily identifiable part of the pavement system and have distinct functions. For airports, branches typically consist of individual runways, taxiways and aprons. Figure B1A in Appendix B shows the branches at JKA.

Once branches have been defined, pavement evaluation and analysis techniques require the airfield pavement system to be broken up into discrete sections. A pavement "section" is the smallest management unit that is used when considering the application and selection of maintenance and rehabilitation (M&R) treatments, and is defined in Section 2.1.8 of ASTM D 5340-12 as *"a contiguous pavement area having uniform construction, maintenance, usage history, and condition. A section should also have the same traffic volume and load intensity."* A complete list of the pavement inventory and the corresponding section designations are included in Appendix A. Figure B1B presents the section layout.

To facilitate the visual survey of the airside pavement, each section is further subdivided into conveniently defined sub-section areas, or sample units. Similar sizing is critical as studies have found that maintaining the size of the sample units to within 40 percent of the established norm may reduce the standard error of the average PCI values. To meet that criteria, ASTM recommends that sample units for asphalt pavements be 5,000 square feet (± 2,000).

Table 2.2 was used as a guideline in developing sampling rates that reflect typical rates that are used for other large pavement networks. In general, this sampling rate will not provide a 95% confidence level with a standard error of 5 PCI points. A higher level of sampling is recommended before a project-level rehabilitation design is developed for a pavement section or facility.

Sample units that include a one-time occurrence of a distress (i.e. a large patch) or an unusual severity or quantity of a distress seen elsewhere, were designated as "additional" sample units as described in the ASTM D5340 PCI procedure. This allows the PCI to be calculated without extrapolating the aberrant distress throughout the section as a whole. In Appendix B, Figure B1C shows the sample unit layout for JKA.

Table 2.2: PCI Sampling Rate for AC Surfaces.

Total Samples	Samples to Inspect
1	1
2	2
3 – 6	3
7 – 13	4
14 – 39	5
> 39	15 percent, but less than 12

2.5. Inventory Summary

There are 23 branches (facilities) at JKA that include 37 pavement sections and a total area of approximately 2.65 million square feet of paved surfaces, as shown in Table 2.3.

Table 2.3: JKA Pavement Branches.

Branch ID	Branch Name	Branch Use	Area, sf	Number of Sections
A01	Apron 01	APRON	425,345	3
A02	Apron 02	APRON	16,338	1
A03	Apron 03	APRON	58,994	2
A04	Apron 04	APRON	55,884	1
R0927	Runway 09-27	RUNWAY	696,200	2
R1735	Runway 17-35	RUNWAY	262,239	4
T01	Taxiway 01	TAXIWAY	38,560	1
TA	Taxiway A	TAXIWAY	363,397	4
TA1	Taxiway A1	TAXIWAY	21,221	1
TA2	Taxiway A2 01	TAXIWAY	27,287	1
TA3	Taxiway A3	TAXIWAY	27,301	1
TA4	Taxiway A4	TAXIWAY	27,286	1
TA5	Taxiway A5	TAXIWAY	12,855	1
TC	Taxiway C	TAXIWAY	67,552	2
TC01	Taxiway Connector 01	TAXIWAY	8,460	1

Branch ID	Branch Name	Branch Use	Area, sf	Number of Sections
TC02	Taxiway Connector 02	TAXIWAY	8,043	1
TC1	Taxiway C1	TAXIWAY	13,579	2
TC2	Taxiway C2	TAXIWAY	10,296	1
TE	Taxiway E	TAXIWAY	75,147	1
TE1	Taxiway E1	TAXIWAY	8,867	1
TF	Taxiway F	TAXIWAY	61,071	2
THANG01	Taxiway Hangar 01	TAXIWAY	114,229	1
THANG02	Taxiway Hangar 02	TAXIWAY	248,023	2
		Total	**2,648,174**	**37**

Table 2.4 shows the distribution of airfield pavement by age with the area-weighted age being 16 years for all airside pavements at JKA.

Table 2.4: JKA Pavement Age.

Age (Years)	Number of Sections	Percent of Area	Area, sf
0 – 5	0	0	0
6 – 10	18	33	884,876
11 – 15	5	8	198,480
16 – 20	13	55	1,450,589
> 20	1	4	114,229

Figure 2.2 shows the distribution by surface type. Figure 2.3 presents the distribution by pavement use (e.g. runway, taxiway, and apron).

Figure 2.2: JKA Pavement Area by Surface Type.

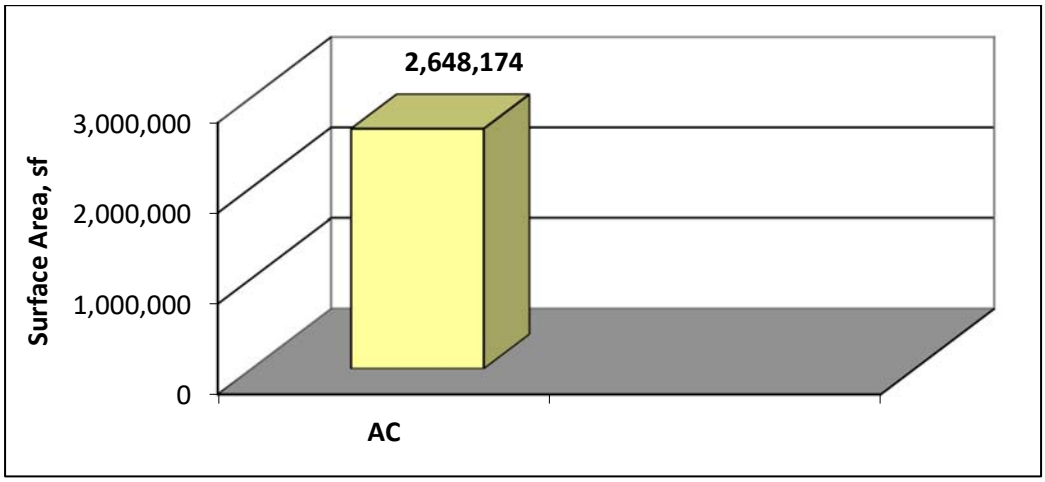
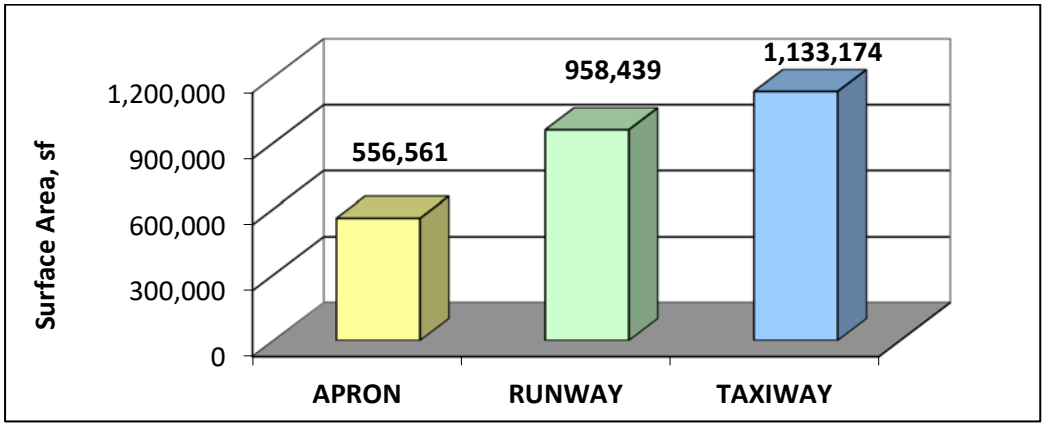


Figure 2.3: JKA Pavement Area by Branch Use.



Maps B1D, B1E, and B1F show the pavement type, branch use, and pavement age, respectively.

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3 Pavement Condition

3.1. Introduction

A visual PCI survey of the airside pavements at JKA was conducted in order to assist in the development of a realistic PCIP. The PCI survey measures and records pavement distresses that exist within each of the inspected sample units. This survey was conducted in November 2019 by a 2-person team. The survey was performed in accordance with the methods described in ASTM D 5340-12 and FAA AC 150/5380-7B, using the sampling rates from Chapter 2 of this API report.

During the pavement survey, Quality Control (QC) and data verification were performed on both the individual distresses and the calculated section PCI values. QC included the following activities;

- Review of distress quantities to identify data entry errors (100% review at the sample unit level). General guidance was used from ASTM D5340-12, section 13, which addresses the precision of distress quantities that are recorded during PCI surveys.
- Duplicate surveys were performed to ensure consistency between each of the inspectors in a 2-person PCI survey team.

3.2. Pavement Condition Rating Methodology

The PCI is a measure of the pavement's functional surface condition. It provides insight into the causes of each distress, and whether the distress is primarily caused by load, climatic conditions, and other material related deficiencies. The PCI is a numerical rating (on a scale of 0 to 100) that is based on the type, severity and quantity of each distress that is found in an inspected sample unit.

The PCI survey results are displayed using seven categories and ratings in accordance with the ASTM, but can also be presented using a simplified 3-category rating system for use in comparing with other distress related indices, as shown in Table 3.1.

Table 3.1: Pavement Condition Index Rating Scale.

	Simplified PCI Color Legend	ASTM PCI Color Legend	PCI Range	PCI Ratings and Definition
GOOD			86-100	GOOD: Pavement has minor or no distresses and should require only routine maintenance.
			71-85	SATISFACTORY: Pavement has scattered low-severity distresses that should require only routine maintenance.
FAIR			56-70	FAIR: Pavement has a combination of generally low- and medium-severity distresses. Near-term maintenance and repair needs may range from routine to major.
POOR			41-55	POOR: Pavement has low-, medium-, and high-severity distresses that probably cause some operational problems. Near-term M&R needs range from routine to major. requirement for
			26-40	VERY POOR: Pavement has predominantly medium- and high-severity distresses that cause considerable maintenance & operational problems. Near-term M&R needs will be major.
			11-25	SERIOUS: Pavement has mainly high-severity distresses that cause operational restrictions; immediate repairs are needed.
			0-10	FAILED: Pavement deterioration has progressed to the point that safe aircraft operations are no longer possible; complete reconstruction is required.

3.3. Distress Types

The ASTM D5340 standard considers 17 distresses, which tend to fall into one of the following four cause categories:

- Load related: AC distresses include alligator cracking, corrugation, depression, polished aggregate, rutting and slippage cracking; PCC distresses include corner breaks, longitudinal cracking, divided slabs, polished aggregate, pumping and joint spalling.
- Climate and durability related: AC distresses include bleeding, block cracking, joint reflection cracking, longitudinal and transverse (L&T) cracking, swelling, raveling, and weathering; PCC distresses include blow-ups, "D" cracking, longitudinal cracking, pop-outs, pumping, scaling, shrinkage cracks, and joint and corner spalling.
- Moisture & Drainage related: AC distresses include alligator cracking, depressions, potholes and swelling; PCC distresses include corner breaks, divided slabs and pumping.
- Other factors: Oil spillage, jet blast erosion, bleeding, patching and concrete slab joint faulting.

As described above, distress may have more than one cause. For example, depressions may be caused by incorrect compaction during construction, or by subgrade softening due to environmental factors. In addition, a distress may be initiated by one cause but may progress to a distress of higher severity by another cause. Therefore, engineering judgment is critical in analyzing the actual causes of the distress.

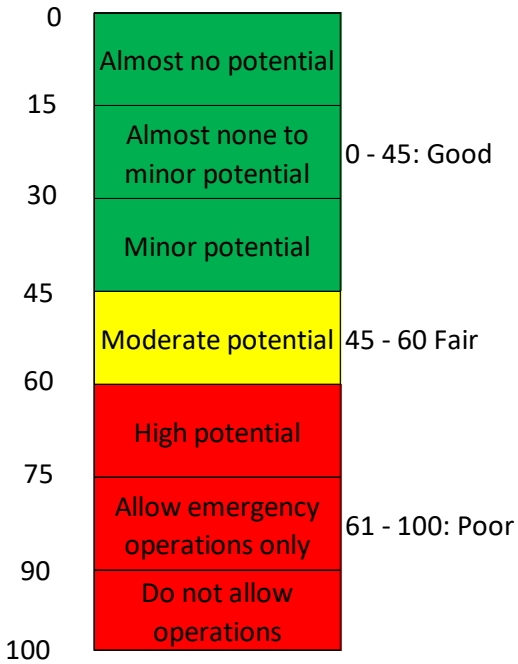
Distress descriptions provided in Appendix C were taken from the "PCI Field Manual," developed by the U.S. Army Construction Engineering Research Lab (CERL), latest edition. Appendix C provides a detailed explanation of each type of AC and PCC surface distress.

3.4. Additional PCI-based Indices

The distress data used to compute PCI can also be used to calculate additional indices that are helpful in understanding the condition of the pavement and developing PCIP recommendations. One additional index that was computed is the Foreign Object Damage (FOD) potential index.

The FOD index was developed by the US Air Force and is described in detail in the US Army Corp of Engineers Engineering Technical Letter (ETL) 04-09, Pavement Engineering Assessment (EA) Standards. Loose objects on an airfield pavement surface resulting from pavement distresses can be detrimental to aircraft engines, specifically engines that are low to the ground. The objects are ingested into the engines causing costly damage and presenting a safety hazard. Not all pavement distresses create a FOD potential. Therefore, an additional index was identified that uses the results of the PCI distress survey. As shown in Figure 3.1, the scale ranges from 0 to 100 with 0 being no FOD potential. Note that the FOD index uses a simplified three color scale.

Figure 3.1: FOD Potential Rating Scale.



3.5. PCI Survey Results

The airside pavements at JKA include 37 sections with 537 sample units. The sample number of sample units that were surveyed in the field is 173, which is 32 percent of the total samples. Data from the inspected sample units were input into the PAVER database and a resultant PCI for each section was computed.

Figure 3.2 presents the area-weighted PCI by use and the overall airside network.

Figure 3.2: Pavement Condition by Branch Use.

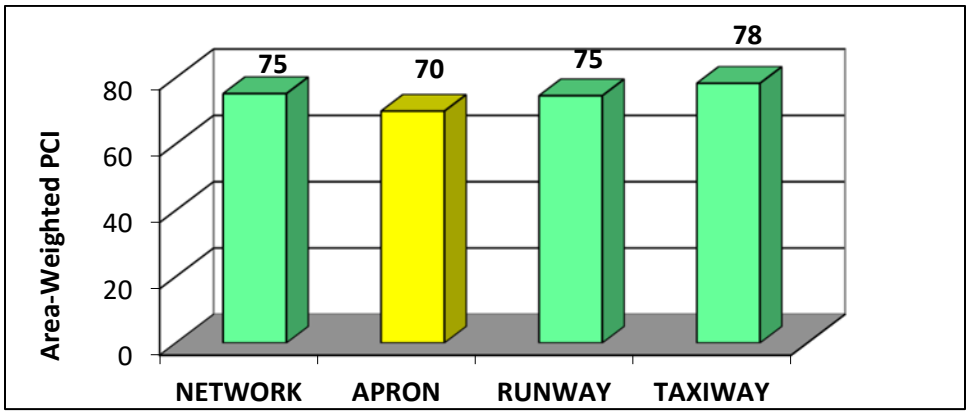


Figure 3.3 shows the distribution of the JKA pavement network by condition. None of the network is in "Poor" or worse condition.

Figure 3.3: Pavement Condition by Percent of Area.

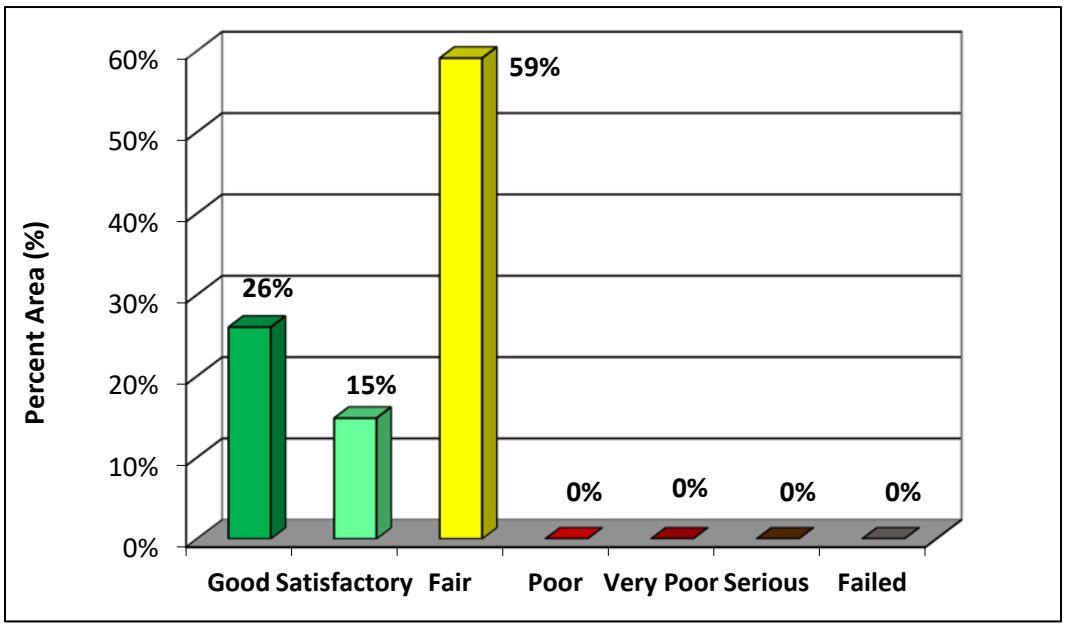


Table 3.2 is a listing of the section PCI.

Table 3.2: Section PCI.

Branch ID	Name	Section ID	Surface	Area, sf	PCI	PCI Category	FOD
A01	Apron 01	01	AC	163,970	63	Fair	51
A01	Apron 01	02	AC	146,625	66	Fair	48
A01	Apron 01	03	AC	114,750	70	Fair	43
A02	Apron 02	01	AC	16,338	61	Fair	53
A03	Apron 03	01	AC	4,696	72	Satisfactory	41
A03	Apron 03	02	AC	54,298	84	Satisfactory	26
A04	Apron 04	01	AC	55,884	89	Good	21
R0927	Runway 09-27	01	AC	46,900	80	Satisfactory	32
R0927	Runway 09-27	02	AC	649,300	69	Fair	44
R1735	Runway 17-35	01	AC	62,550	85	Satisfactory	26
R1735	Runway 17-35	02	AC	15,000	65	Fair	49
R1735	Runway 17-35	03	AC	15,039	68	Fair	46
R1735	Runway 17-35	04	AC	169,650	92	Good	18
T01	Taxiway 01	01	AC	38,560	59	Fair	55
TA	Taxiway A	01	AC	42,086	72	Satisfactory	41
TA	Taxiway A	02	AC	16,651	83	Satisfactory	28
TA	Taxiway A	03	AC	14,853	84	Satisfactory	27
TA	Taxiway A	04	AC	289,807	67	Fair	46
TA1	Taxiway A1	01	AC	21,221	68	Fair	46
TA2	Taxiway A2 01	01	AC	27,287	65	Fair	49
TA3	Taxiway A3	01	AC	27,301	63	Fair	51
TA4	Taxiway A4	01	AC	27,286	68	Fair	46
TA5	Taxiway A5	01	AC	12,855	61	Fair	53
TC	Taxiway C	01	AC	28,905	72	Satisfactory	40
TC	Taxiway C	02	AC	38,647	99	Good	10
TC01	Taxiway Connector 01	01	AC	8,460	92	Good	18
TC02	Taxiway Connector 02	01	AC	8,043	72	Satisfactory	41
TC1	Taxiway C1	01	AC	7,029	88	Good	22
TC1	Taxiway C1	02	AC	6,550	90	Good	20
TC2	Taxiway C2	01	AC	10,296	89	Good	21
TE	Taxiway E	01	AC	75,147	88	Good	22
TE1	Taxiway E1	01	AC	8,867	91	Good	19
TF	Taxiway F	01	AC	49,007	88	Good	22
TF	Taxiway F	02	AC	12,064	89	Good	21
THANG01	Taxiway Hangar 01	01	AC	114,229	75	Satisfactory	33
THANG02	Taxiway Hangar 02	01	AC	160,823	94	Good	15
THANG02	Taxiway Hangar 02	02	AC	87,200	91	Good	19

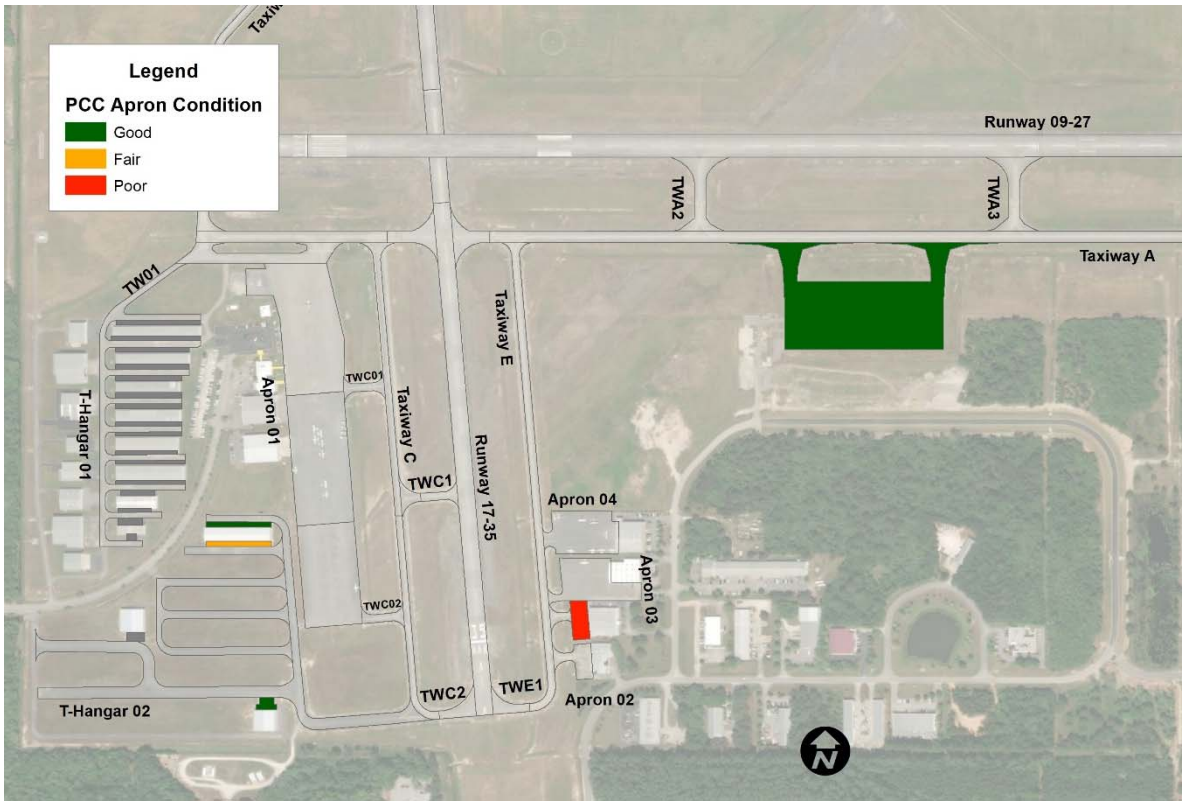
Figure B2A and B2B in Appendix B are maps of the section PCI in 7- and 3-scale categories, respectively. Figures B2C is a map of the FOD rating. Appendix D contains a detailed report of the PCI values and distress type, quantity, and severity data for each sample unit that was surveyed in a section. Appendix E is a summary report of the extrapolated distress data at the section level.

Appendix F contains current section and branch PCI data and forecasted section PCI values. FOD values by section and branch are also presented. Figure B2D in Appendix B shows the locations of the photos that were taken during the survey. Photos are included in Appendix J.

3.6. PCC Pavements

As stated earlier, the project scope did not include a detailed pavement condition survey for any Portland Cement Concrete (PCC) aprons. For these pavements, a rating of "Good", "Fair", or "Poor" was assigned based on the overall pavement condition. Figure 3.4 shows the condition of the PCC aprons at CQF.

Figure 3.4: PCC Apron Condition Rating.



4 Pavement Capital Improvement Program

4.1. Introduction

PCI data were collected and entered into the PAVER database. In addition, the database customization included the following components, which are described in detail in this chapter.

1. Performance Modeling
2. Maintenance & Repair (M&R) Triggers (Critical PCI)
3. M&R Policies
4. Unit Costs

Once the database was customized, it was used to run budget analysis scenarios and develop a 7-year PCIP.

4.2. Performance Modeling

To determine long-term M&R needs, a APMP must be able to predict future pavement condition. Future pavement condition is predicted using equation models that are generated from current and historical PCI data. Equation models are developed by grouping pavements based on similar performance characteristics such as region, construction history, surface type, traffic, priority and use. Mathematical techniques such as straight-line extrapolation and regression that include boundary and outlier filters are used to develop models that provide the best fit equation for the pavement condition data. PAVER's Prediction Modeling module was used to develop pavement performance models that are commonly referred to as 'Family Curves'.

Prediction models are used at the section level to compute future conditions based on the typical performance of the pavement sections that are included in each model. Future condition is computed by defining its position relative to the prediction model. The section prediction curve, or equation, is drawn through the current PCI-age point for each specific section. Since the shifted curve will run parallel to the computed prediction model, the predicted condition can be computed for any future age. Figure 4.1 is an illustration of this process.

Prediction models provide an effective way to compute future pavement performance based on past and current conditions, and pavement maintenance and rehabilitation practices. As new PCI inspection surveys are conducted, these models should be updated accordingly. In the case of the Alabama statewide airport pavement network, the best fit family curves were developed for each region by grouping pavements according to branch use (e.g. runway, taxiway) and surface type (e.g. AC, AAC, and APC). The family curves for ALDOT were developed based on branch use and are presented in Figure 4.2.

Figure 4.1: PCI Forecasting.

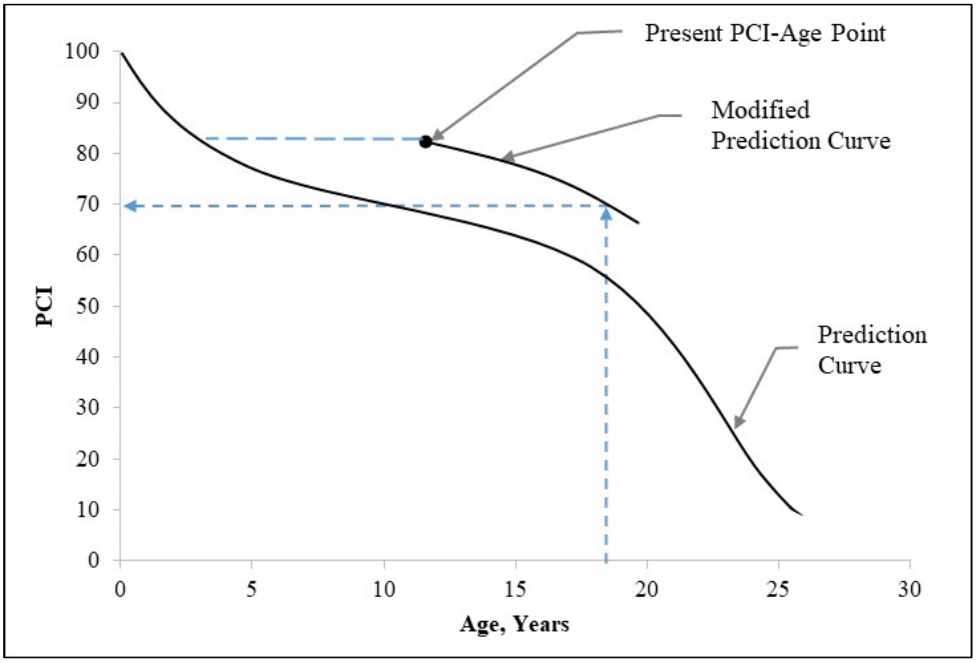
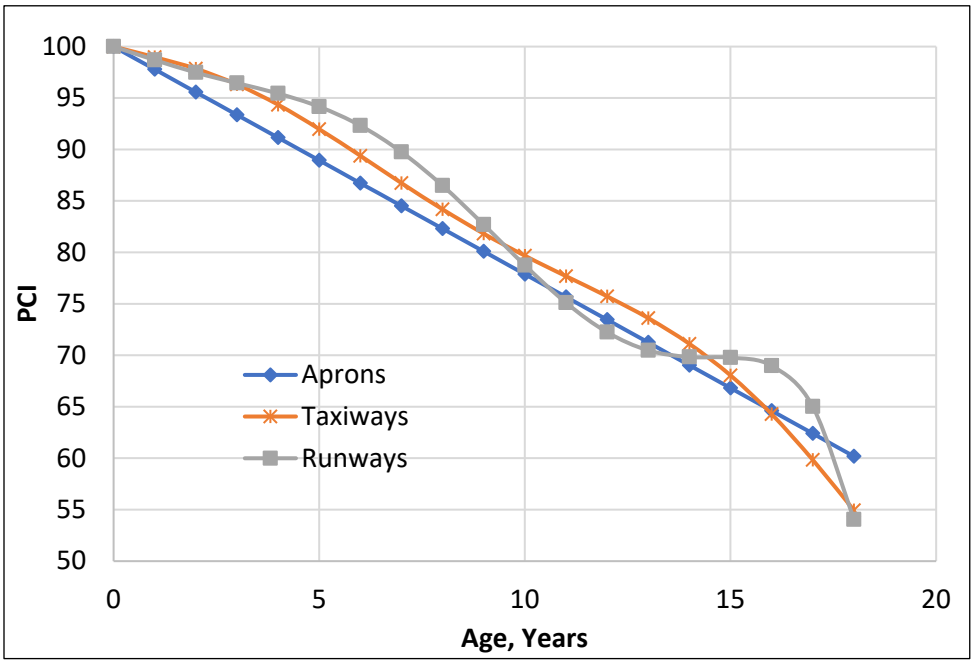


Figure 4.2: Family Curves.



4.3. Critical PCI Values

The Critical PCI value is defined as "*the PCI value at which the rate of PCI loss increases with time, or the cost of applying localized preventive maintenance increases significantly*." This definition is incorporated into PAVER in defining and measuring the critical PCI values. These values, or M&R triggers, are assigned for each prediction model. As such, the critical PCI values are directly related to the branch use.

These critical PCI levels are selected based on several factors including a review of performance models; experience; other airport triggers; and acknowledge that time is required for funding approval and design. Note that preventive maintenance is recommended, and it should generally be performed above the critical PCI (trigger) values and Major M&R is generally performed below them. The critical PCI (CP) values were set at 70 for runways and taxiways, and 65 for other pavements.

4.4. M&R Policies and Unit Costs

M&R policies refer to the activities that are applied at different condition levels to maintain and repair a pavement section.

Maintenance activities are localized activities which are typically assigned in the first year of the M&R plan based on the observed distresses. Safety (stopgap) maintenance addresses distresses that would affect operational safety if left unrepaired and is applied to pavements below the critical PCI. Preventive maintenance activities are aimed at slowing the rate of deterioration through consistent maintenance of existing pavements and are generally applied to pavements above the critical PCI. Appendix G presents the policies for preventive and safety maintenance.

Repair activities are conducted for larger areas, typically at the section level and are assigned based on the critical PCI. Repair activities broadly consist of three categories: preservation, rehabilitation, and reconstruction. Pavement preservation involves activities like surface treatments that are used to extend pavement service life and to delay more expensive rehabilitation work. These are applied when the pavement is in relatively good condition and does not exhibit any structural distress. Rehabilitation activities are used to repair pavements below or around the critical PCI and typically include mill and overlay. Reconstruction is recommended when the pavement has deteriorated to a level where rehabilitation is no longer cost effective.

Table 4.1 lists the pavement activity types, the individual activities within each type, and their associated 2020 unit costs. A more detailed description of the M&R activities and the development of the M&R unit costs is presented in Appendix H.

In accordance with ALDOT's focus on preservation, surface treatment is applied to all resurfaced and reconstructed runways, taxiways, and aprons three years after construction work is complete. Taxilanes and T-Hangar pavements are excluded from this requirement. This policy is applicable for projects in the PCIP between 2021 and 2024. For cost estimating, this surface treatment is assumed to have the same cost as the runway surface treatment.

Table 4.1: M&R Activities and Unit Costs.

Activity Type	PCI	Activity	Cost/sf
Maintenance	Note 1	Seal Cracks – AC ($/lf)	$3.95
		AC Full-Depth Patching	$25.05
		AC Partial-Depth Patching	$16.28
Preservation	75-90	Runway Surface Treatment	$0.57
		Taxiway and Apron Surface Treatment	$0.85
Rehabilitation	> CP	2" AC OL[2]	$3.91
	55 - CP	Mill 2" & 2" AC OL	$4.27
	45 - 55	Mill 2" & 2" AC OLP (With Pre-Overlay Repairs)	$5.37
Reconstruction	0 - 45	AC Reconstruction	$9.87

[1] Preventive > CP; Safety (Stopgap) < CP

[2] For sections with structural distress and PCI > CP

4.5. Pavement CIP Development

The PAVER database, updated with condition data and customized with condition performance priorities, policies, and costs; was used to evaluate the effect of multiple funding levels on the overall future pavement condition. This output was further used to develop the PCIP. Figure 4.3 illustrates the process that PAVER uses in the funding analysis.

The following M&R funding levels were used for the JKA pavement network to help establish the 7-Year PCIP. Figure 4.4 presents the network area-weighted average PCI for each of the following funding scenarios at the end of the analysis period:

- Unlimited Funding: Unlimited funding is available for all pavement needs. The PCI increases to 87 by 2027.
- Maintain PCI: Maintain existing PCI of 75.
- Constrained Funding: This scenario constrains the funding to $1 million each year (total of $7 million). The PCI decreases to 65 in 2027.
- Do Nothing: Performing no M&R would reduce the network PCI from 75 to 50 by 2027.

Figure 4.3: Budget Analysis Process.

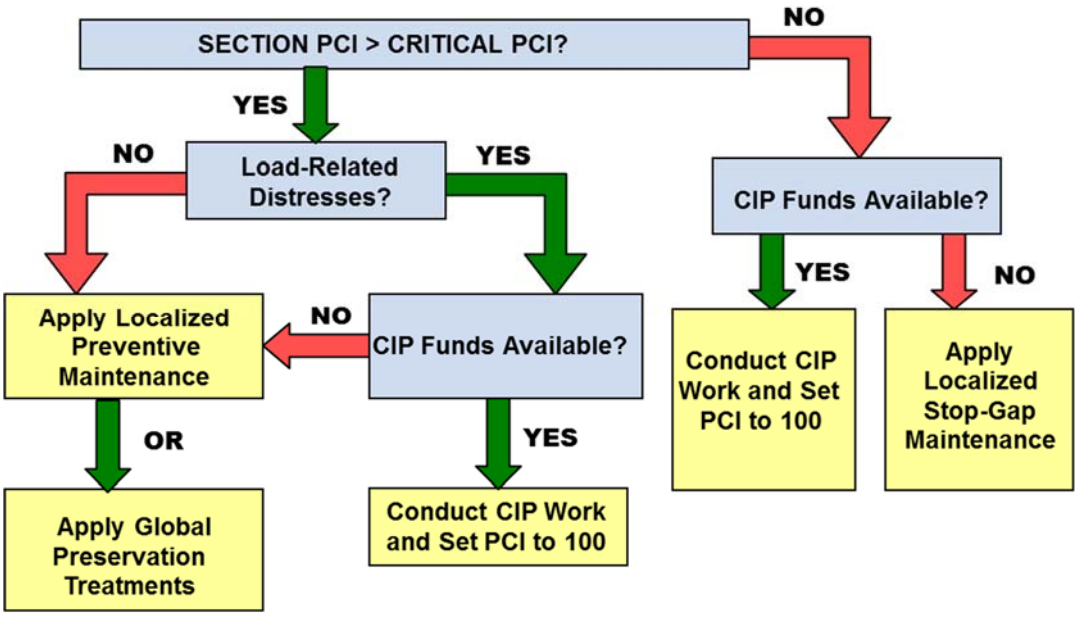


Figure 4.4: M&R Funding Levels.

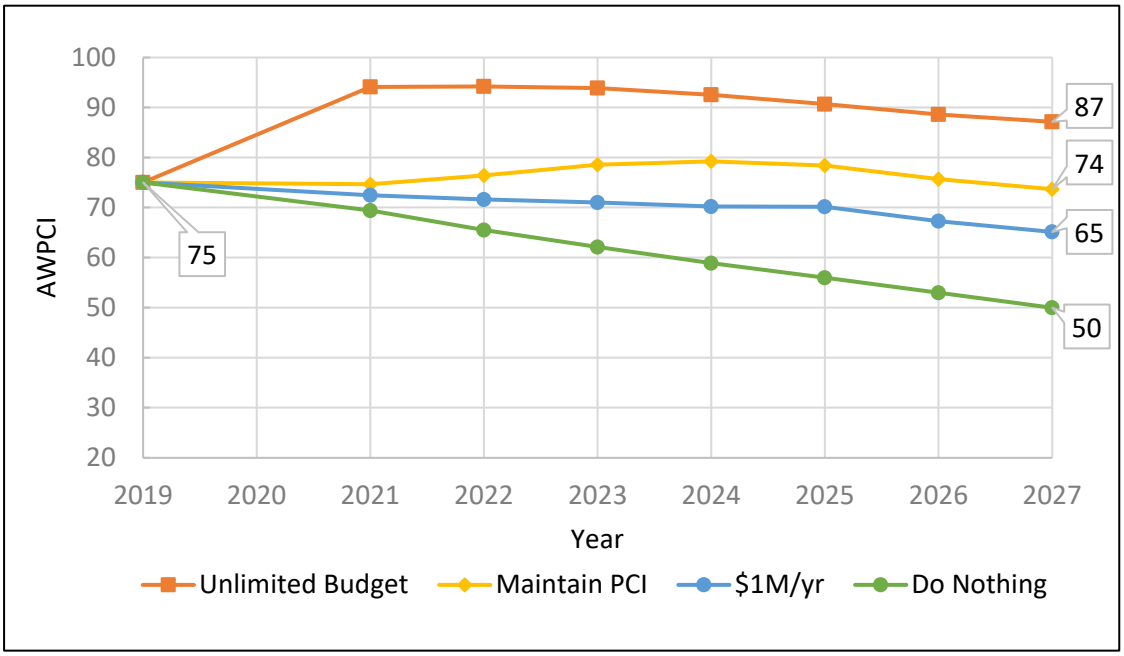


Table 4.2 summarizes the annual funding required for the above analyses. For the unlimited analysis, all pavement needs are funded in the year they are required. Therefore, the unfunded costs are zero. The total funded amount over the 7-year period is approximately $9.1 million. For the annual funding level of $1 million per year, funding is prioritized based on the prioritization matrix. When the needs exceed the funding for any year, the remaining sections are transferred to the succeeding year and the amount

for these activities are represented as “unfunded”. The “unfunded” repairs in 2027 for this funding level is approximately $12.5 million.

Table 4.2: Summary of M&R Funding Level Analyses.

Year	Unlimited	Maintain PCI	Constrained $1M/year	Do Nothing
2021	$7,130,000	$1,607,000	$977,000	$0
2022	$664,000	$1,606,000	$908,000	$0
2023	$556,000	$1,588,000	$903,000	$0
2024	$241,000	$1,168,000	$811,000	$0
2025	$66,000	$704,000	$922,000	$0
2026	$36,000	$100,000	$116,000	$0
2027	$360,000	$482,000	$510,000	$0
Total	**$9,052,000**	**$7,255,000**	**$5,146,000**	**$0**
2027 Backlog	**-**	**$7,652,000**	**$12,451,000**	**$20,240,000**

Map B3A in Appendix B presents the 2027 forecasted PCI by section when the M&R activities recommended in the CIP are not conducted.

4.6. Pavement Capital Improvement Program

The unlimited funding analysis contains rehabilitation activities for sections from the same branch spread out over the seven-year period, which is not always operationally feasible to construct. The analysis output was treated as a starting point in developing the CIP. Sections were often integrated together to account for construction feasibility and other factors, resulting in larger projects which were more realistic. In addition, each project could contain sections whose condition did not trigger rehabilitation but were included to provide a logical plan which would avoid creating “islands” of newer pavement within a particular feature. For example, if the PAVER analysis showed rehabilitation was required for eight out of 10 sections on a runway, the entire runway would be recommended for rehabilitation to provide a continuous new pavement surface.

Table 4.3 shows the projects and the associated costs for the recommended 7-year PCIP. Table 4.4 is a more detailed view of the PCIP. This table lists the individual pavement section, section level M&R work, section repair cost, surface area and the PCI before the M&R is applied. The costs that are presented represent an annual escalation rate of 3% for the unit costs. The total 7-year PCIP cost is approximately $10.1 million. Map B3B shows the recommended repair types, while Map B3C presents the recommended projects and activities in the PCIP. Appendix I1 presents a summary of the recommended activities and cost by year for each section at JKA.

Table 4.3: Summary of 7-Year PCIP by Project.

Project Year	CIP Project	Total Project Cost	Total Project Area, sf	AWPCI Before	AWPCI After
2021	JKA_21-01_Runway 17-35 Preservation	$196,389	301,960	85	91
	JKA_21-02_Taxiway E Preservation	$65,872	75,147	84	92
	JKA_21-03_Taxiway F Preservation	$42,959	49,007	84	92
	JKA_21-04_Taxiway C Preservation	$47,035	53,657	94	98
	JKA_21-05_Aprons 03 & 04 Preservation	$96,583	110,182	83	90
	JKA_21-06_Taxiway Hangar 02 Preservation	$217,412	248,023	89	96
	JKA_21-07_Runway 09-27 Rehabilitation	$3,734,321	842,189	60	100
2022	JKA_22-01_Taxiway A Rehabilitation	$1,722,529	370,453	56	100
2023	JKA_23-01_Apron 01 Rehabilitation	$2,156,331	462,293	58	100
	JKA_23-02_Aprons 02 & 03 Rehabilitation	$117,710	21,034	56	100
2024	JKA_24-01_Taxiway Hangar 01 Rehabilitation	$548,797	114,229	60	100
	JKA_24-02_Runway 09-27 Surface Treatment	$535,996	842,189	96	99
2025	JKA_25-01_Taxiway A Surface Treatment	$242,841	370,453	96	99
2026	JKA_26-01_Apron 01 Surface Treatment	$312,136	462,293	94	98
	JKA_26-02_Aprons 02 & 03 Surface Treatment	$14,202	21,034	93	98
	Total	**$10,051,113**			

Table 4.4: Summary of 7-Year PCIP by Project and Section.

Branch	Section	Area, sf	PCI Before Rehab	Activity	Activity Type	Cost
JKA_21-01_Runway 17-35 Preservation						**$196,389**
R1735	01	62,550	80	Runway Surface Treatment	Preservation	$36,431
R1735	04	169,650	89	Runway Surface Treatment	Preservation	$98,808
TA	02	16,651	80	Taxiway & Apron Surface Treatment	Preservation	$14,596
TA	03	14,853	81	Taxiway & Apron Surface Treatment	Preservation	$13,020
TC1	01	7,029	85	Taxiway & Apron Surface Treatment	Preservation	$6,161
TC2	01	10,296	86	Taxiway & Apron Surface Treatment	Preservation	$9,025
TE1	01	8,867	88	Taxiway & Apron Surface Treatment	Preservation	$7,773
TF	02	12,064	86	Taxiway & Apron Surface Treatment	Preservation	$10,575
JKA_21-02_Taxiway E Preservation						**$65,872**
TE	01	75,147	85	Taxiway & Apron Surface Treatment	Preservation	$65,872
JKA_21-03_Taxiway F Preservation						**$42,959**
TF	01	49,007	85	Taxiway & Apron Surface Treatment	Preservation	$42,959
JKA_21-04_Taxiway C Preservation						**$47,035**
TC	02	38,647	98	Taxiway & Apron Surface Treatment	Preservation	$33,877
TC01	01	8,460	89	Taxiway & Apron Surface Treatment	Preservation	$7,416
TC1	02	6,550	87	Taxiway & Apron Surface Treatment	Preservation	$5,742

Branch	Section	Area, sf	PCI Before Rehab	Activity	Activity Type	Cost
JKA_21-05_Aprons 03 & 04 Preservation						**$96,583**
A03	02	54,298	81	Taxiway & Apron Surface Treatment	Preservation	$47,597
A04	01	55,884	86	Taxiway & Apron Surface Treatment	Preservation	$48,987
JKA_21-06_Taxiway Hangar 02 Preservation						**$217,412**
THANG02	01	160,823	91	Taxiway & Apron Surface Treatment	Preservation	$140,974
THANG02	02	87,200	88	Taxiway & Apron Surface Treatment	Preservation	$76,438
JKA_21-07_Runway 09-27 Rehabilitation						**$3,734,321**
R0927	01	46,900	76	Mill 2" & 2" AC OL	Rehabilitation	$206,204
R0927	02	649,300	64	Mill 2" & 2" AC OL	Rehabilitation	$2,854,756
R1735	02	15,000	55	Mill 2" & 2" AC OLP	Rehabilitation	$82,911
R1735	03	15,039	60	Mill 2" & 2" AC OL	Rehabilitation	$66,121
TA1	01	21,221	64	Mill 2" & 2" AC OL	Rehabilitation	$93,302
TA2	01	27,287	60	Mill 2" & 2" AC OL	Rehabilitation	$119,972
TA3	01	27,301	58	Mill 2" & 2" AC OL	Rehabilitation	$120,033
TA4	01	27,286	64	Mill 2" & 2" AC OL	Rehabilitation	$119,967
TA5	01	12,855	55	Mill 2" & 2" AC OLP	Rehabilitation	$71,054
JKA_22-01_Taxiway A Rehabilitation						**$1,722,529**
T01	01	38,560	49	Mill 2" & 2" AC OLP	Rehabilitation	$219,530
TA	01	42,086	65	Mill 2" & 2" AC OL	Rehabilitation	$190,589
TA	04	289,807	58	Mill 2" & 2" AC OL	Rehabilitation	$1,312,411
JKA_23-01_Apron 01 Rehabilitation						**$2,156,331**
A01	01	163,970	56	Mill 2" & 2" AC OL	Rehabilitation	$764,826
A01	02	146,625	59	Mill 2" & 2" AC OL	Rehabilitation	$683,921
A01	03	114,750	63	Mill 2" & 2" AC OL	Rehabilitation	$535,243
TC	01	28,905	61	Mill 2" & 2" AC OL	Rehabilitation	$134,825
TC02	01	8,043	61	Mill 2" & 2" AC OL	Rehabilitation	$37,516
JKA_23-02_Aprons 02 & 03 Rehabilitation						**$117,710**
A02	01	16,338	54	Mill 2" & 2" AC OLP	Rehabilitation	$95,806
A03	01	4,696	65	Mill 2" & 2" AC OL	Rehabilitation	$21,904
JKA_24-01_Taxiway Hangar 01 Rehabilitation						**$548,797**
THANG01	01	114,229	62	Mill 2" & 2" AC OL	Rehabilitation	$548,797
JKA_24-02_Runway 09-27 Surface Treatment						**$535,996**
R0927	01	46,900	-	Surface Treatment	Preservation	$29,849
R0927	02	649,300	-	Surface Treatment	Preservation	$413,235
R1735	02	15,000	-	Surface Treatment	Preservation	$9,546
R1735	03	15,039	-	Surface Treatment	Preservation	$9,571
TA1	01	21,221	-	Surface Treatment	Preservation	$13,506
TA2	01	27,287	-	Surface Treatment	Preservation	$17,366

Branch	Section	Area, sf	PCI Before Rehab	Activity	Activity Type	Cost
TA3	01	27,301	-	Surface Treatment	Preservation	$17,375
TA4	01	27,286	-	Surface Treatment	Preservation	$17,366
TA5	01	12,855	-	Surface Treatment	Preservation	$8,181
JKA_25-01_Taxiway A Surface Treatment						**$242,841**
T01	01	38,560	-	Surface Treatment	Preservation	$25,277
TA	01	42,086	-	Surface Treatment	Preservation	$27,588
TA	04	289,807	-	Surface Treatment	Preservation	$189,976
JKA_26-01_Apron 01 Surface Treatment						**$312,136**
A01	01	163,970	-	Surface Treatment	Preservation	$110,711
A01	02	146,625	-	Surface Treatment	Preservation	$99,000
A01	03	114,750	-	Surface Treatment	Preservation	$77,478
TC	01	28,905	-	Surface Treatment	Preservation	$19,516
TC02	01	8,043	-	Surface Treatment	Preservation	$5,431
JKA_26-02_Aprons 02 & 03 Surface Treatment						**$14,202**
A02	01	16,338	-	Surface Treatment	Preservation	$11,031
A03	01	4,696	-	Surface Treatment	Preservation	$3,171
					Total	**$10,051,113**

The FAA, under the Airport Improvement Program (AIP) provides approximately 90 percent of eligible costs for planning and development of public-use airports included in the NPIAS as grants. The remaining 10 percent of costs are shared between ALDOT and the airport sponsor. The following is the distribution of the 7-yr PCIP cost of $10.1 million for JKA:

- FAA (90%): $9.1 million
- ALDOT (5%): $0.5 million
- Airport Sponsor (5%): $0.5 million

The recommendations within the PCIP are based on a network-level study and should be used for planning purposes only. A detailed project-level assessment should be conducted for each project to determine the appropriate repair activities and develop more accurate cost estimates.

Table 4.5 summarizes the maintenance activities that are recommended for Year 1 (2021). The estimated cost is approximately $81,757. A complete listing of the maintenance activities by section is presented in Appendix I2. This may be used as a basis for establishing an annual maintenance budget for the JKA pavements.

Table 4.5: Summary of Year-1 Maintenance Plan.

Policy	Work Description	Work Quantity	Work Unit	Work Cost
Preventive	Crack Sealing - AC	12,140	Ft	$47,955
	Patching - AC Full-Depth	1,349	SqFt	$33,802
			Total	**$81,757**

APPENDIX A

INVENTORY

Appendix A

Pavement Inventory Report

Jack Edwards National Airport (JKA)

Branch ID	Name	Branch Use	Section ID	Rank[1]	Length (ft)	Width (ft)	Area (sf)	LCD[2]	Surface[3]
A01	Apron 01 Gulf Shores	APRON	01	S	575	255	163,970	2/11/2003	AC
A01	Apron 01 Gulf Shores	APRON	02	S	575	255	146,625	6/20/2004	AC
A01	Apron 01 Gulf Shores	APRON	03	S	450	255	114,750	4/12/2006	AC
A02	Apron 02 Gulf Shores	APRON	01	S	130	75	16,338	3/18/2002	AC
A03	Apron 03 Gulf Shores	APRON	01	S	93	35	4,696	3/8/2007	AC
A03	Apron 03 Gulf Shores	APRON	02	S	225	200	54,298	8/10/2012	AC
A04	Apron 04 Gulf Shores	APRON	01	S	290	180	55,884	11/14/2014	AC
R0927	Runway 09-27 Gulf Shores	RUNWAY	01	P	469	100	46,900	3/1/2010	AC
R0927	Runway 09-27 Gulf Shores	RUNWAY	02	P	6,493	100	649,300	11/8/2003	AC
R1735	Runway 17-35 Gulf Shores	RUNWAY	01	P	834	75	62,550	1/2/2013	AC
R1735	Runway 17-35 Gulf Shores	RUNWAY	02	P	200	75	15,000	11/3/2002	AC
R1735	Runway 17-35 Gulf Shores	RUNWAY	03	P	200	75	15,039	6/16/2003	AC
R1735	Runway 17-35 Gulf Shores	RUNWAY	04	P	2,262	75	169,650	1/2/2013	AC
T01	Taxiway 01 Gulf Shores	TAXIWAY	01	S	365	40	38,560	9/1/2002	AC
TA	Taxiway A Gulf Shores	TAXIWAY	01	P	842	50	42,086	3/6/2006	AC
TA	Taxiway A Gulf Shores	TAXIWAY	02	P	215	50	16,651	1/1/2013	AC
TA	Taxiway A Gulf Shores	TAXIWAY	03	P	163	50	14,853	1/1/2013	AC
TA	Taxiway A Gulf Shores	TAXIWAY	04	P	5,769	50	289,807	7/18/2004	AC
TA1	Taxiway A1 Gulf Shores	TAXIWAY	01	S	325	50	21,221	10/29/2004	AC
TA2	Taxiway A2 01 Gulf Shores	TAXIWAY	01	S	332	48	27,287	1/8/2004	AC
TA3	Taxiway A3 Gulf Shores	TAXIWAY	01	S	332	48	27,301	7/16/2003	AC
TA4	Taxiway A4 Gulf Shores	TAXIWAY	01	S	332	48	27,286	10/29/2004	AC
TA5	Taxiway A5 Gulf Shores	TAXIWAY	01	S	200	50	12,855	2/3/2003	AC
TC	Taxiway C Gulf Shores	TAXIWAY	01	P	955	30	28,905	3/6/2006	AC
TC	Taxiway C Gulf Shores	TAXIWAY	02	P	1,205	30	38,647	10/2/2010	AC
TC01	Taxiway Connector 01 Gulf Shores	TAXIWAY	01	S	183	35	8,460	10/2/2010	AC
TC02	Taxiway Connector 02 Gulf Shores	TAXIWAY	01	S	185	35	8,043	3/6/2006	AC
TC1	Taxiway C1 Gulf Shores	TAXIWAY	01	S	247	35	7,029	1/1/2013	AC

Appendix A
Pavement Inventory Report
Jack Edwards National Airport (JKA)

Branch ID	Name	Branch Use	Section ID	Rank[1]	Length (ft)	Width (ft)	Area (sf)	LCD[2]	Surface[3]
TC1	Taxiway C1 Gulf Shores	TAXIWAY	02	S	247	35	6,550	10/2/2010	AC
TC2	Taxiway C2 Gulf Shores	TAXIWAY	01	S	162	30	10,296	1/1/2013	AC
TE	Taxiway E Gulf Shores	TAXIWAY	01	P	2,112	35	75,147	4/27/2013	AC
TE1	Taxiway E1	TAXIWAY	01	S	161	35	8,867	1/1/2013	AC
TF	Taxiway F Gulf Shores	TAXIWAY	01	P	1,284	35	49,007	4/27/2013	AC
TF	Taxiway F Gulf Shores	TAXIWAY	02	P	210	35	12,064	1/1/2013	AC
THANG01	Taxiway Hangar 01 Gulf Shores	TAXIWAY	01	T	4,355	25	114,229	1/1/1978	AC
THANG02	Taxiway Hangar 02 Gulf Shores	TAXIWAY	01	T	3,500	50	160,823	1/2/2012	AC
THANG02	Taxiway Hangar 02 Gulf Shores	TAXIWAY	02	T	2,400	35	87,200	1/2/2012	AC

[1] P = Primary pavement, S = Secondary pavement, T = Tertiary pavement

[2] LCD = Last construction date. The date of the last major pavement rehabilitation (e.g. AC overlay)

[3] AC = Asphalt Cement Concrete, AAC = Aphalt Overlay AC, PCC = Portland cement Concrete, APC = Asphalt Overlay PCC

APPENDIX B

PMP Maps

B1: Inventory Maps
- B1A: Branch Identification
- B1B: Section Identification
- B1C: Sample Unit Layout
- B1D: Pavement Type
- B1E: Branch Use
- B1F: Pavement Age

B2: Surface Condition Maps
- B2A: 7-Color PCI
- B2B: 3-Color PCI
- B2C: FOD Rating
- B2D: Survey Photo Locations

B3: Pavement Capital Improvement Plan (PCIP) Maps
- B3A: 2027 Forecasted PCI without PCIP
- B3B: M&R Needs
- B3C: PCIP Recommendations

Legend

- Section Boundary
- PCC Aprons
- Shoulder or Other

Branch Identification

- Apron 01 Gulf Shores
- Apron 02 Gulf Shores
- Apron 03 Gulf Shores
- Apron 04 Gulf Shores
- Runway 09-27 Gulf Shores
- Runway 17-35 Gulf Shores
- Taxiway 01 Gulf Shores
- Taxiway A Gulf Shores
- Taxiway A1 Gulf Shores
- Taxiway A2 01 Gulf Shores
- Taxiway A3 Gulf Shores
- Taxiway A4 Gulf Shores
- Taxiway A5 Gulf Shores
- Taxiway C Gulf Shores
- Taxiway C1 Gulf Shores
- Taxiway C2 Gulf Shores
- Taxiway Connector 01 Gulf Shores
- Taxiway Connector 02 Gulf Shores
- Taxiway E Gulf Shores
- Taxiway E1
- Taxiway F Gulf Shores
- Taxiway Hangar 01 Gulf Shores
- Taxiway Hangar 02 Gulf Shores

TF-02
TF-01
Taxiway F
R1735-01
R1735-02
R0927-01
R0927-02
Runway 09-27
TWA1
TA1-01
TA-01
TA-02
R1735-03
TA-03
TWA2
TA2-01
TWA3
TA3-01
TA-04
TWA4
TA4-01
TA5-01
TWA5
T01-01
Taxiway A
THANG01-01
TW01
TC01-01
TC-02
Taxiway E
R1735-04
A01-01
TWC01
Taxiway C
TE-01
A01-02
Apron 01
T-Hangar 01
A01-03
TWC1
Runway 17-35
A04-01
Apron 04
A03-02
Apron 03
TC1-02
TC1-01
THANG02-02
TWC02
TC02-01
A03-01
A02-01
TWC2
TWE1
Apron 02
T-Hangar 02
THANG02-01
TC-01
TE1-01
TC2-01

Alabama Statewide
Pavement Management Program Update
Jack Edwards National (JKA) Airport
Gulf Shores, AL

Figure B1A

Branch Identification

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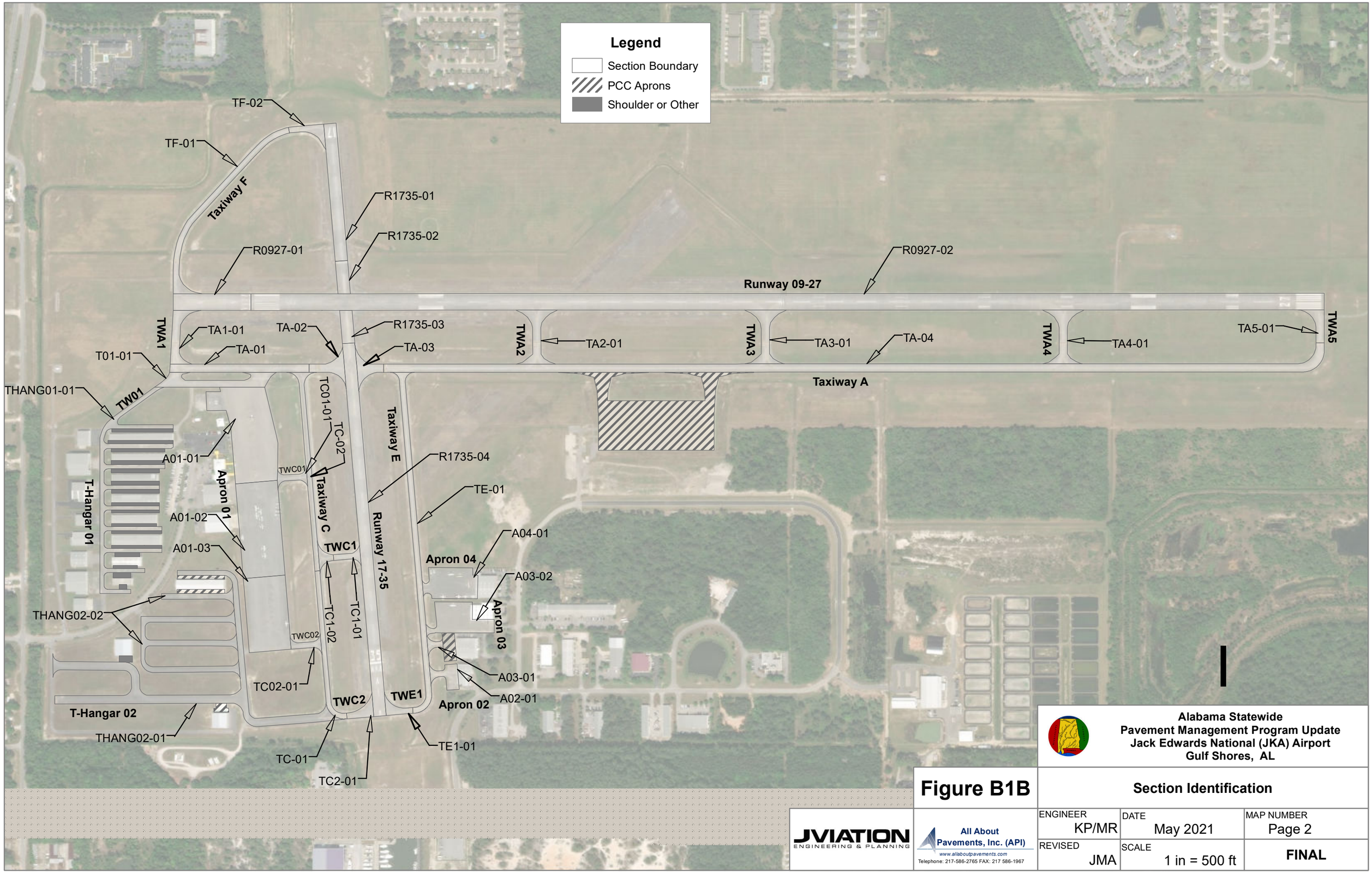
Telephone: 217-586-2765 FAX: 217 586-1967

ENGINEER	DATE	MAP NUMBER
KP/MR	May 2021	Page 1
REVISED	SCALE	
JMA	1 in = 500 ft	FINAL



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Jack Edwards National (JKA) Airport
Gulf Shores, AL

Figure B1B

Section Identification

JVIATION ENGINEERING & PLANNING

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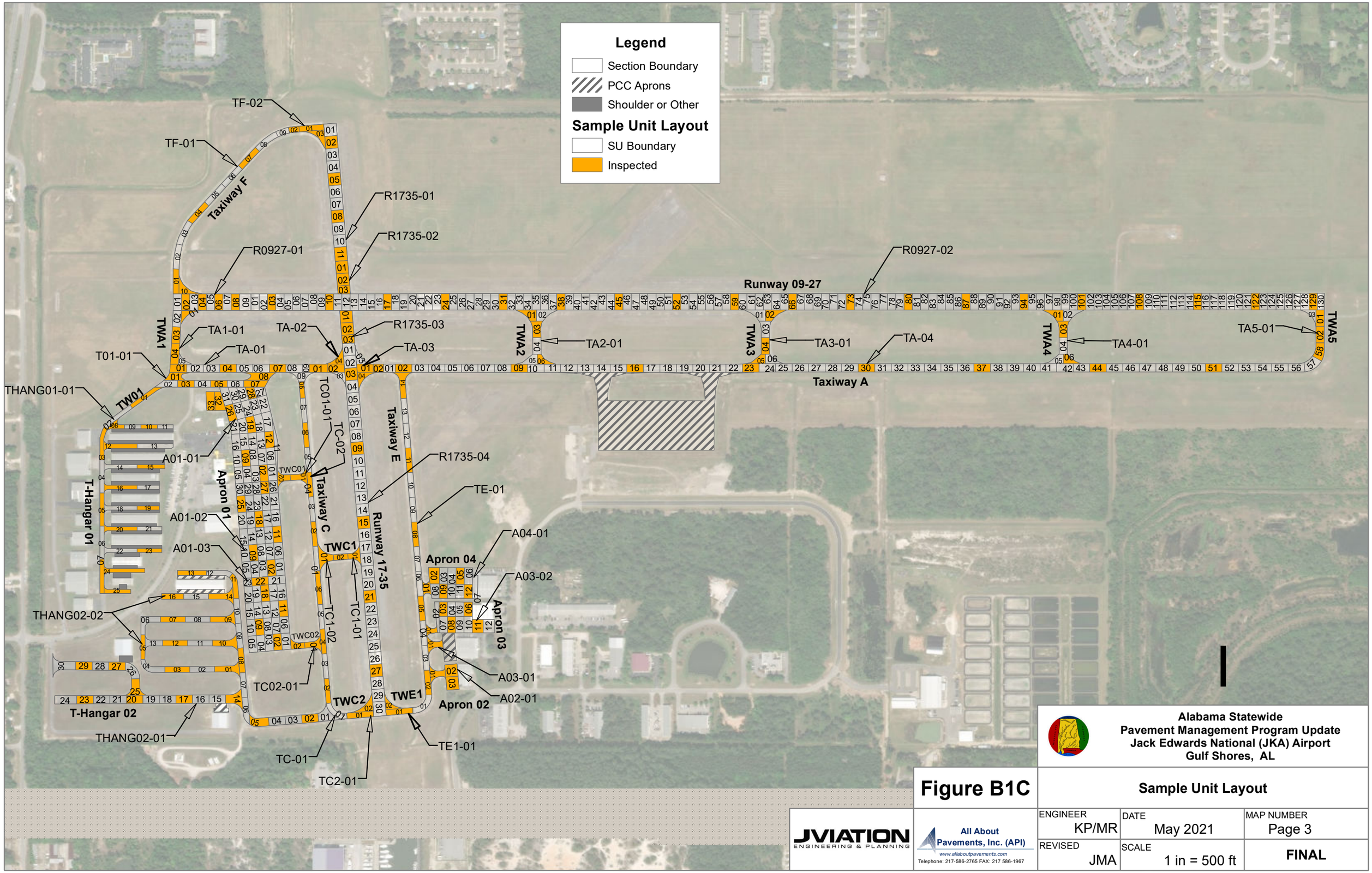
ENGINEER	DATE	MAP NUMBER
KP/MR	May 2021	Page 2
REVISED	SCALE	
JMA	1 in = 500 ft	FINAL



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Jack Edwards National (JKA) Airport
Gulf Shores, AL

Figure B1C

Sample Unit Layout

JVIATION ENGINEERING & PLANNING

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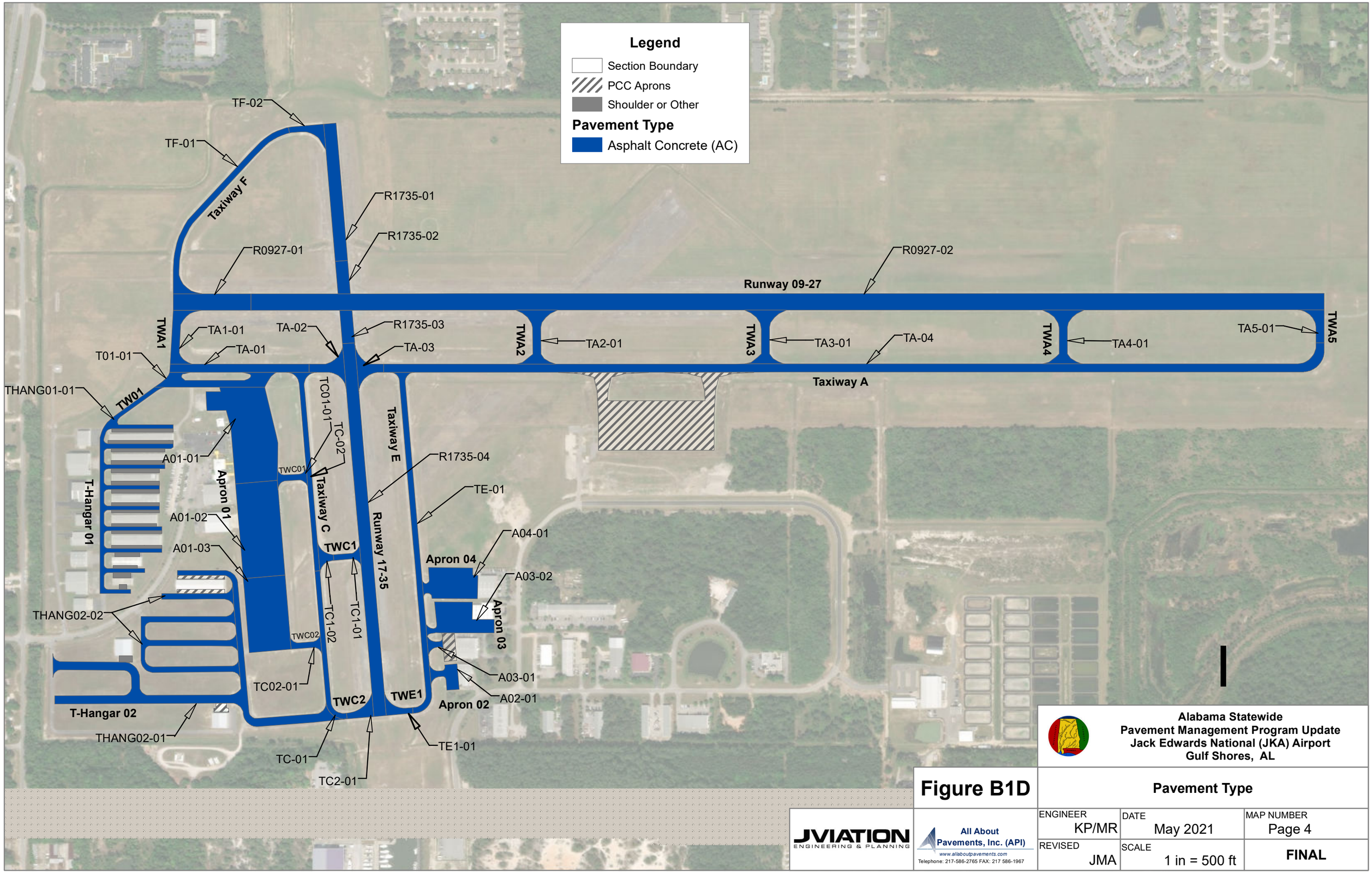
ENGINEER	DATE	MAP NUMBER
KP/MR	May 2021	Page 3
REVISED	SCALE	
JMA	1 in = 500 ft	FINAL



Alabama Statewide
Pavement Management Program Update
Jack Edwards National (JKA) Airport
Gulf Shores, AL

Figure B1D

Pavement Type

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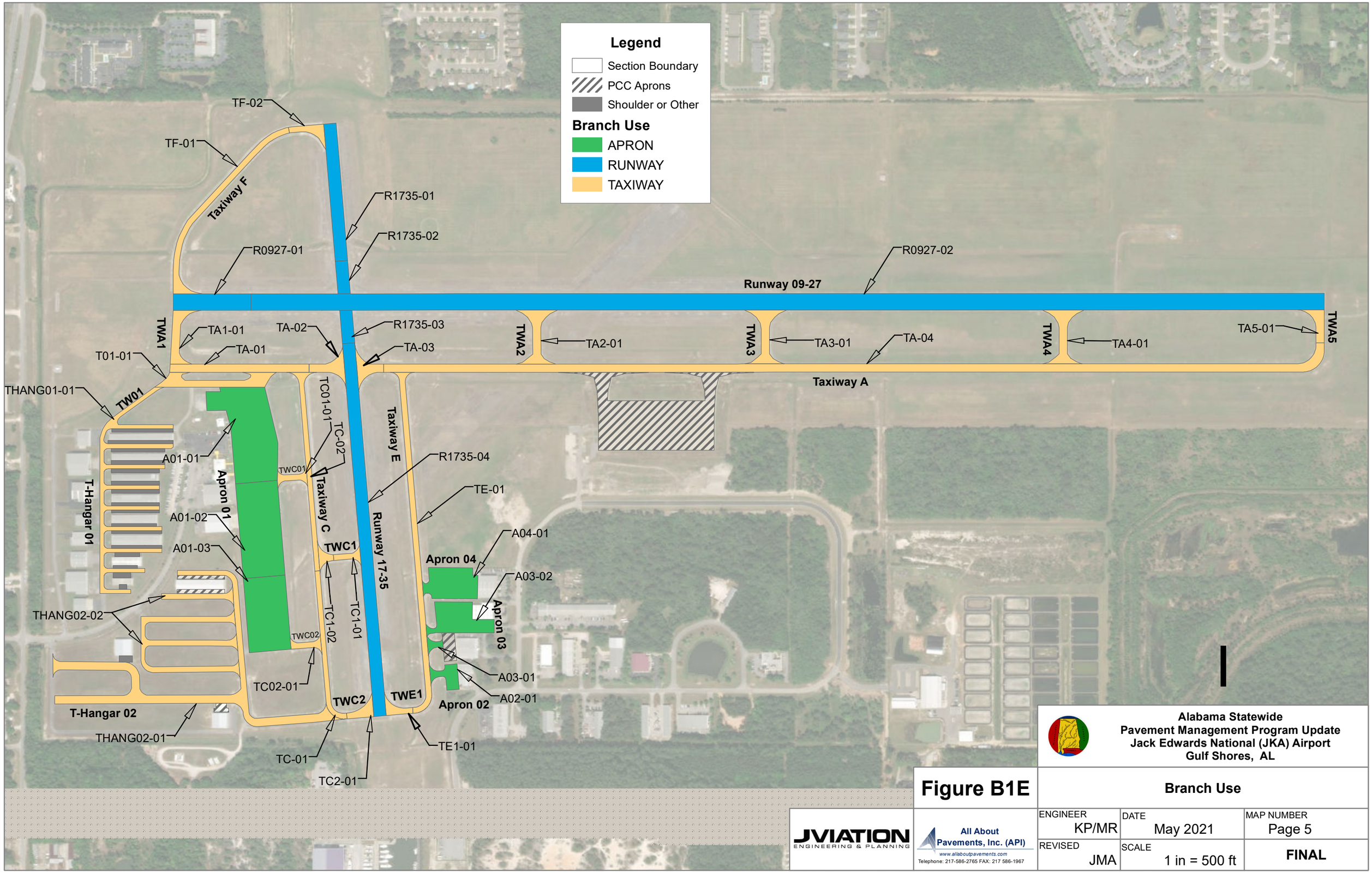
ENGINEER	DATE	MAP NUMBER
KP/MR	May 2021	Page 4
REVISED	SCALE	
JMA	1 in = 500 ft	FINAL



Alabama Statewide
Pavement Management Program Update
Jack Edwards National (JKA) Airport
Gulf Shores, AL

Figure B1E

Branch Use

JVIATION ENGINEERING & PLANNING

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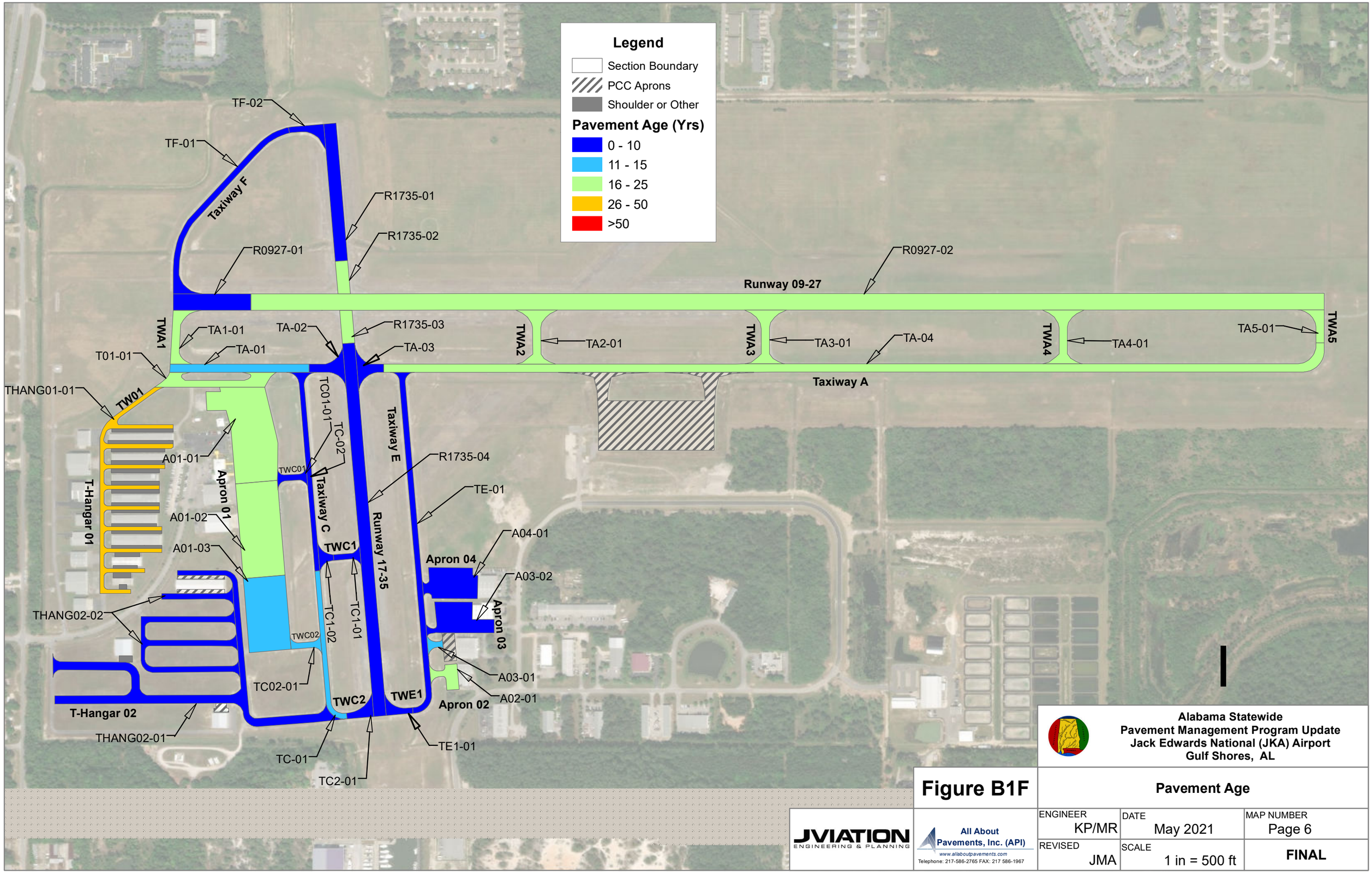
Telephone: 217-586-2765 FAX: 217 586-1967

ENGINEER	DATE	MAP NUMBER
KP/MR	May 2021	Page 5
REVISED	SCALE	
JMA	1 in = 500 ft	FINAL



Alabama Statewide
Pavement Management Program Update
Jack Edwards National (JKA) Airport
Gulf Shores, AL

Figure B1F

Pavement Age

JVIATION ENGINEERING & PLANNING

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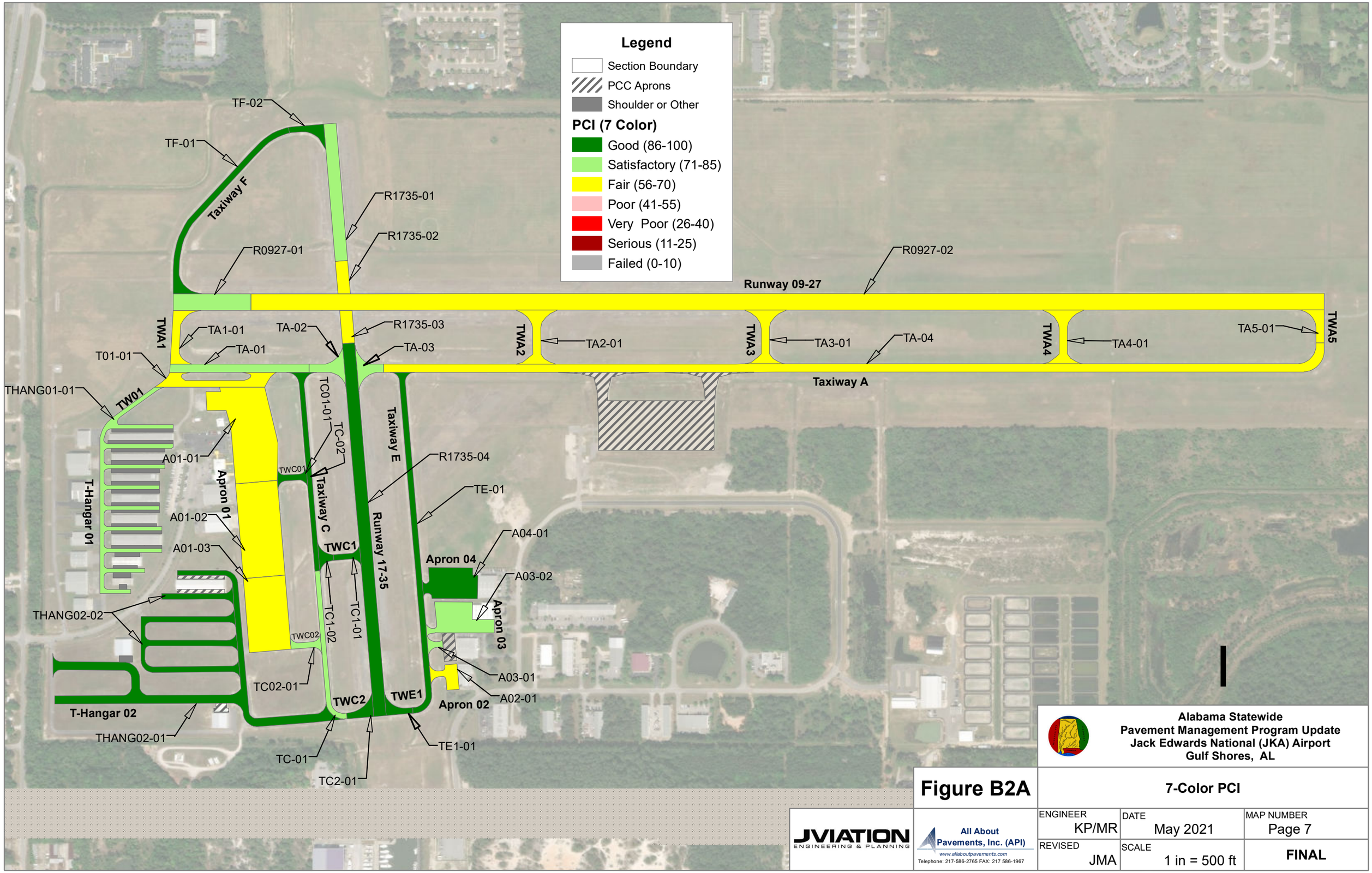
Telephone: 217-586-2765 FAX: 217 586-1967

ENGINEER	DATE	MAP NUMBER
KP/MR	May 2021	Page 6
REVISED	SCALE	
JMA	1 in = 500 ft	FINAL



Alabama Statewide
Pavement Management Program Update
Jack Edwards National (JKA) Airport
Gulf Shores, AL

Figure B2A

7-Color PCI

JVIATION ENGINEERING & PLANNING

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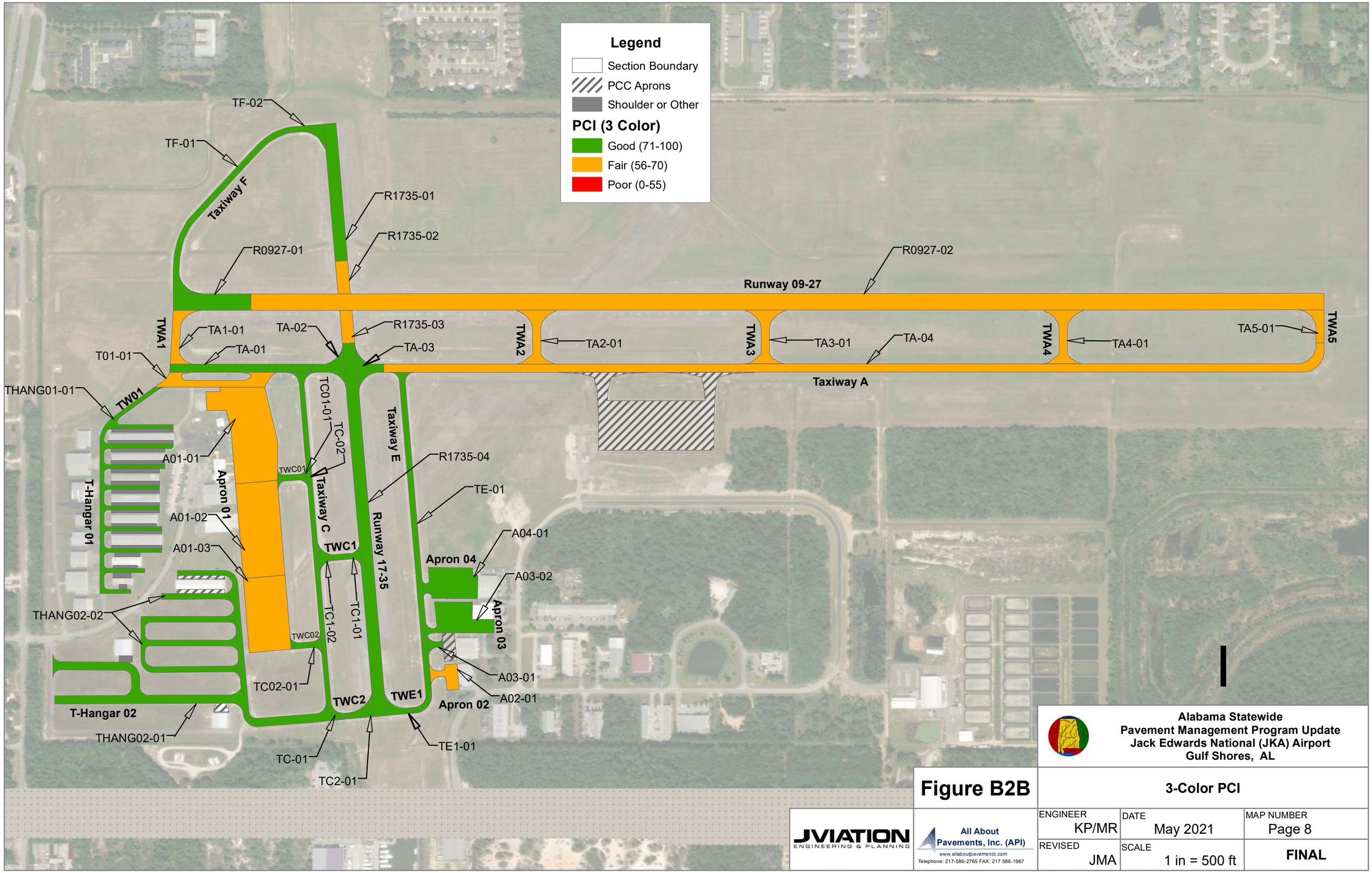
ENGINEER	DATE	MAP NUMBER
KP/MR	May 2021	Page 7
REVISED	SCALE	
JMA	1 in = 500 ft	**FINAL**



Alabama Statewide
Pavement Management Program Update
Jack Edwards National (JKA) Airport
Gulf Shores, AL

Figure B2B

3-Color PCI

JVIATION ENGINEERING & PLANNING

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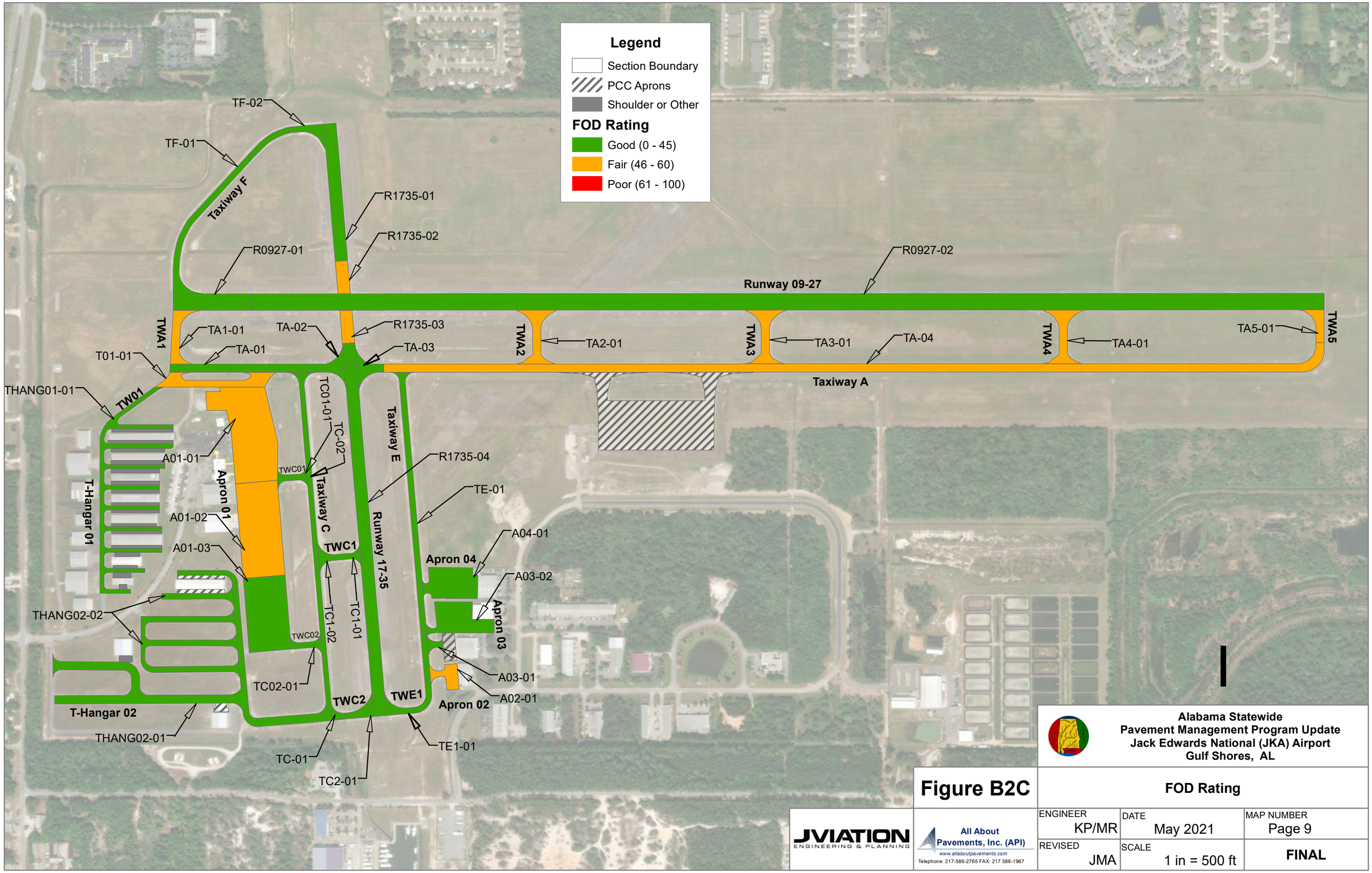
ENGINEER	DATE	MAP NUMBER
KP/MR	May 2021	Page 8
REVISED	SCALE	
JMA	1 in = 500 ft	**FINAL**



Alabama Statewide
Pavement Management Program Update
Jack Edwards National (JKA) Airport
Gulf Shores, AL

Figure B2C

FOD Rating

JVIATION ENGINEERING & PLANNING

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ENGINEER	DATE	MAP NUMBER
KP/MR	May 2021	Page 9
REVISED	SCALE	
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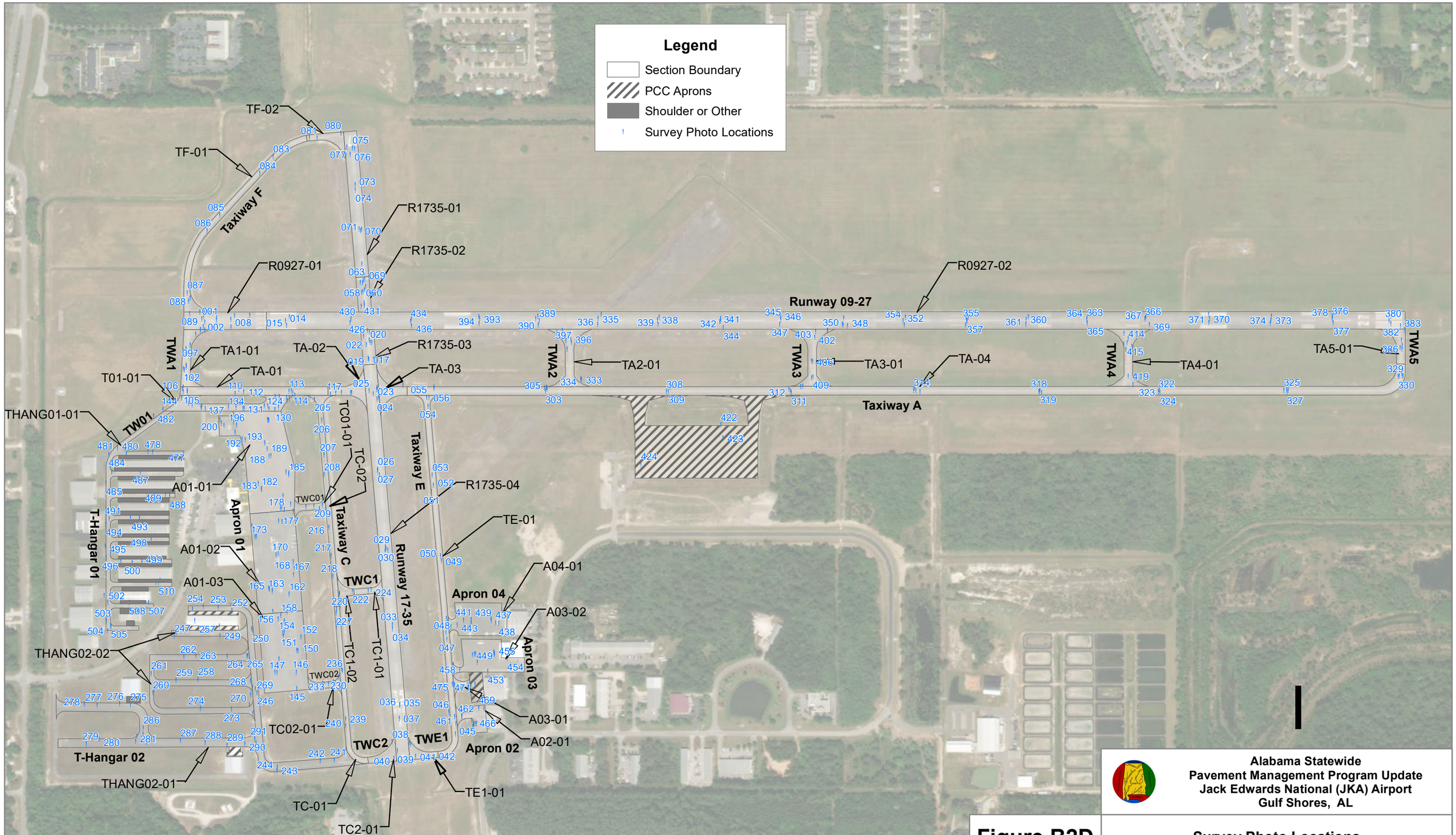

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Jack Edwards National (JKA) Airport
Gulf Shores, AL

Figure B2D

Survey Photo Locations

JVIATION ENGINEERING & PLANNING

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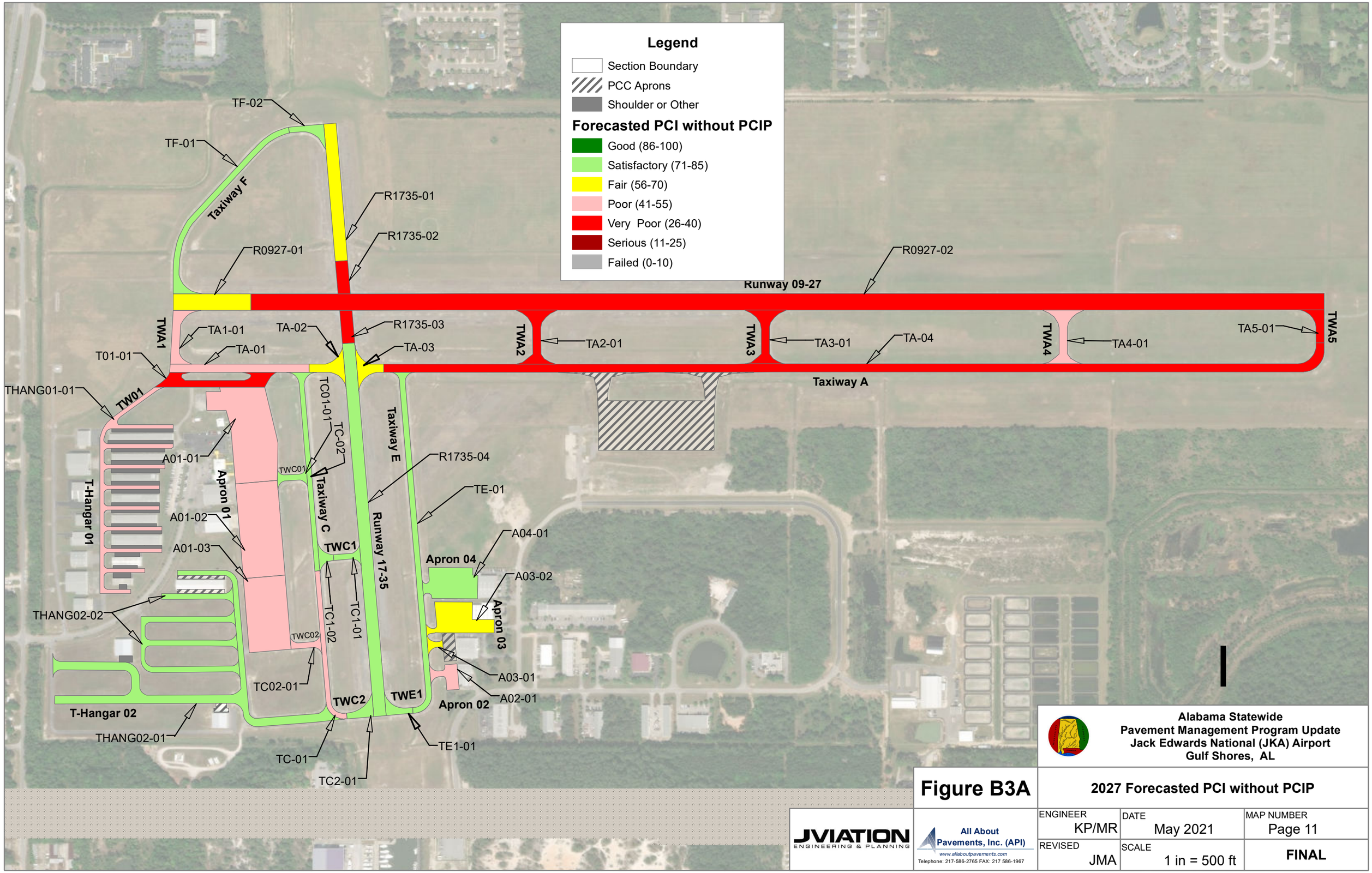
ENGINEER	DATE	MAP NUMBER
KP/MR	May 2021	Page 10
REVISED	SCALE	
JMA	1 in = 500 ft	FINAL



Alabama Statewide
Pavement Management Program Update
Jack Edwards National (JKA) Airport
Gulf Shores, AL

Figure B3A

2027 Forecasted PCI without PCIP

JVIATION ENGINEERING & PLANNING

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ENGINEER	DATE	MAP NUMBER
KP/MR	May 2021	Page 11
REVISED	SCALE	
JMA	1 in = 500 ft	FINAL

All sections recommended for Rehabilitation or Reconstruction between 2021 and 2024 also receive Surface Treatment in the 3rd year of paving.

Legend

Section Boundary
PCC Aprons
Shoulder or Other

Repair Type

Preservation
Rehabilitation

TF-02
TF-01
Taxiway F
R1735-01
R1735-02
R0927-01
R0927-02
Runway 09-27
TWA1
TA1-01
TA-01
TA-02
R1735-03
TA-03
TWA2
TA2-01
TWA3
TA3-01
TA-04
TWA4
TA4-01
TA5-01
TWA5
T01-01
THANG01-01
TW01
Taxiway A
TC01-01
TC-02
Taxiway E
A01-01
TWC01
Apron 01
T-Hangar 01
Taxiway C
R1735-04
TE-01
A01-02
A01-03
TWC1
Runway 17-35
Apron 04
A04-01
A03-02
THANG02-02
TC1-02
TC1-01
Apron 03
TWC02
A03-01
TC02-01
TWC2
TWE1
Apron 02
A02-01
T-Hangar 02
THANG02-01
TC-01
TE1-01
TC2-01

Alabama Statewide
Pavement Management Program Update
Jack Edwards National (JKA) Airport
Gulf Shores, AL

Figure B3B

Repair Type

JVIATION ENGINEERING & PLANNING

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Telephone: 217-586-2765 FAX: 217 586-1967

ENGINEER	DATE	MAP NUMBER
KP/MR	May 2021	Page 12
REVISED	SCALE	
JMA	1 in = 500 ft	FINAL

All sections recommended for Mill & AC Overlay or AC Reconstruction between 2021 and 2024 also receive Surface Treatment in the 3rd year of paving

Legend

Project Name

- JKA_21-01_Runway 17-35 Preservation
- JKA_21-02_Taxiway E Preservation
- JKA_21-03_Taxiway F Preservation
- JKA_21-04_Taxiway C Preservation
- JKA_22-01_Taxiway A Rehabilitation
- JKA_21-05_Aprons 03 & 04 Preservation
- JKA_21-06_Taxiway Hangar 02 Preservation
- JKA_21-07_Runway 09-27 Rehabilitation
- JKA_23-01_Apron 01 Rehabilitation
- JKA_23-02_Aprons 02 & 03 Rehabilitation
- JKA_24-01_Taxiway Hangar 01 Rehabilitation

M&R Activity

- Mill 2" & 2" AC OL
- Mill 2" & 2" AC OLP
- Runway Surface Treatment
- Taxiway & Apron Surface Treatment

TF-02
TF-01
Taxiway F
R1735-01
R1735-02
R0927-01
R0927-02
Runway 09-27
TWA1
TA1-01
TA-01
TA-02
R1735-03
TA-03
TWA2
TA2-01
TWA3
TA3-01
TA-04
TWA4
TA4-01
TA5-01
TWA5
T01-01
THANG01-01
TW01
Taxiway A
TC01-01
TC-02
Taxiway E
A01-01
TWC01
Taxiway C
R1735-04
TE-01
A01-02
A01-03
T-Hangar 01
Apron 01
TWC1
Runway 17-35
Apron 04
A04-01
A03-02
Apron 03
TC1-01
TC1-02
THANG02-02
TWC02
TC02-01
A03-01
A02-01
TWC2
TWE1
Apron 02
T-Hangar 02
THANG02-01
TC-01
TC2-01
TE1-01

Alabama Statewide
Pavement Management Program Update
Jack Edwards National (JKA) Airport
Gulf Shores, AL

Figure B3C

PCIP Recommendations

JVIATION ENGINEERING & PLANNING

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Telephone: 217-586-2765 FAX: 217 586-1967

ENGINEER	DATE	MAP NUMBER
KP/MR	May 2021	Page 13
REVISED	SCALE	
JMA	1 in = 500 ft	FINAL

APPENDIX C

OVERVIEW OF PAVEMENT DISTRESSES

1. Alligator Cracking (AC)

2. Bleeding (AC)

3. Block Cracking (AC)

-
-
-

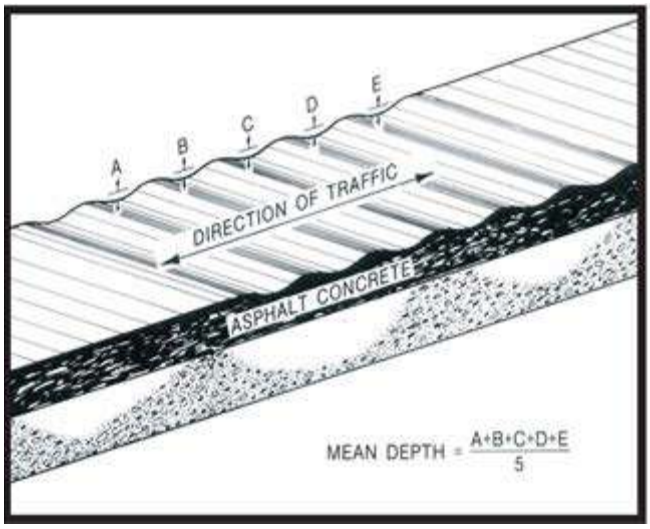
-
-
-

4. Corrugation (AC)

Description

Corrugation is a series of closely spaced ridges and valleys (ripples) occurring at fairly regular intervals, usually less than 5 feet (1.5 meters) along the pavement. The ridges are perpendicular to the traffic direction. Traffic action combined with an unstable pavement surface or base usually causes this type of distress.

Severity Levels



_____

-
-
-

_____

-
-
-


CAP

7. Joint Reflection Cracking (AC)

_____

-
-

-

_____

-
-
-


48 M

9. Oil Spillage (AC)

_____

_____

-
-

10. Patching

_____

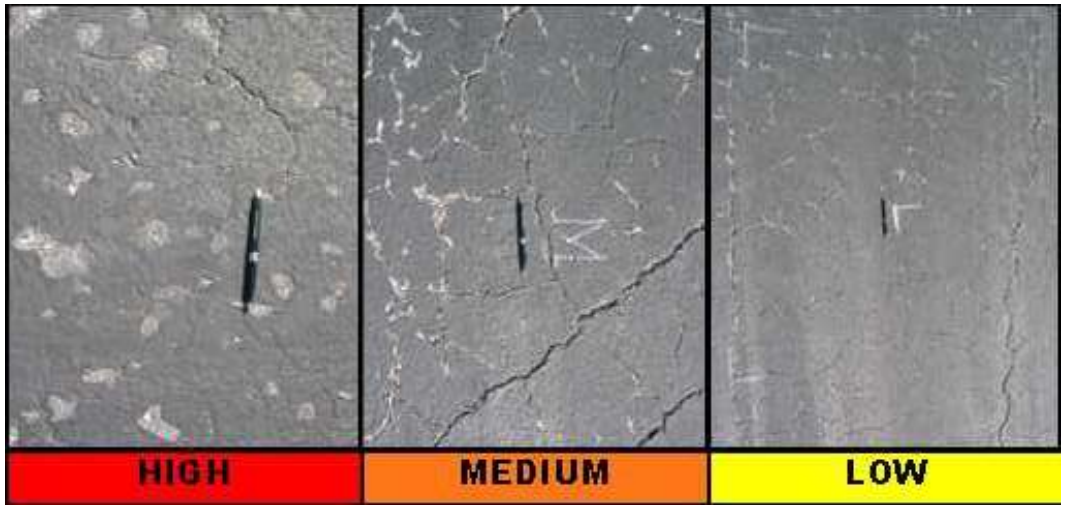
-
-
-

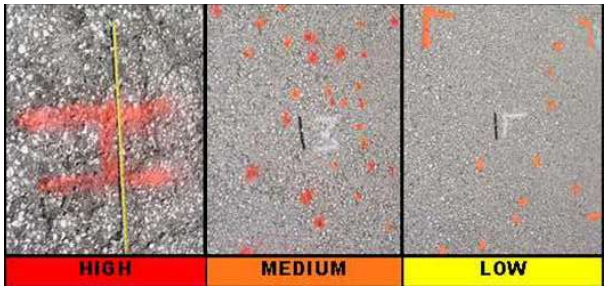
_____

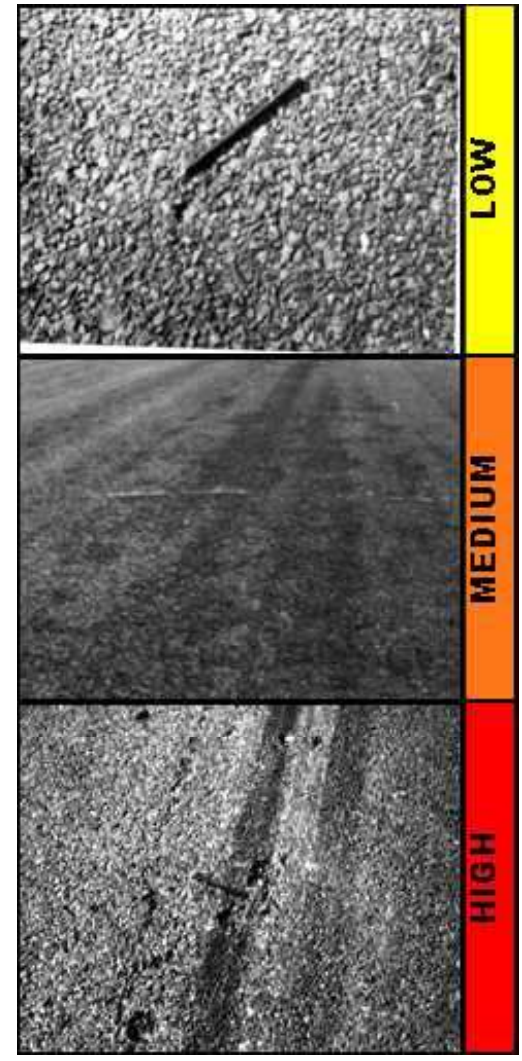
-
-
-

11. Polished Aggregate (AC)

12. Raveling (AC)


HIGH
MEDIUM
LOW


HIGH
MEDIUM
LOW


LOW
MEDIUM
HIGH

13. Rutting (AC)

from the direction of traffic. They are produced when braking or turning wheels cause the

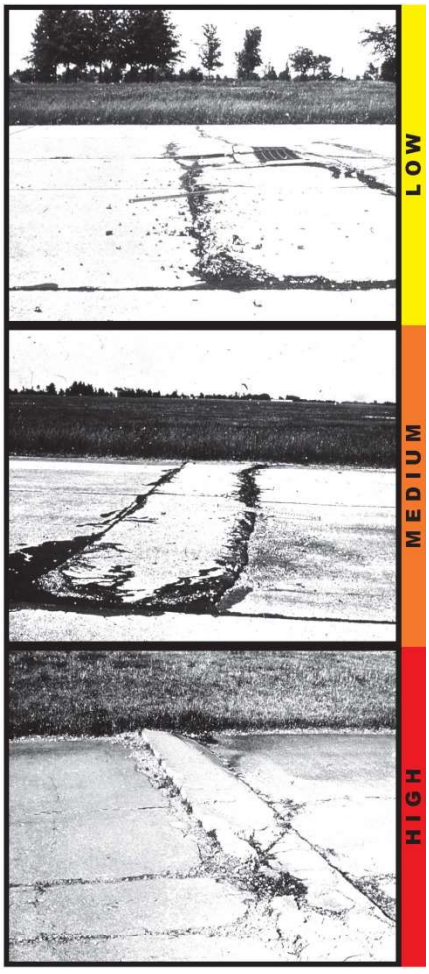
_____ No degrees of severity are defined. It is sufficient to indicate that a slippage

_____

- ♦
- ♦

15. Swelling (AC)

16. Weathering (AC)

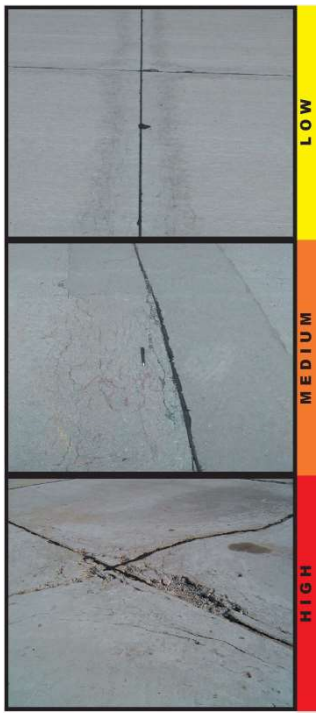

LOW
MEDIUM
HIGH

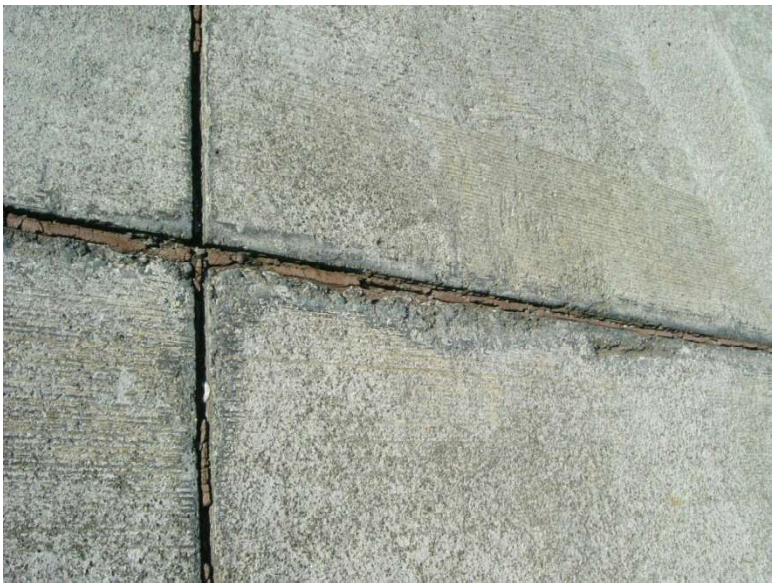
- filled, it has a mean width less than approximately 1 inch (3 millimeters); a filled crack can be of any width, but the filler material

- One of the following conditions exists: (1) filled or non filled c filled crack has a mean width between 1/8 inch (3 millimeters) and 1 inch (25 millimeters); (3) a filled crack is not spalled or only lightly spalled, but the filler is in unsatisfactory

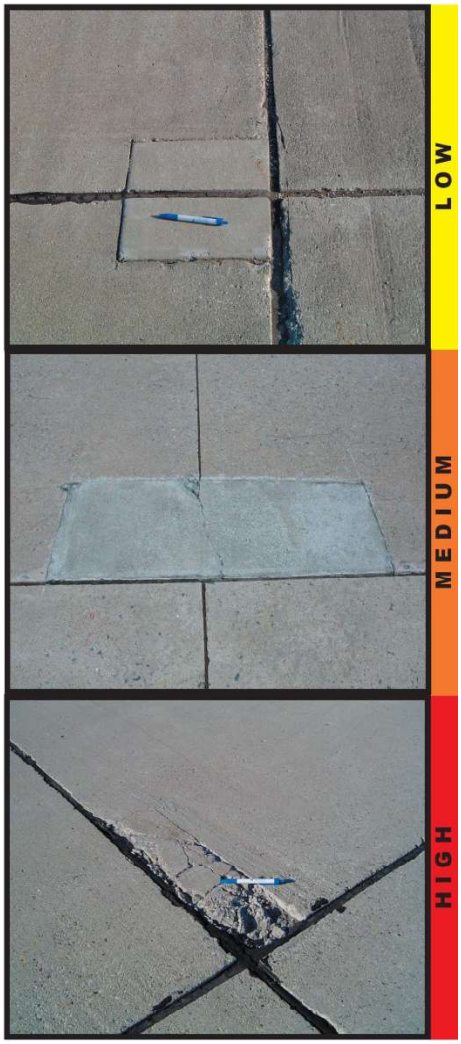
- One of the following conditions exists: (1) filled or non filled crack is severely spalled, causing definite FOD potential; (2) a non filled crack ha

parallel to a joint or linear crack. A dark coloring can usually be seen around the fine





has been removed and replaced by a filler



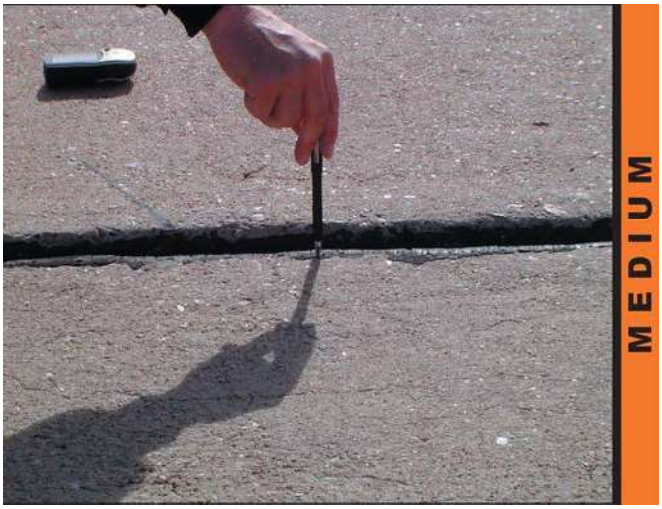
Patching is the same as defined

No degrees of severity are defined for popouts.

of approximately 1⁄4 to 1⁄2 in

Severity levels are defined by the difference in elevation across the fault and the

-
-
-



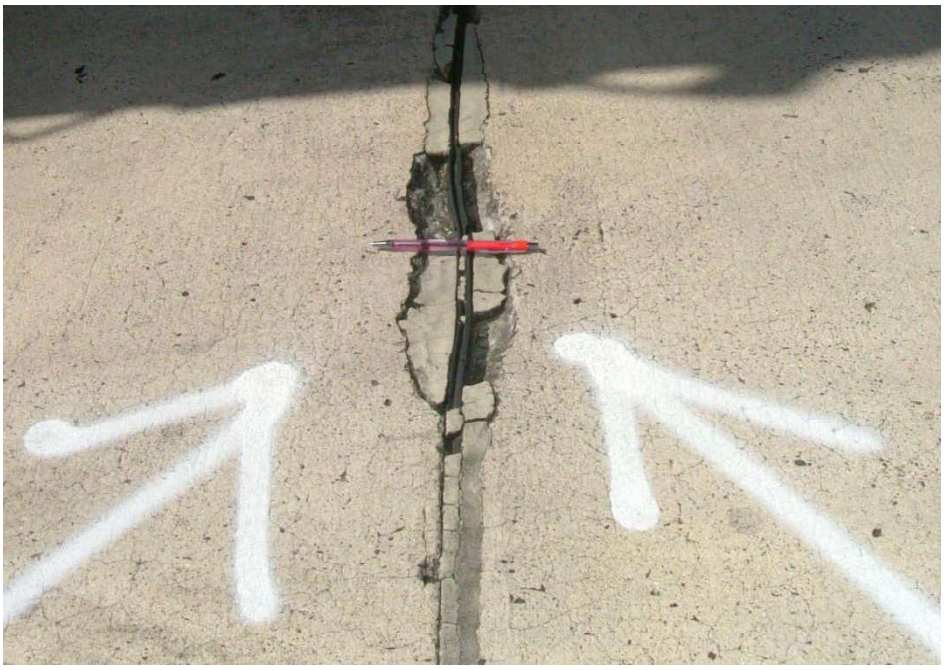
severity level of this distress type, as defined below,

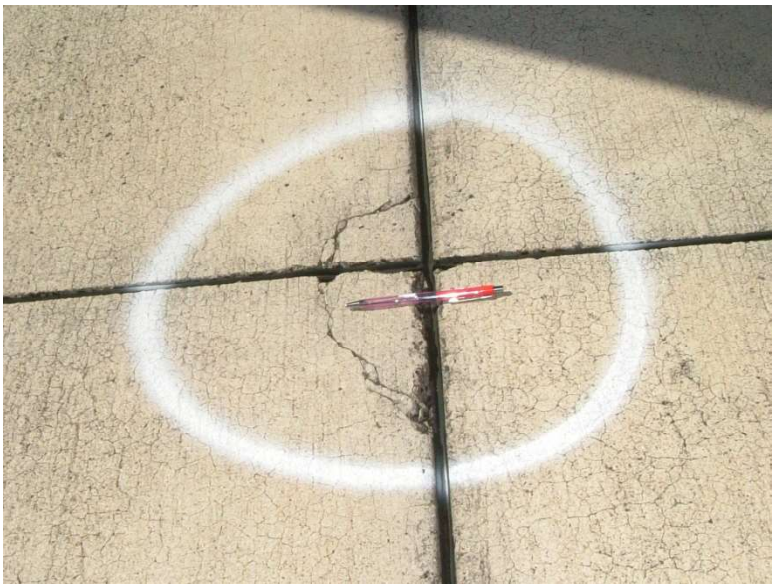
- Slab is broken into four or five pieces with the vast majority of the cracks
- (1) Slab is broken into four or five pieces with over 15 percent of the
- four or five pieces with some or all of the cracks of high severity; (2) slab is

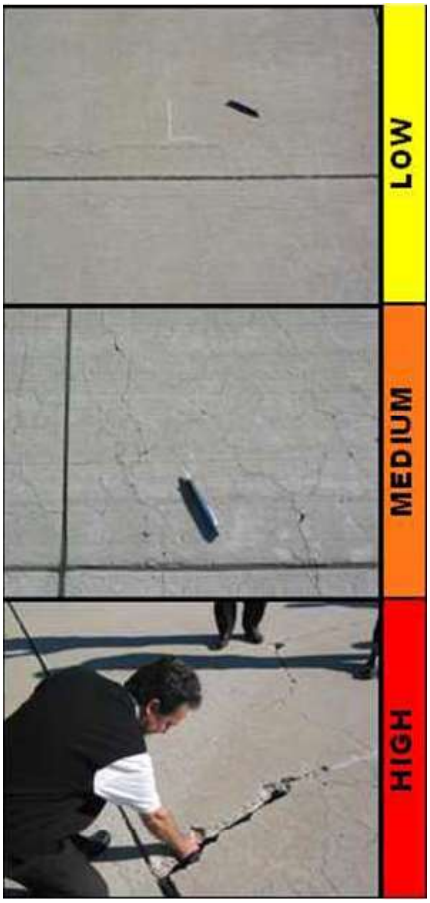
---

-
-
-

No degrees of severity are defined. It is sufficient to indicate that shrinkage cracks exist.






LOW
MEDIUM
HIGH

APPENDIX D

DETAILED PAVEMENT CONDITION DATA

APPENDIX E

DISTRESS SUMMARY REPORT

Appendix E

Distress Summary Report

Jack Edwards National Airport (JKA)

Branch ID	Section ID	Surface[1]	Area (sf)	Distress Number	Description	Distress Mechanism	Severity	Quantity	Quantity Units	Distress Density
A01	01	AC	163,970	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	3,874	Ft	2.4%
A01	01	AC	163,970	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	7,272	Ft	4.4%
A01	01	AC	163,970	52	RAVELING	Climate/Durability	Low	3,205	SqFt	2.0%
A01	01	AC	163,970	57	WEATHERING	Climate/Durability	Low	88,942	SqFt	54.2%
A01	01	AC	163,970	57	WEATHERING	Climate/Durability	Medium	21,635	SqFt	13.2%
A01	02	AC	146,625	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	2,983	Ft	2.0%
A01	02	AC	146,625	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	6,316	Ft	4.3%
A01	02	AC	146,625	57	WEATHERING	Climate/Durability	Low	85,719	SqFt	58.5%
A01	02	AC	146,625	57	WEATHERING	Climate/Durability	Medium	5,013	SqFt	3.4%
A01	03	AC	114,750	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	2,614	Ft	2.3%
A01	03	AC	114,750	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	3,375	Ft	2.9%
A01	03	AC	114,750	57	WEATHERING	Climate/Durability	Low	57,600	SqFt	50.2%
A01	03	AC	114,750	57	WEATHERING	Climate/Durability	Medium	4,950	SqFt	4.3%
A02	01	AC	16,338	43	BLOCK CRACKING	Climate/Durability	Low	2,800	SqFt	17.1%
A02	01	AC	16,338	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	180	Ft	1.1%
A02	01	AC	16,338	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	27	Ft	0.2%
A02	01	AC	16,338	50	PATCHING	Climate/Durability	Medium	200	SqFt	1.2%
A02	01	AC	16,338	52	RAVELING	Climate/Durability	High	300	SqFt	1.8%
A02	01	AC	16,338	52	RAVELING	Climate/Durability	Low	2,000	SqFt	12.2%
A02	01	AC	16,338	57	WEATHERING	Climate/Durability	Low	3,500	SqFt	21.4%
A02	01	AC	16,338	57	WEATHERING	Climate/Durability	Medium	4,150	SqFt	25.4%
A03	01	AC	4,696	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	46	Ft	1.0%

Appendix E

Distress Summary Report

Jack Edwards National Airport (JKA)

Branch ID	Section ID	Surface[1]	Area (sf)	Distress Number	Description	Distress Mechanism	Severity	Quantity	Quantity Units	Distress Density
A03	01	AC	4,696	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	88	Ft	1.9%
A03	01	AC	4,696	57	WEATHERING	Climate/Durability	Low	2,000	SqFt	42.6%
A03	01	AC	4,696	57	WEATHERING	Climate/Durability	Medium	400	SqFt	8.5%
A03	02	AC	54,298	45	DEPRESSION	Other	Low	101	SqFt	0.2%
A03	02	AC	54,298	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	743	Ft	1.4%
A03	02	AC	54,298	52	RAVELING	Climate/Durability	Medium	25	SqFt	0.0%
A03	02	AC	54,298	57	WEATHERING	Climate/Durability	Low	18,134	SqFt	33.4%
A03	02	AC	54,298	57	WEATHERING	Climate/Durability	Medium	4,785	SqFt	8.8%
A04	01	AC	55,884	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	High	24	Ft	0.0%
A04	01	AC	55,884	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	547	Ft	1.0%
A04	01	AC	55,884	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	144	Ft	0.3%
A04	01	AC	55,884	57	WEATHERING	Climate/Durability	Low	4,802	SqFt	8.6%
A04	01	AC	55,884	57	WEATHERING	Climate/Durability	Medium	2,401	SqFt	4.3%
R0927	01	AC	46,900	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	3,201	Ft	6.8%
R0927	01	AC	46,900	57	WEATHERING	Climate/Durability	Low	4,690	SqFt	10.0%
R0927	01	AC	46,900	57	WEATHERING	Climate/Durability	Medium	235	SqFt	0.5%
R0927	02	AC	649,300	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	49,791	Ft	7.7%
R0927	02	AC	649,300	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	3,950	Ft	0.6%
R0927	02	AC	649,300	52	RAVELING	Climate/Durability	Low	547	SqFt	0.1%
R0927	02	AC	649,300	57	WEATHERING	Climate/Durability	Low	375,972	SqFt	57.9%
R0927	02	AC	649,300	57	WEATHERING	Climate/Durability	Medium	41,350	SqFt	6.4%
R1735	01	AC	62,550	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	603	Ft	1.0%

Appendix E

Distress Summary Report

Jack Edwards National Airport (JKA)

Branch ID	Section ID	Surface[1]	Area (sf)	Distress Number	Description	Distress Mechanism	Severity	Quantity	Quantity Units	Distress Density
R1735	01	AC	62,550	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	292	Ft	0.5%
R1735	01	AC	62,550	57	WEATHERING	Climate/Durability	Low	22,518	SqFt	36.0%
R1735	01	AC	62,550	57	WEATHERING	Climate/Durability	Medium	278	SqFt	0.4%
R1735	02	AC	15,000	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	516	Ft	3.4%
R1735	02	AC	15,000	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	558	Ft	3.7%
R1735	02	AC	15,000	52	RAVELING	Climate/Durability	Low	201	SqFt	1.3%
R1735	02	AC	15,000	57	WEATHERING	Climate/Durability	Low	7,032	SqFt	46.9%
R1735	02	AC	15,000	57	WEATHERING	Climate/Durability	Medium	603	SqFt	4.0%
R1735	03	AC	15,039	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	310	Ft	2.1%
R1735	03	AC	15,039	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	520	Ft	3.5%
R1735	03	AC	15,039	57	WEATHERING	Climate/Durability	Low	4,700	SqFt	31.3%
R1735	03	AC	15,039	57	WEATHERING	Climate/Durability	Medium	1,400	SqFt	9.3%
R1735	04	AC	169,650	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	1,592	Ft	0.9%
R1735	04	AC	169,650	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	60	Ft	0.0%
R1735	04	AC	169,650	57	WEATHERING	Climate/Durability	Low	21,112	SqFt	12.4%
T01	01	AC	38,560	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	555	Ft	1.4%
T01	01	AC	38,560	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	2,481	Ft	6.4%
T01	01	AC	38,560	57	WEATHERING	Climate/Durability	Low	17,634	SqFt	45.7%
T01	01	AC	38,560	57	WEATHERING	Climate/Durability	Medium	6,670	SqFt	17.3%
TA	01	AC	42,086	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	1,097	Ft	2.6%
TA	01	AC	42,086	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	744	Ft	1.8%

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Distress Summary Report

Jack Edwards National Airport (JKA)

Branch ID	Section ID	Surface[1]	Area (sf)	Distress Number	Description	Distress Mechanism	Severity	Quantity	Quantity Units	Distress Density
TA	01	AC	42,086	57	WEATHERING	Climate/Durability	Low	19,640	SqFt	46.7%
TA	01	AC	42,086	57	WEATHERING	Climate/Durability	Medium	5,611	SqFt	13.3%
TA	02	AC	16,651	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	12	Ft	0.1%
TA	02	AC	16,651	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	105	Ft	0.6%
TA	02	AC	16,651	52	RAVELING	Climate/Durability	Low	127	SqFt	0.8%
TA	02	AC	16,651	57	WEATHERING	Climate/Durability	Low	9,804	SqFt	58.9%
TA	02	AC	16,651	57	WEATHERING	Climate/Durability	Medium	1,396	SqFt	8.4%
TA	03	AC	14,853	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	56	Ft	0.4%
TA	03	AC	14,853	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	99	Ft	0.7%
TA	03	AC	14,853	57	WEATHERING	Climate/Durability	Low	12,032	SqFt	81.0%
TA	03	AC	14,853	57	WEATHERING	Climate/Durability	Medium	493	SqFt	3.3%
TA	04	AC	289,807	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	4,341	Ft	1.5%
TA	04	AC	289,807	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	12,848	Ft	4.4%
TA	04	AC	289,807	56	SWELLING	Other	Low	837	SqFt	0.3%
TA	04	AC	289,807	57	WEATHERING	Climate/Durability	Low	171,952	SqFt	59.3%
TA1	01	AC	21,221	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	550	Ft	2.6%
TA1	01	AC	21,221	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	468	Ft	2.2%
TA1	01	AC	21,221	52	RAVELING	Climate/Durability	Low	74	SqFt	0.4%
TA1	01	AC	21,221	57	WEATHERING	Climate/Durability	Low	10,107	SqFt	47.6%
TA1	01	AC	21,221	57	WEATHERING	Climate/Durability	Medium	2,601	SqFt	12.3%
TA2	01	AC	27,287	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	941	Ft	3.4%
TA2	01	AC	27,287	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	777	Ft	2.8%

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Distress Summary Report

Jack Edwards National Airport (JKA)

Branch ID	Section ID	Surface[1]	Area (sf)	Distress Number	Description	Distress Mechanism	Severity	Quantity	Quantity Units	Distress Density
TA2	01	AC	27,287	52	RAVELING	Climate/Durability	Low	811	SqFt	3.0%
TA2	01	AC	27,287	57	WEATHERING	Climate/Durability	Low	20,282	SqFt	74.3%
TA2	01	AC	27,287	57	WEATHERING	Climate/Durability	Medium	2,073	SqFt	7.6%
TA3	01	AC	27,301	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	429	Ft	1.6%
TA3	01	AC	27,301	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	1,062	Ft	3.9%
TA3	01	AC	27,301	52	RAVELING	Climate/Durability	Low	601	SqFt	2.2%
TA3	01	AC	27,301	57	WEATHERING	Climate/Durability	Low	19,038	SqFt	69.7%
TA3	01	AC	27,301	57	WEATHERING	Climate/Durability	Medium	3,515	SqFt	12.9%
TA4	01	AC	27,286	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	92	Ft	0.3%
TA4	01	AC	27,286	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	1,083	Ft	4.0%
TA4	01	AC	27,286	57	WEATHERING	Climate/Durability	Low	14,992	SqFt	54.9%
TA4	01	AC	27,286	57	WEATHERING	Climate/Durability	Medium	2,998	SqFt	11.0%
TA5	01	AC	12,855	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	334	Ft	2.6%
TA5	01	AC	12,855	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	643	Ft	5.0%
TA5	01	AC	12,855	57	WEATHERING	Climate/Durability	Low	7,713	SqFt	60.0%
TA5	01	AC	12,855	57	WEATHERING	Climate/Durability	Medium	771	SqFt	6.0%
TC	01	AC	28,905	45	DEPRESSION	Other	Low	77	SqFt	0.3%
TC	01	AC	28,905	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	900	Ft	3.1%
TC	01	AC	28,905	52	RAVELING	Climate/Durability	Low	7,164	SqFt	24.8%
TC	01	AC	28,905	57	WEATHERING	Climate/Durability	Low	7,662	SqFt	26.5%
TC	01	AC	28,905	57	WEATHERING	Climate/Durability	Medium	5,076	SqFt	17.6%
TC	02	AC	38,647	52	RAVELING	Climate/Durability	Low	12	SqFt	0.0%
TC	02	AC	38,647	57	WEATHERING	Climate/Durability	Medium	82	SqFt	0.2%
TC01	01	AC	8,460	57	WEATHERING	Climate/Durability	Medium	1,350	SqFt	16.0%

Appendix E

Distress Summary Report

Jack Edwards National Airport (JKA)

Branch ID	Section ID	Surface[1]	Area (sf)	Distress Number	Description	Distress Mechanism	Severity	Quantity	Quantity Units	Distress Density
TC02	01	AC	8,043	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	121	Ft	1.5%
TC02	01	AC	8,043	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	115	Ft	1.4%
TC02	01	AC	8,043	57	WEATHERING	Climate/Durability	Low	4,000	SqFt	49.7%
TC02	01	AC	8,043	57	WEATHERING	Climate/Durability	Medium	1,100	SqFt	13.7%
TC1	01	AC	7,029	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	30	Ft	0.4%
TC1	01	AC	7,029	57	WEATHERING	Climate/Durability	Low	2,700	SqFt	38.4%
TC1	01	AC	7,029	57	WEATHERING	Climate/Durability	Medium	800	SqFt	11.4%
TC1	02	AC	6,550	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	30	Ft	0.5%
TC1	02	AC	6,550	57	WEATHERING	Climate/Durability	Medium	750	SqFt	11.5%
TC2	01	AC	10,296	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	44	Ft	0.4%
TC2	01	AC	10,296	57	WEATHERING	Climate/Durability	Low	5,000	SqFt	48.6%
TC2	01	AC	10,296	57	WEATHERING	Climate/Durability	Medium	700	SqFt	6.8%
TE	01	AC	75,147	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	1,590	Ft	2.1%
TE	01	AC	75,147	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	186	Ft	0.2%
TE	01	AC	75,147	57	WEATHERING	Climate/Durability	Low	10,238	SqFt	13.6%
TE	01	AC	75,147	57	WEATHERING	Climate/Durability	Medium	808	SqFt	1.1%
TE1	01	AC	8,867	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	30	Ft	0.3%
TE1	01	AC	8,867	57	WEATHERING	Climate/Durability	Low	4,500	SqFt	50.7%
TE1	01	AC	8,867	57	WEATHERING	Climate/Durability	Medium	300	SqFt	3.4%
TF	01	AC	49,007	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	553	Ft	1.1%
TF	01	AC	49,007	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	82	Ft	0.2%
TF	01	AC	49,007	57	WEATHERING	Climate/Durability	Low	17,503	SqFt	35.7%

Appendix E

Distress Summary Report

Jack Edwards National Airport (JKA)

Branch ID	Section ID	Surface[1]	Area (sf)	Distress Number	Description	Distress Mechanism	Severity	Quantity	Quantity Units	Distress Density
TF	01	AC	49,007	57	WEATHERING	Climate/Durability	Medium	2,100	SqFt	4.3%
TF	02	AC	12,064	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	30	Ft	0.2%
TF	02	AC	12,064	57	WEATHERING	Climate/Durability	Low	6,100	SqFt	50.6%
TF	02	AC	12,064	57	WEATHERING	Climate/Durability	Medium	800	SqFt	6.6%
THANG01	01	AC	114,229	41	ALLIGATOR CRACKING	Load	Low	98	SqFt	0.1%
THANG01	01	AC	114,229	45	DEPRESSION	Other	Low	827	SqFt	0.7%
THANG01	01	AC	114,229	45	DEPRESSION	Other	Medium	98	SqFt	0.1%
THANG01	01	AC	114,229	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	1,368	Ft	1.2%
THANG01	01	AC	114,229	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	180	Ft	0.2%
THANG01	01	AC	114,229	52	RAVELING	Climate/Durability	Low	5,483	SqFt	4.8%
THANG01	01	AC	114,229	52	RAVELING	Climate/Durability	Medium	49	SqFt	0.0%
THANG01	01	AC	114,229	57	WEATHERING	Climate/Durability	Low	62,198	SqFt	54.5%
THANG01	01	AC	114,229	57	WEATHERING	Climate/Durability	Medium	14,977	SqFt	13.1%
THANG02	01	AC	160,823	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	895	Ft	0.6%
THANG02	01	AC	160,823	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	124	Ft	0.1%
THANG02	01	AC	160,823	57	WEATHERING	Climate/Durability	Low	14,412	SqFt	9.0%
THANG02	01	AC	160,823	57	WEATHERING	Climate/Durability	Medium	2,858	SqFt	1.8%
THANG02	02	AC	87,200	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	380	Ft	0.4%
THANG02	02	AC	87,200	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	207	Ft	0.2%
THANG02	02	AC	87,200	57	WEATHERING	Climate/Durability	Low	9,375	SqFt	10.8%
THANG02	02	AC	87,200	57	WEATHERING	Climate/Durability	Medium	2,476	SqFt	2.8%

[1] AC = Asphalt Cement Concrete, AAC = Aphalt Overlay AC, PCC = Portland Cement Concrete, APC = Asphalt Overlay PCC

[2] LCD = Last construction date. The date of the last major pavement rehabilitation (e.g. AC overlay)

APPENDIX F

INVENTORY

F1: Section Forecasted Pavement Condition Rating
F2: Branch PCI Rating
F3: Branch FOD Rating

Appendix F1

Forecasted Section PCI

Jack Edwards National Airport (JKA)

Branch ID	Section ID	Forecasted PCI						
		2021	2022	2023	2024	2025	2026	2027
A01	01	60	58	56	54	52	49	47
A01	02	63	61	59	57	55	52	50
A01	03	67	65	63	61	59	56	54
A02	01	58	56	54	52	50	47	45
A03	01	69	67	65	63	61	58	56
A03	02	81	79	77	75	73	70	68
A04	01	86	84	82	80	78	75	73
R0927	01	76	73	71	70	70	69	66
R0927	02	64	56	51	47	43	38	34
R1735	01	80	77	73	71	70	70	70
R1735	02	55	51	47	43	38	34	30
R1735	03	60	54	50	45	41	37	32
R1735	04	89	85	82	78	74	72	70
T01	01	53	49	46	43	40	36	33
TA	01	69	65	61	56	51	47	45
TA	02	80	78	76	74	72	69	66
TA	03	81	79	77	75	73	70	67
TA	04	62	58	53	48	45	43	39
TA1	01	64	59	54	49	46	44	40
TA2	01	60	55	50	46	45	41	37
TA3	01	58	53	48	45	43	39	36
TA4	01	64	59	54	49	46	44	40
TA5	01	55	51	47	45	41	38	34
TC	01	69	65	61	56	51	47	45
TC	02	98	96	94	92	89	86	84
TC01	01	89	86	84	81	79	77	75
TC02	01	69	65	61	56	51	47	45
TC1	01	85	83	80	78	76	74	72
TC1	02	87	84	82	80	78	76	74
TC2	01	86	83	81	79	77	75	73
TE	01	85	83	80	78	76	74	72
TE1	01	88	85	83	81	79	77	75
TF	01	85	83	80	78	76	74	72
TF	02	86	83	81	79	77	75	73
THANG01	01	72	70	66	62	57	52	48
THANG02	01	91	89	86	83	81	79	77
THANG02	02	88	85	83	81	79	77	75

Branch Condition Report

Pavement Database: ALDOT_Combined_201201

Branch ID	Number of Sections	Sum Section Length (Ft)	Avg Section Width (Ft)	True Area (SqFt)	Use	Average PCI	Standard Deviation PCI	Weighted Average PCI
A01	3	1,600.00	255.00	425,345.00	APRON	66.33	2.87	65.92
A02	1	130.00	75.00	16,338.00	APRON	61.00	0.00	61.00
A03	2	318.00	117.50	58,994.00	APRON	78.00	6.00	83.04
A04	1	290.00	180.00	55,884.00	APRON	89.00	0.00	89.00
R0927	2	6,962.00	100.00	696,200.00	RUNWAY	74.50	5.50	69.74
R1735	4	3,496.00	75.00	262,239.00	RUNWAY	77.50	11.32	87.41
T01	1	365.00	40.00	38,560.00	TAXIWAY	59.00	0.00	59.00
TA	4	6,989.00	50.00	363,397.00	TAXIWAY	76.50	7.23	69.01
TA1	1	325.00	50.00	21,221.00	TAXIWAY	68.00	0.00	68.00
TA2	1	332.00	48.00	27,287.00	TAXIWAY	65.00	0.00	65.00
TA3	1	332.00	48.00	27,301.00	TAXIWAY	63.00	0.00	63.00
TA4	1	332.00	48.00	27,286.00	TAXIWAY	68.00	0.00	68.00
TA5	1	200.00	50.00	12,855.00	TAXIWAY	61.00	0.00	61.00
TC	2	2,160.00	30.00	67,552.00	TAXIWAY	85.50	13.50	87.45
TC01	1	183.00	35.00	8,460.00	TAXIWAY	92.00	0.00	92.00
TC02	1	185.00	35.00	8,043.00	TAXIWAY	72.00	0.00	72.00
TC1	2	494.00	35.00	13,579.00	TAXIWAY	89.00	1.00	88.96
TC2	1	162.00	30.00	10,296.00	TAXIWAY	89.00	0.00	89.00
TE	1	2,112.00	35.00	75,147.00	TAXIWAY	88.00	0.00	88.00
TE1	1	161.00	35.00	8,867.00	TAXIWAY	91.00	0.00	91.00
TF	2	1,494.00	35.00	61,071.00	TAXIWAY	88.50	0.50	88.20
THANG01	1	4,355.00	25.00	114,229.00	TAXIWAY	75.00	0.00	75.00
THANG02	2	5,900.00	42.50	248,023.00	TAXIWAY	92.50	1.50	92.95

Pavement Database: ALDOT_Combined_201201

Use Category	Number of Sections	Total Area (SqFt)	Arithmetic Average PCI	Average STD PCI	Weighted Average PCI
APRON	7	556,561.00	72.14	9.82	69.91
RUNWAY	6	958,439.00	76.50	9.88	74.58
TAXIWAY	24	1,133,174.00	79.50	11.91	78.31
ALL	37	2,648,174.00	77.62	11.59	75.19

APPENDIX G

SAFETY AND PREVENTIVE MAINTENANCE POLICIES

Appendix G1
Localized Safety (Stopgap) Repair Policy

Distress	Distress Severity	Description	Code	Work Type	Work Unit
41	High	ALLIGATOR CR	PA-FD	Patching - AC Full-Depth	SqFt
43	High	BLOCK CR	CS-AC	Crack Sealing - AC	Ft
45	High	DEPRESSION	PA-FD	Patching - AC Full-Depth	SqFt
47	High	JT REF. CR	CS-AC	Crack Sealing - AC	Ft
48	High	L & T CR	CS-AC	Crack Sealing - AC	Ft
50	High	PATCHING	PA-FD	Patching - AC Full-Depth	SqFt
53	High	RUTTING	PA-FD	Patching - AC Full-Depth	SqFt
54	High	SHOVING	PA-PD	Patching - AC Partial-Depth	SqFt
55	NA	SLIPPAGE CR	PA-PD	Patching - AC Partial-Depth	SqFt
56	High	SWELLING	PA-FD	Patching - AC Full-Depth	SqFt
61	High	BLOW-UP	SL-PC	Slab Replacement - PCC	SqFt
61	Medium	BLOW-UP	PA-PF	Patching - PCC Full Depth	SqFt
62	High	CORNER BREAK	PA-PF	Patching - PCC Full Depth	SqFt
63	High	LINEAR CR	PA-PF	Patching - PCC Full Depth	SqFt
63	Medium	LINEAR CR	CS-PC	Crack Sealing - PCC	Ft
64	High	DURABIL. CR	SL-PC	Slab Replacement - PCC	SqFt
64	Medium	DURABIL. CR	PA-PF	Patching - PCC Full Depth	SqFt
66	High	SMALL PATCH	PA-PP	Patching - PCC Partial Depth	SqFt
67	High	LARGE PATCH	PA-PF	Patching - PCC Full Depth	SqFt
70	High	SCALING	SL-PC	Slab Replacement - PCC	SqFt
71	High	FAULTING	GR-PP	Grinding (Localized)	Ft
72	High	SHAT. SLAB	SL-PC	Slab Replacement - PCC	SqFt
74	High	JOINT SPALL	PA-PP	Patching - PCC Partial Depth	SqFt
75	High	CORNER SPALL	PA-PP	Patching - PCC Partial Depth	SqFt
76	High	ASR	SL-PC	Slab Replacement - PCC	SqFt

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APPENDIX H

M&R UNIT COSTS

H1: M&R Unit Costs
H2: Component Costs for Repair
H3: Airport Category

Maintenance and Repair (M&R) Unit Costs

The M&R costs developed for the ALDOT PMP include costs for maintenance, preservation, and repair activities and are described below.

Unit Costs Source Data

The source for the M&R costs data is RSMeans, which has data for 14 locations throughout Alabama, as identified by the yellow highlighted boxes in Figure 1. The cost data is presented in terms of individual line items like asphalt wearing course, aggregate base etc., which were consolidated to develop the activity costs described below.

The cost data show a distinct difference in costs between locations north and south of Birmingham, especially for the higher value items like the asphalt layers. Therefore, the unit costs were developed accordingly for the airports north and south of Birmingham, as identified in Figure 1. Appendix H2 presents the component costs used in developing the M&R costs.

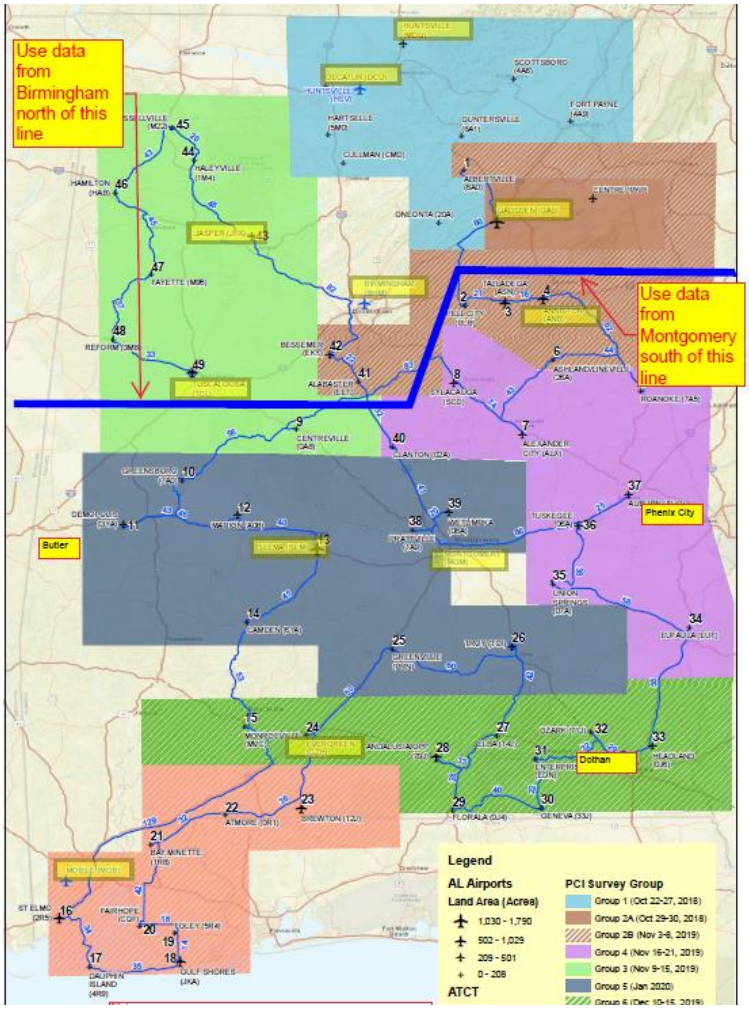

Figure 1: RSMeans Unit Costs Locations.

Maintenance & Repair (M&R) Activities

Maintenance activities are localized activities which are typically assigned in the first year of the M&R plan based on the observed distresses.

Repair activities are further subdivided into preservation, rehabilitation, and reconstruction. Repair activities are conducted for larger areas, typically at the section level and are assigned based on the /ǈʎǘʎŎl·ƒ tl·ǾŜΥŜyǘ /ƻyŘʎǘʎƻyƳ LyŘŜȄ ŘŜyƻǘŜŘ l·ǎ /t ʎyƳ¢l·ōƒŜ мύ ¢KŜ /t ʎǎ ōl·ǎŜŘ ƻyƳǘKŜ ǎŜŎǘʎƻyΩǎ ǈl·yƙ ƻǈ importance within the overall network and typically ranges from 55 to 70. The CP was set at 70 for the ALDOT runway pavements and 65 for the other pavements.

Table 1: Repair Activities.

Activity Type	PCI	Activity
Preservation	> CP	Runway Surface Treatment
		Taxiway and Apron Surface Treatment
Rehabilitation	> CP	2" AC OL[1]
	55 - CP	Mill 2" & 2" AC OL
	45 - 55	Mill 2" & 3" AC OL
Reconstruction	0 - 45	Reconstruct with AC

[1]For Sections with Structural Distress and PCI greater than Critical PCI

The depths for the milling and overlay (AC OL) in Table 1 were established by creating a balance between removal of surficial distress and providing additional pavement structural capacity. All overlay options include full-depth patching to repair localized distresses.

From the FAA 5010 records, the Alabama airport network includes a wide range of allowable aircraft loads. The airports were divided into three categories of allowable aircraft loads based on requirements for minimum pavement thickness and the use of a P-401 surface layer. The categories are based on the aircraft maximum gross takeoff weight (MGTOW) and include: less than 12,500 lbs, 12,500 to 30,000 lbs, and 30,000 to 100,000 lbs. Appendix H3 presents the category for each airport.

For any sections requiring reconstruction, the pavement sections were established primarily in accordance with the requirements iyƳ¢l·ōƒŜ o ƻǈ ǘKŜ C!!Ωǎ !ŘǾʎǎƻǈè /ʎǈŎǳƒl·ǈ 150/5320-6F. The pavement sections used for developing the cost estimates are:

- Җ м2,500 lbs 4ɠ t-403 (State HMA Mix) + 6ɠ P-209 Base
- 12,500 ς 30,000 lbs пɠ t-403 (State HMA Mix) + 8ɠ t-209 Base
- 30,000 ς 100,000 lbs pɠ t-401 + 10ɠ t-209 Base

It is important to note that while the FAA requires a stabilized base for those pavements that support aircraft operations with MGTOWs that are greater than 100,000 lbs, the number of such operations is minimal for those airports shown in Appendix H3. As a result, the cost of a stabilized base is excluded in ǘKŜ ŘŜǾŜƒƻǇΥŜyǘ ƻǈ ǘKŜ ǳyʎǘ Ŏƻǎǘǎ ǈƻǈ ![5h¢Ωǎ tat ǳǇŘl·ǘŜύ Iƻǿ ŜǾŜǈΣ ōl·ǎŜŘ ƻyƳǘKŜ 9yƎʎyŜŜǈΩǎ ǈǳǘǳǈŜ design and aircraft fleet mix development, project-level construction work could include the use of a stabilized base at that time.

M&R Unit Costs

Paving projects typically include additional project costs like mobilization, design, construction administration and inspections, and drainage improvements. A summary of non-direct pavement construction line items has been included in the unit costs in Tables 5 and 6 as described below. These non-direct items are expressed as a percentage of the total component costs for each activity.

These non-Ř⅄ⅈⅇŜŏű ⅃Ⅼ⅂·ØŜϒŝyű ŏ2yãúⅈⅇdzŎú⅄ⅇ2yˇ⅄úŜϒă ø ŜⅈⅇŜ ŘŜØŜf2⅃ŜŘ ₸ⅈⅇ2ϒ ! t⅃ⅇăŜÈúŜyã⅄ØŜ ŜÈ⅃Ŝⅈⅇ⅄ŜyŎŜ ø⅄úK APMP project cost estimation. These percentages may vary for Alabama airport construction projects; however, since the direct pavement scope of work is estimated in a network-level evaluation, these conservative estimates serve as a good starting point for the development of realistic total project costs and annual APMP budgets for ALDOT. For repair activities such as Mill & Overlay, which typically do not include significant drainage work, the corresponding multiplier was reduced by 50 percent. The non-direct cost factors are presented in Table 2.

Table 2: Cost Factors.

Factor	Function of	Estimate		
		Preservation	Rehabilitation	Reconstruction
Mobilization	All costs, less design	10%	10%	10%
Drainage Improvements	Paving costs	-	4%	8%
Contingency	All costs, less mobilization and design	10%	20%	20%
Design & CM	All costs, less mobilization and design	15%	20%	20%

The M&R unit costs for maintenance, preservation, and repair activities were developed from the RSMeans cost data and are presented in the following section.

Maintenance

The maintenance activities include crack seal, and full and partial-depth patching. The unit costs are presented in Table 3.

Table 3: Unit Costs for Maintenance.

Activity	Unit Cost	Unit
Seal Cracks - AC	$3.95	lf
AC Full-Depth Patching	$25.05	sf
AC Partial-Dept Patching	$16.28	sf
Seal Cracks ς PCC	$6.00	lf
PCC Full-Depth Patching	$35.00	sf
PCC Partial-Depth Patching	$175.00	sf
Jt. Seal	$8.00	lf
Slab Replacement	$20.00	sf

Preservation

The unit costs for the surface treatments are presented in Table 4. They include sealing of cracks and application of pavement markings.

Table 4: Unit Costs for Preservation Activities.

Activity	Unit Cost	Unit
Runway Surface Treatment	$0.57	sf
Taxiway and Apron Surface Treatment	$0.88	sf

Rehabilitation and Reconstruction

As discussed previously, repair activities are also divided into rehabilitation and reconstruction. The unit costs for airport repair for the Northern Region (Birmingham Area) and Southern Region (Montgomery Area) are shown in Tables 5 and 6, respectively.

Table 5: Unit Costs for Repair Activities, Northern Region.

Activity Type	Activity	MGTOW, thousand lbs		
		≤ 2.5	12.5-30	30-100
Rehabilitation	2" AC OL	$3.78		$4.19
	Mill 2" & 2" AC OL	$4.15		$4.56
	Mill 2" & 3" AC OL	$5.18		$5.79
Reconstruction	AC Reconstruction	$8.40	$9.10	$10.91

Table 6: Unit Costs for Repair Activities, Southern Region.

Activity Type	Activity	MGTOW, thousand lbs		
		≤ 2.5	12.5-30	30-100
Rehabilitation	2" AC OL	$3.54		$3.91
	Mill 2" & 2" AC OL	$3.90		$4.27
	Mill 2" & 3" AC OL	$4.82		$5.37
Reconstruction	AC Reconstruction	$7.63	$8.25	$9.87

Appendix H2
Component Costs for Repair

Activity Type	Unit	Birmingham (Northern)	Montgomery (Southern)	Comments
Milling 1" to 3"	SY	$2.08	$2.01	
Pavement Demolition	SY	$6.34	$6.12	
Haulage - For Demolition & AC	CY	$6.08	$5.87	
Haulage for 12" Thick Demolition	SY	$2.03	$1.96	
Haulage for 2" Thick AC Paving	SY	$0.34	$0.33	
Haulage for 3" Thick AC Paving	SY	$0.51	$0.49	
Haulage for 4" Thick AC Paving	SY	$0.68	$0.65	
AC Wearing Course	Ton	$97.42	$86.90	
AC Binder Course	Ton	$87.80	$78.17	
P401 - For airports with >60 kip aircraft	Ton	$116.90	$104.28	Assumed P401 cost to be 20% greater than AC Wearing Course
6" Aggregate Base (P208)	SY	$10.17	$9.12	
8" Aggregate Base (P208)	SY	$13.29	$11.89	
6" P209 Aggregate Base	SY	$12.20	$10.94	Assumed P209 cost to be 20% greater than P208
8" P209 Aggregate Base	SY	$15.95	$14.27	Assumed P209 cost to be 20% greater than P208
10" P209 Aggregate Base	SY	$19.94	$17.84	Direct multiplier for 10" from 8"
4" P154 Aggregate Base	SY	$5.42	$4.86	Assumed P154 cost to be 20% lower than P208
6" P154 Aggregate Base	SY	$8.14	$7.30	Assumed P154 cost to be 20% lower than P208
Pavement Markings	sf	$1.48	$1.39	

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APPENDIX I

PAVEMENT CAPITAL IMPROVEMENT PROGRAM

I1: PCIP Summary
I2: Year 1 Maintenance Plan

Jack Edwards National Airport (JKA)

Branch & Section	2021	2022	2023	2024	2025	2026	2027
A01-01	StopGap $3425.97 Before:59.51 After:59.51	StopGap $3875.51 Before:57.3 After:57.3	Required Project Major Below Critical $764099.86 Before:55.09 After:100	Preventive $406.16 Before:97.78 After:97.78	Preventive $834.97 Before:95.57 After:95.57	Preventive + Required Project Global MR $112788.75 Before:93.36 After:97.79	Preventive $884 Before:95.58 After:95.58
A01-02	StopGap $2620.86 Before:62.51 After:62.51	StopGap $3040.42 Before:60.3 After:60.3	Required Project Major Below Critical $683272.19 Before:58.09 After:100	Preventive $363.19 Before:97.78 After:97.78	Preventive $746.65 Before:95.57 After:95.57	Preventive + Required Project Global MR $100857.78 Before:93.36 After:97.79	Preventive $790.49 Before:95.58 After:95.58
A01-03	Preventive $5420.93 Before:66.51 After:66.51	StopGap $1896.32 Before:64.3 After:64.3	Required Project Major Below Critical $534734.76 Before:62.09 After:100	Preventive $284.24 Before:97.78 After:97.78	Preventive $584.33 Before:95.57 After:95.57	Preventive + Required Project Global MR $78932.18 Before:93.36 After:97.79	Preventive $618.65 Before:95.58 After:95.58
A02-01	StopGap $371.72 Before:57.51 After:57.51	StopGap $417.42 Before:55.3 After:55.3	Required Project Major Below Critical $95740.68 Before:53.09 After:100	Preventive $40.47 Before:97.78 After:97.78	Preventive $83.2 Before:95.57 After:95.57	Preventive + Required Project Global MR $11238.29 Before:93.36 After:97.79	Preventive $88.08 Before:95.58 After:95.58

Jack Edwards National Airport (JKA)

Branch & Section	2021	2022	2023	2024	2025	2026	2027
A03-01	Preventive $174.73 Before:68.51 After:68.51	Preventive $233.58 Before:66.3 After:66.3	Required Project Major Below Critical $21883.36 Before:64.09 After:100	Preventive $11.63 Before:97.78 After:97.78	Preventive $23.91 Before:95.57 After:95.57	Preventive + Required Project Global MR $3230.2 Before:93.36 After:97.79	Preventive $25.32 Before:95.58 After:95.58
A03-02	Preventive + Required Project Global MR $48863.77 Before:80.51 After:87.14	Preventive $861.46 Before:84.93 After:84.93	Preventive $1017.35 Before:82.72 After:82.72	Preventive $1182.37 Before:80.5 After:80.5	Preventive $1346.15 Before:78.29 After:78.29	Preventive $1515.78 Before:76.08 After:76.08	Preventive $1694.36 Before:73.87 After:73.87
A04-01	Preventive + Required Project Global MR $50005.49 Before:85.51 After:92.14	Preventive $592.51 Before:89.93 After:89.93	Preventive $744.13 Before:87.72 After:87.72	Preventive $904.88 Before:85.5 After:85.5	Preventive $1074.02 Before:83.29 After:83.29	Preventive $1252.49 Before:81.08 After:81.08	Preventive $1433.89 Before:78.87 After:78.87
R0927-01	Required Project Major Above Critical $206360 Before:74.27 After:100	Preventive $64.18 Before:98.7 After:98.7	Preventive $128.04 Before:97.48 After:97.48	Preventive + Required Project Global MR $30201.69 Before:96.45 After:98.7	Preventive $135.84 Before:97.48 After:97.48	Preventive $196.99 Before:96.45 After:96.45	Preventive $260.13 Before:95.45 After:95.45

Jack Edwards National Airport (JKA)

Branch & Section	2021	2022	2023	2024	2025	2026	2027
R0927-02	Required Project Major Below Critical $2856920 Before:59.96 After:100	Preventive $888.48 Before:98.7 After:98.7	Preventive $1772.68 Before:97.48 After:97.48	Preventive + Required Project Global MR $418122.7 Before:96.45 After:98.7	Preventive $1880.63 Before:97.48 After:97.48	Preventive $2727.26 Before:96.45 After:96.45	Preventive $3601.38 Before:95.45 After:95.45
R1735-01	Preventive + Required Project Global MR $37626.59 Before:78.81 After:86.55	Preventive $1134.24 Before:82.77 After:82.77	Preventive $1429.04 Before:78.82 After:78.82	Preventive $1703.69 Before:75.17 After:75.17	Preventive $1943.16 Before:72.29 After:72.29	Preventive $2122.04 Before:70.5 After:70.5	StopGap $775.75 Before:69.84 After:69.84
R1735-02	Required Project Major Below Critical $82950 Before:53.66 After:100	Preventive $20.53 Before:98.7 After:98.7	Preventive $40.95 Before:97.48 After:97.48	Preventive + Required Project Global MR $9659.39 Before:96.45 After:98.7	Preventive $43.45 Before:97.48 After:97.48	Preventive $63 Before:96.45 After:96.45	Preventive $83.2 Before:95.45 After:95.45
R1735-03	Required Project Major Below Critical $66171.6 Before:56.29 After:100	Preventive $20.58 Before:98.7 After:98.7	Preventive $41.06 Before:97.48 After:97.48	Preventive + Required Project Global MR $9684.5 Before:96.45 After:98.7	Preventive $43.56 Before:97.48 After:97.48	Preventive $63.17 Before:96.45 After:96.45	Preventive $83.41 Before:95.45 After:95.45

Jack Edwards National Airport (JKA)

Branch & Section	2021	2022	2023	2024	2025	2026	2027
R1735-04	Preventive + Required Project Global MR $100570.44 Before:87.46 After:92.9	Preventive $1688.32 Before:90.55 After:90.55	Preventive $2304.13 Before:87.47 After:87.47	Preventive $3072.49 Before:83.78 After:83.78	Preventive $3930.99 Before:79.84 After:79.84	Preventive $4737.75 Before:76.07 After:76.07	Preventive $5468.93 Before:72.94 After:72.94
T01-01	StopGap $1101.57 Before:51.25 After:51.25	Required Project Major Below Critical $219406.4 Before:47.12 After:100	Preventive $42.57 Before:98.98 After:98.98	Preventive $92.77 Before:97.85 After:97.85	Preventive + Required Project Global MR $25612.49 Before:96.33 After:98.98	Preventive $98.42 Before:97.85 After:97.85	Preventive $172.81 Before:96.33 After:96.33
TA-01	StopGap $550.91 Before:67.19 After:67.19	Required Project Major Below Critical $190649.58 Before:63.25 After:100	Preventive $46.46 Before:98.98 After:98.98	Preventive $101.26 Before:97.85 After:97.85	Preventive + Required Project Global MR $27954.55 Before:96.33 After:98.98	Preventive $107.42 Before:97.85 After:97.85	Preventive $188.61 Before:96.33 After:96.33
TA-02	Preventive + Required Project Global MR $15000.47 Before:79.53 After:86.56	Preventive $280.11 Before:84.02 After:84.02	Preventive $330.85 Before:81.67 After:81.67	Preventive $379.66 Before:79.54 After:79.54	Preventive $425.52 Before:77.56 After:77.56	Preventive $473.61 Before:75.59 After:75.59	Preventive $527.17 Before:73.46 After:73.46

Jack Edwards National Airport (JKA)

Branch & Section	2021	2022	2023	2024	2025	2026	2027
TA-03	Preventive + Required Project Global MR $13368.28 Before:80.39 After:87.66	Preventive $233.52 Before:85.06 After:85.06	Preventive $279.9 Before:82.62 After:82.62	Preventive $325.09 Before:80.4 After:80.4	Preventive $366.99 Before:78.37 After:78.37	Preventive $409.2 Before:76.42 After:76.42	Preventive $455.08 Before:74.38 After:74.38
TA-04	StopGap $5802.11 Before:60.41 After:60.41	Required Project Major Below Critical $1312825.71 Before:55.54 After:100	Preventive $319.91 Before:98.98 After:98.98	Preventive $697.27 Before:97.85 After:97.85	Preventive + Required Project Global MR $192496.87 Before:96.33 After:98.98	Preventive $739.73 Before:97.85 After:97.85	Preventive $1298.8 Before:96.33 After:96.33
TA1-01	Required Project Major Below Critical $93372.4 Before:61.72 After:100	Preventive $22.74 Before:98.98 After:98.98	Preventive $49.57 Before:97.85 After:97.85	Preventive + Required Project Global MR $13668.47 Before:96.33 After:98.98	Preventive $52.59 Before:97.85 After:97.85	Preventive $92.33 Before:96.33 After:96.33	Preventive $145.95 Before:94.36 After:94.36
TA2-01	Required Project Major Below Critical $120062.8 Before:57.89 After:100	Preventive $29.24 Before:98.98 After:98.98	Preventive $63.74 Before:97.85 After:97.85	Preventive + Required Project Global MR $17575.59 Before:96.33 After:98.98	Preventive $67.62 Before:97.85 After:97.85	Preventive $118.73 Before:96.33 After:96.33	Preventive $187.67 Before:94.36 After:94.36

Jack Edwards National Airport (JKA)

Branch & Section	2021	2022	2023	2024	2025	2026	2027
TA3-01	Required Project Major Below Critical $120124.4 Before:55.51 After:100	Preventive $29.26 Before:98.98 After:98.98	Preventive $63.77 Before:97.85 After:97.85	Preventive + Required Project Global MR $17584.61 Before:96.33 After:98.98	Preventive $67.66 Before:97.85 After:97.85	Preventive $118.79 Before:96.33 After:96.33	Preventive $187.77 Before:94.36 After:94.36
TA4-01	Required Project Major Below Critical $120058.4 Before:61.72 After:100	Preventive $29.24 Before:98.98 After:98.98	Preventive $63.74 Before:97.85 After:97.85	Preventive + Required Project Global MR $17574.95 Before:96.33 After:98.98	Preventive $67.62 Before:97.85 After:97.85	Preventive $118.72 Before:96.33 After:96.33	Preventive $187.67 Before:94.36 After:94.36
TA5-01	Required Project Major Below Critical $71088.15 Before:53.3 After:100	Preventive $13.78 Before:98.98 After:98.98	Preventive $30.03 Before:97.85 After:97.85	Preventive + Required Project Global MR $8279.92 Before:96.33 After:98.98	Preventive $31.86 Before:97.85 After:97.85	Preventive $55.93 Before:96.33 After:96.33	Preventive $88.41 Before:94.36 After:94.36
TC-01	StopGap $378.37 Before:67.19 After:67.19	StopGap $509.48 Before:63.25 After:63.25	Required Project Major Below Critical $134697.3 Before:58.66 After:100	Preventive $33.16 Before:98.97 After:98.97	Preventive $71.63 Before:97.85 After:97.85	Preventive + Required Project Global MR $19781.17 Before:96.33 After:98.97	Preventive $75.99 Before:97.85 After:97.85

Jack Edwards National Airport (JKA)

Branch & Section	2021	2022	2023	2024	2025	2026	2027
TC-02	Preventive + Required Project Global MR $34125.33 Before:97.06 After:100	Preventive $41.42 Before:98.98 After:98.98	Preventive $90.28 Before:97.85 After:97.85	Preventive $158.5 Before:96.33 After:96.33	Preventive $251.35 Before:94.35 After:94.35	Preventive $366.7 Before:91.99 After:91.99	Preventive $500.31 Before:89.39 After:89.39
TC01-01	Preventive + Required Project Global MR $7549.73 Before:87.86 After:95.25	Preventive $62.01 Before:93.04 After:93.04	Preventive $86.97 Before:90.52 After:90.52	Preventive $114.57 Before:87.87 After:87.87	Preventive $143.39 Before:85.26 After:85.26	Preventive $172.3 Before:82.81 After:82.81	Preventive $200.46 Before:80.58 After:80.58
TC02-01	StopGap $105.28 Before:67.19 After:67.19	StopGap $141.77 Before:63.25 After:63.25	Required Project Major Below Critical $37480.38 Before:58.66 After:100	Preventive $9.23 Before:98.97 After:98.97	Preventive $19.93 Before:97.85 After:97.85	Preventive + Required Project Global MR $5504.24 Before:96.33 After:98.97	Preventive $21.15 Before:97.85 After:97.85
TC1-01	Preventive + Required Project Global MR $6300.97 Before:83.93 After:91.73	Preventive $80.51 Before:89.12 After:89.12	Preventive $103.02 Before:86.48 After:86.48	Preventive $126.16 Before:83.93 After:83.93	Preventive $148.83 Before:81.59 After:81.59	Preventive $170.56 Before:79.47 After:79.47	Preventive $191.11 Before:77.49 After:77.49
TC1-02	Preventive + Required Project Global MR $5858.87 Before:85.83 After:93.56	Preventive $61.36 Before:91.1 After:91.1	Preventive $81.86 Before:88.47 After:88.47	Preventive $103.66 Before:85.83 After:85.83	Preventive $125.54 Before:83.34 After:83.34	Preventive $147.08 Before:81.05 After:81.05	Preventive $167.34 Before:78.97 After:78.97

Jack Edwards National Airport (JKA)

Branch & Section	2021	2022	2023	2024	2025	2026	2027
TC2-01	Preventive + Required Project Global MR $9219.65 Before:84.87 After:92.66	Preventive $107.19 Before:90.11 After:90.11	Preventive $139.94 Before:87.46 After:87.46	Preventive $174.03 Before:84.86 After:84.86	Preventive $208 Before:82.44 After:82.44	Preventive $241.07 Before:80.24 After:80.24	Preventive $271.6 Before:78.22 After:78.22
TE-01	Preventive + Required Project Global MR $67363.67 Before:83.93 After:91.73	Preventive $860.74 Before:89.12 After:89.12	Preventive $1101.35 Before:86.48 After:86.48	Preventive $1348.76 Before:83.93 After:83.93	Preventive $1591.17 Before:81.59 After:81.59	Preventive $1823.43 Before:79.47 After:79.47	Preventive $2043.19 Before:77.49 After:77.49
TE1-01	Preventive + Required Project Global MR $7922.32 Before:86.83 After:94.42	Preventive $73.99 Before:92.07 After:92.07	Preventive $101.11 Before:89.48 After:89.48	Preventive $130.43 Before:86.83 After:86.83	Preventive $160.4 Before:84.27 After:84.27	Preventive $190.14 Before:81.9 After:81.9	Preventive $218.86 Before:79.75 After:79.75
TF-01	Preventive + Required Project Global MR $43931.11 Before:83.93 After:91.73	Preventive $561.33 Before:89.12 After:89.12	Preventive $718.25 Before:86.48 After:86.48	Preventive $879.59 Before:83.93 After:83.93	Preventive $1037.68 Before:81.59 After:81.59	Preventive $1189.15 Before:79.47 After:79.47	Preventive $1332.46 Before:77.49 After:77.49

Jack Edwards National Airport (JKA)

Branch & Section	2021	2022	2023	2024	2025	2026	2027
TF-02	Preventive + Required Project Global MR $10802.82 Before:84.87 After:92.66	Preventive $125.6 Before:90.11 After:90.11	Preventive $163.97 Before:87.46 After:87.46	Preventive $203.91 Before:84.86 After:84.86	Preventive $243.71 Before:82.44 After:82.44	Preventive $282.47 Before:80.24 After:80.24	Preventive $318.24 Before:78.22 After:78.22
THANG01-01	Preventive $3259.01 Before:71.29 After:71.29	Preventive $4525.26 Before:68.26 After:68.26	StopGap $1913.95 Before:64.55 After:64.55	Required Project Major Below Critical $548299.2 Before:60.13 After:100	Preventive $133.77 Before:98.98 After:98.98	Preventive $291.57 Before:97.85 After:97.85	Preventive $511.93 Before:96.33 After:96.33
THANG02-01	Preventive + Required Project Global MR $143154.3 Before:90.08 After:96.78	Preventive $860.25 Before:94.92 After:94.92	Preventive $1280.75 Before:92.65 After:92.65	Preventive $1779.57 Before:90.09 After:90.09	Preventive $2323.99 Before:87.44 After:87.44	Preventive $2887.35 Before:84.85 After:84.85	Preventive $3448.52 Before:82.43 After:82.43
THANG02-02	Preventive + Required Project Global MR $77909.86 Before:86.83 After:94.42	Preventive $727.61 Before:92.07 After:92.07	Preventive $994.38 Before:89.48 After:89.48	Preventive $1282.7 Before:86.83 After:86.83	Preventive $1577.4 Before:84.27 After:84.27	Preventive $1869.84 Before:81.9 After:81.9	Preventive $2152.28 Before:79.75 After:79.75

Appendix I2

Localized Maintenance Plan

Jack Edwards National Airport (JKA)

Branch ID	Section ID	Policy	Distress Code	Description	Severity	Distress Qty	Distress Unit	Percent Distress	Work Description	Work Qty	Work Unit	Unit Cost	Work Cost
A01	01	Safety	48	L & T CR	Medium	7,272	Ft	4.43	No Localized M & R	0		$0.00	$0
A01	01	Safety	48	L & T CR	Low	3,874	Ft	2.36	No Localized M & R	0		$0.00	$0
A01	01	Safety	52	RAVELING	Low	3,205	SqFt	1.95	No Localized M & R	0		$0.00	$0
A01	01	Safety	57	WEATHERING	Low	88,942	SqFt	54.24	No Localized M & R	0		$0.00	$0
A01	01	Safety	57	WEATHERING	Medium	21,635	SqFt	13.19	No Localized M & R	0		$0.00	$0
A01	02	Preventive	48	L & T CR	Low	2,983	Ft	2.03	No Localized M & R	0		$0.00	$0
A01	02	Preventive	48	L & T CR	Medium	6,316	Ft	4.31	Crack Sealing - AC	6,316	Ft	$3.95	$24,949
A01	02	Preventive	57	WEATHERING	Low	85,719	SqFt	58.46	No Localized M & R	0		$0.00	$0
A01	02	Preventive	57	WEATHERING	Medium	5,013	SqFt	3.42	No Localized M & R	0		$0.00	$0
A01	03	Preventive	48	L & T CR	Medium	3,375	Ft	2.94	Crack Sealing - AC	3,375	Ft	$3.95	$13,331
A01	03	Preventive	48	L & T CR	Low	2,615	Ft	2.28	No Localized M & R	0		$0.00	$0
A01	03	Preventive	57	WEATHERING	Medium	4,950	SqFt	4.31	No Localized M & R	0		$0.00	$0
A01	03	Preventive	57	WEATHERING	Low	57,600	SqFt	50.2	No Localized M & R	0		$0.00	$0
A02	01	Safety	43	BLOCK CR	Low	2,800	SqFt	17.14	No Localized M & R	0		$0.00	$0
A02	01	Safety	48	L & T CR	Low	180	Ft	1.1	No Localized M & R	0		$0.00	$0
A02	01	Safety	48	L & T CR	Medium	27	Ft	0.17	No Localized M & R	0		$0.00	$0
A02	01	Safety	50	PATCHING	Medium	200	SqFt	1.22	No Localized M & R	0		$0.00	$0
A02	01	Safety	52	RAVELING	Low	2,000	SqFt	12.24	No Localized M & R	0		$0.00	$0
A02	01	Safety	52	RAVELING	High	300	SqFt	1.84	No Localized M & R	0		$0.00	$0
A02	01	Safety	57	WEATHERING	Medium	4,150	SqFt	25.4	No Localized M & R	0		$0.00	$0
A02	01	Safety	57	WEATHERING	Low	3,500	SqFt	21.42	No Localized M & R	0		$0.00	$0
A03	01	Preventive	48	L & T CR	Low	46	Ft	0.98	No Localized M & R	0		$0.00	$0
A03	01	Preventive	48	L & T CR	Medium	88	Ft	1.87	Crack Sealing - AC	88	Ft	$3.95	$348
A03	01	Preventive	57	WEATHERING	Medium	400	SqFt	8.52	No Localized M & R	0		$0.00	$0
A03	01	Preventive	57	WEATHERING	Low	2,000	SqFt	42.59	No Localized M & R	0		$0.00	$0
A03	02	Preventive	45	DEPRESSION	Low	101	SqFt	0.19	Patching - AC Full-Depth	145	SqFt	$25.05	$3,636
A03	02	Preventive	48	L & T CR	Low	743	Ft	1.37	No Localized M & R	0		$0.00	$0
A03	02	Preventive	52	RAVELING	Medium	25	SqFt	0.05	No Localized M & R	0		$0.00	$0
A03	02	Preventive	57	WEATHERING	Low	18,134	SqFt	33.4	No Localized M & R	0		$0.00	$0

Appendix I2

Localized Maintenance Plan

Jack Edwards National Airport (JKA)

Branch ID	Section ID	Policy	Distress Code	Description	Severity	Distress Qty	Distress Unit	Percent Distress	Work Description	Work Qty	Work Unit	Unit Cost	Work Cost
A03	02	Preventive	57	WEATHERING	Medium	4,785	SqFt	8.81	No Localized M & R	0		$0.00	$0
A04	01	Preventive	48	L & T CR	High	24	Ft	0.04	Crack Sealing - AC	24	Ft	$3.95	$95
A04	01	Preventive	48	L & T CR	Low	547	Ft	0.98	No Localized M & R	0		$0.00	$0
A04	01	Preventive	48	L & T CR	Medium	144	Ft	0.26	Crack Sealing - AC	144	Ft	$3.95	$569
A04	01	Preventive	57	WEATHERING	Medium	2,401	SqFt	4.3	No Localized M & R	0		$0.00	$0
A04	01	Preventive	57	WEATHERING	Low	4,802	SqFt	8.59	No Localized M & R	0		$0.00	$0
R0927	01	Preventive	48	L & T CR	Low	3,201	Ft	6.83	No Localized M & R	0		$0.00	$0
R0927	01	Preventive	57	WEATHERING	Medium	235	SqFt	0.5	No Localized M & R	0		$0.00	$0
R0927	01	Preventive	57	WEATHERING	Low	4,690	SqFt	10	No Localized M & R	0		$0.00	$0
R0927	02	Safety	48	L & T CR	Medium	3,950	Ft	0.61	No Localized M & R	0		$0.00	$0
R0927	02	Safety	48	L & T CR	Low	49,791	Ft	7.67	No Localized M & R	0		$0.00	$0
R0927	02	Safety	52	RAVELING	Low	547	SqFt	0.08	No Localized M & R	0		$0.00	$0
R0927	02	Safety	57	WEATHERING	Low	375,972	SqFt	57.9	No Localized M & R	0		$0.00	$0
R0927	02	Safety	57	WEATHERING	Medium	41,350	SqFt	6.37	No Localized M & R	0		$0.00	$0
R1735	01	Preventive	48	L & T CR	Low	603	Ft	0.96	No Localized M & R	0		$0.00	$0
R1735	01	Preventive	48	L & T CR	Medium	292	Ft	0.47	Crack Sealing - AC	292	Ft	$3.95	$1,153
R1735	01	Preventive	57	WEATHERING	Low	22,518	SqFt	36	No Localized M & R	0		$0.00	$0
R1735	01	Preventive	57	WEATHERING	Medium	278	SqFt	0.44	No Localized M & R	0		$0.00	$0
R1735	02	Safety	48	L & T CR	Medium	558	Ft	3.72	No Localized M & R	0		$0.00	$0
R1735	02	Safety	48	L & T CR	Low	516	Ft	3.44	No Localized M & R	0		$0.00	$0
R1735	02	Safety	52	RAVELING	Low	201	SqFt	1.34	No Localized M & R	0		$0.00	$0
R1735	02	Safety	57	WEATHERING	Medium	603	SqFt	4.02	No Localized M & R	0		$0.00	$0
R1735	02	Safety	57	WEATHERING	Low	7,032	SqFt	46.88	No Localized M & R	0		$0.00	$0
R1735	03	Safety	48	L & T CR	Low	310	Ft	2.06	No Localized M & R	0		$0.00	$0
R1735	03	Safety	48	L & T CR	Medium	520	Ft	3.46	No Localized M & R	0		$0.00	$0
R1735	03	Safety	57	WEATHERING	Medium	1,400	SqFt	9.31	No Localized M & R	0		$0.00	$0
R1735	03	Safety	57	WEATHERING	Low	4,700	SqFt	31.25	No Localized M & R	0		$0.00	$0
R1735	04	Preventive	48	L & T CR	Low	1,592	Ft	0.94	No Localized M & R	0		$0.00	$0
R1735	04	Preventive	48	L & T CR	Medium	60	Ft	0.04	Crack Sealing - AC	60	Ft	$3.95	$238

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R1735	04	Preventive	57	WEATHERING	Low	21,112	SqFt	12.44	No Localized M & R	0		$0.00	$0
T01	01	Safety	48	L & T CR	Low	555	Ft	1.44	No Localized M & R	0		$0.00	$0
T01	01	Safety	48	L & T CR	Medium	2,481	Ft	6.43	No Localized M & R	0		$0.00	$0
T01	01	Safety	57	WEATHERING	Low	17,634	SqFt	45.73	No Localized M & R	0		$0.00	$0
T01	01	Safety	57	WEATHERING	Medium	6,670	SqFt	17.3	No Localized M & R	0		$0.00	$0
TA	01	Preventive	48	L & T CR	Medium	744	Ft	1.77	Crack Sealing - AC	743	Ft	$3.95	$2,937
TA	01	Preventive	48	L & T CR	Low	1,097	Ft	2.61	No Localized M & R	0		$0.00	$0
TA	01	Preventive	57	WEATHERING	Low	19,640	SqFt	46.67	No Localized M & R	0		$0.00	$0
TA	01	Preventive	57	WEATHERING	Medium	5,611	SqFt	13.33	No Localized M & R	0		$0.00	$0
TA	02	Preventive	48	L & T CR	Medium	105	Ft	0.63	Crack Sealing - AC	105	Ft	$3.95	$415
TA	02	Preventive	48	L & T CR	Low	12	Ft	0.07	No Localized M & R	0		$0.00	$0
TA	02	Preventive	52	RAVELING	Low	127	SqFt	0.76	No Localized M & R	0		$0.00	$0
TA	02	Preventive	57	WEATHERING	Low	9,804	SqFt	58.88	No Localized M & R	0		$0.00	$0
TA	02	Preventive	57	WEATHERING	Medium	1,396	SqFt	8.38	No Localized M & R	0		$0.00	$0
TA	03	Preventive	48	L & T CR	Low	56	Ft	0.37	No Localized M & R	0		$0.00	$0
TA	03	Preventive	48	L & T CR	Medium	99	Ft	0.66	Crack Sealing - AC	99	Ft	3.95	$390
TA	03	Preventive	57	WEATHERING	Medium	493	SqFt	3.32	No Localized M & R	0		0	$0
TA	03	Preventive	57	WEATHERING	Low	12,032	SqFt	81.01	No Localized M & R	0		0	$0
TA	04	Safety	48	L & T CR	Low	4,341	Ft	1.5	No Localized M & R	0		0	$0
TA	04	Safety	48	L & T CR	Medium	12,848	Ft	4.43	No Localized M & R	0		0	$0
TA	04	Safety	56	SWELLING	Low	837	SqFt	0.29	No Localized M & R	0		0	$0
TA	04	Safety	57	WEATHERING	Low	171,952	SqFt	59.33	No Localized M & R	0		0	$0
TA1	01	Safety	48	L & T CR	Medium	468	Ft	2.21	No Localized M & R	0		0	$0
TA1	01	Safety	48	L & T CR	Low	550	Ft	2.59	No Localized M & R	0		0	$0
TA1	01	Safety	52	RAVELING	Low	74	SqFt	0.35	No Localized M & R	0		0	$0
TA1	01	Safety	57	WEATHERING	Low	10,107	SqFt	47.63	No Localized M & R	0		0	$0
TA1	01	Safety	57	WEATHERING	Medium	2,601	SqFt	12.26	No Localized M & R	0		0	$0
TA2	01	Safety	48	L & T CR	Medium	777	Ft	2.85	No Localized M & R	0		0	$0
TA2	01	Safety	48	L & T CR	Low	941	Ft	3.45	No Localized M & R	0		0	$0

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TA2	01	Safety	52	RAVELING	Low	811	SqFt	2.97	No Localized M & R	0		0	$0
TA2	01	Safety	57	WEATHERING	Medium	2,073	SqFt	7.6	No Localized M & R	0		0	$0
TA2	01	Safety	57	WEATHERING	Low	20,282	SqFt	74.33	No Localized M & R	0		0	$0
TA3	01	Safety	48	L & T CR	Low	429	Ft	1.57	No Localized M & R	0		0	$0
TA3	01	Safety	48	L & T CR	Medium	1,062	Ft	3.89	No Localized M & R	0		0	$0
TA3	01	Safety	52	RAVELING	Low	601	SqFt	2.2	No Localized M & R	0		0	$0
TA3	01	Safety	57	WEATHERING	Medium	3,515	SqFt	12.88	No Localized M & R	0		0	$0
TA3	01	Safety	57	WEATHERING	Low	19,038	SqFt	69.74	No Localized M & R	0		0	$0
TA4	01	Safety	48	L & T CR	Medium	1,083	Ft	3.97	No Localized M & R	0		0	$0
TA4	01	Safety	48	L & T CR	Low	92	Ft	0.34	No Localized M & R	0		0	$0
TA4	01	Safety	57	WEATHERING	Low	14,992	SqFt	54.95	No Localized M & R	0		0	$0
TA4	01	Safety	57	WEATHERING	Medium	2,999	SqFt	10.99	No Localized M & R	0		0	$0
TA5	01	Safety	48	L & T CR	Medium	643	Ft	5	No Localized M & R	0		0	$0
TA5	01	Safety	48	L & T CR	Low	334	Ft	2.6	No Localized M & R	0		0	$0
TA5	01	Safety	57	WEATHERING	Medium	771	SqFt	6	No Localized M & R	0		0	$0
TA5	01	Safety	57	WEATHERING	Low	7,713	SqFt	60	No Localized M & R	0		0	$0
TC	01	Preventive	45	DEPRESSION	Low	77	SqFt	0.27	Patching - AC Full-Depth	116	SqFt	25.05	$2,902
TC	01	Preventive	48	L & T CR	Low	900	Ft	3.11	No Localized M & R	0		0	$0
TC	01	Preventive	52	RAVELING	Low	7,164	SqFt	24.78	No Localized M & R	0		0	$0
TC	01	Preventive	57	WEATHERING	Medium	5,076	SqFt	17.56	No Localized M & R	0		0	$0
TC	01	Preventive	57	WEATHERING	Low	7,662	SqFt	26.51	No Localized M & R	0		0	$0
TC	02	Preventive	52	RAVELING	Low	12	SqFt	0.03	No Localized M & R	0		0	$0
TC	02	Preventive	57	WEATHERING	Medium	82	SqFt	0.21	No Localized M & R	0		0	$0
TC01	01	Preventive	57	WEATHERING	Medium	1,350	SqFt	15.96	No Localized M & R	0		0	$0
TC02	01	Preventive	48	L & T CR	Low	121	Ft	1.5	No Localized M & R	0		0	$0
TC02	01	Preventive	48	L & T CR	Medium	115	Ft	1.43	Crack Sealing - AC	115	Ft	3.95	$454
TC02	01	Preventive	57	WEATHERING	Low	4,000	SqFt	49.73	No Localized M & R	0		0	$0
TC02	01	Preventive	57	WEATHERING	Medium	1,100	SqFt	13.68	No Localized M & R	0		0	$0
TC1	01	Preventive	48	L & T CR	Low	30	Ft	0.43	No Localized M & R	0		0	$0

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TC1	01	Preventive	57	WEATHERING	Low	2,700	SqFt	38.41	No Localized M & R	0		0	$0
TC1	01	Preventive	57	WEATHERING	Medium	800	SqFt	11.38	No Localized M & R	0		0	$0
TC1	02	Preventive	48	L & T CR	Low	30	Ft	0.46	No Localized M & R	0		0	$0
TC1	02	Preventive	57	WEATHERING	Medium	750	SqFt	11.45	No Localized M & R	0		0	$0
TC2	01	Preventive	48	L & T CR	Low	44	Ft	0.43	No Localized M & R	0		0	$0
TC2	01	Preventive	57	WEATHERING	Low	5,000	SqFt	48.56	No Localized M & R	0		0	$0
TC2	01	Preventive	57	WEATHERING	Medium	700	SqFt	6.8	No Localized M & R	0		0	$0
TE	01	Preventive	48	L & T CR	Low	1,590	Ft	2.12	No Localized M & R	0		0	$0
TE	01	Preventive	48	L & T CR	Medium	186	Ft	0.25	Crack Sealing - AC	186	Ft	3.95	$734
TE	01	Preventive	57	WEATHERING	Low	10,238	SqFt	13.62	No Localized M & R	0		0	$0
TE	01	Preventive	57	WEATHERING	Medium	808	SqFt	1.08	No Localized M & R	0		0	$0
TE1	01	Preventive	48	L & T CR	Low	30	Ft	0.34	No Localized M & R	0		0	$0
TE1	01	Preventive	57	WEATHERING	Medium	300	SqFt	3.38	No Localized M & R	0		0	$0
TE1	01	Preventive	57	WEATHERING	Low	4,500	SqFt	50.75	No Localized M & R	0		0	$0
TF	01	Preventive	48	L & T CR	Medium	82	Ft	0.17	Crack Sealing - AC	82	Ft	3.95	$323
TF	01	Preventive	48	L & T CR	Low	553	Ft	1.13	No Localized M & R	0		0	$0
TF	01	Preventive	57	WEATHERING	Medium	2,100	SqFt	4.29	No Localized M & R	0		0	$0
TF	01	Preventive	57	WEATHERING	Low	17,503	SqFt	35.71	No Localized M & R	0		0	$0
TF	02	Preventive	48	L & T CR	Low	30	Ft	0.25	No Localized M & R	0		0	$0
TF	02	Preventive	57	WEATHERING	Medium	800	SqFt	6.63	No Localized M & R	0		0	$0
TF	02	Preventive	57	WEATHERING	Low	6,100	SqFt	50.56	No Localized M & R	0		0	$0
THANG01	01	Preventive	41	ALLIGATOR CR	Low	98	SqFt	0.09	No Localized M & R	0		0	$0
THANG01	01	Preventive	45	DEPRESSION	Medium	98	SqFt	0.09	Patching - AC Full-Depth	142	SqFt	25.05	$3,559
THANG01	01	Preventive	45	DEPRESSION	Low	827	SqFt	0.72	Patching - AC Full-Depth	946	SqFt	25.05	$23,705
THANG01	01	Preventive	48	L & T CR	Low	1,368	Ft	1.2	No Localized M & R	0		0	$0
THANG01	01	Preventive	48	L & T CR	Medium	180	Ft	0.16	Crack Sealing - AC	180	Ft	3.95	$711
THANG01	01	Preventive	52	RAVELING	Medium	49	SqFt	0.04	No Localized M & R	0		0	$0
THANG01	01	Preventive	52	RAVELING	Low	5,483	SqFt	4.8	No Localized M & R	0		0	$0
THANG01	01	Preventive	57	WEATHERING	Medium	14,977	SqFt	13.11	No Localized M & R	0		0	$0

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THANG01	01	Preventive	57	WEATHERING	Low	62,198	SqFt	54.45	No Localized M & R	0		0	$0
THANG02	01	Preventive	48	L & T CR	Low	895	Ft	0.56	No Localized M & R	0		0	$0
THANG02	01	Preventive	48	L & T CR	Medium	124	Ft	0.08	Crack Sealing - AC	124	Ft	3.95	$491
THANG02	01	Preventive	57	WEATHERING	Low	14,412	SqFt	8.96	No Localized M & R	0		0	$0
THANG02	01	Preventive	57	WEATHERING	Medium	2,858	SqFt	1.78	No Localized M & R	0		0	$0
THANG02	02	Preventive	48	L & T CR	Medium	207	Ft	0.24	Crack Sealing - AC	207	Ft	3.95	$817
THANG02	02	Preventive	48	L & T CR	Low	380	Ft	0.44	No Localized M & R	0		0	$0
THANG02	02	Preventive	57	WEATHERING	Medium	2,476	SqFt	2.84	No Localized M & R	0		0	$0
THANG02	02	Preventive	57	WEATHERING	Low	9,375	SqFt	10.75	No Localized M & R	0		0	$0