Alabama Statewide Airport Pavement Management Program Update

South Alabama Regional Airport at Bill Benton Field (79J)

Final Report

February 2022

Submitted to

Alabama Aeronautics Bureau

Submitted by

JVIATION

All About Pavements, Inc (API)
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Pavement Management – Evaluation – Testing - Design

ALABAMA STATEWIDE AIRPORT PAVEMENT MANAGEMENT PROGRAM UPDATE

South Alabama Regional Airport at Bill Benton Field, Andalusia (79J)

FINAl REPORT

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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 South Alabama Regional Airport (79J).

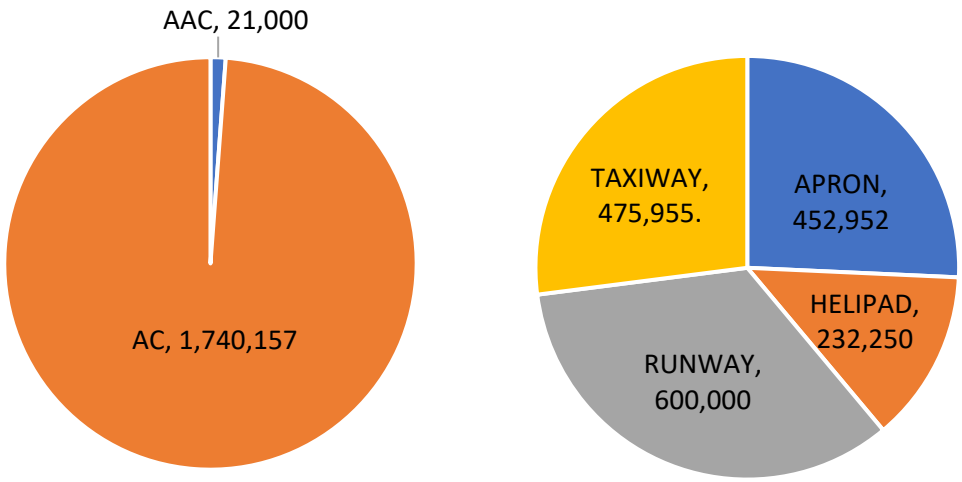
The following APMP tasks were completed to achieve the project objectives at 79J:

- 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 13 branches and 24 sections within 79J's pavement network with a total surface area of approximately 1.76 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 79J pavement network is 59, representing a "Fair" condition. The network area-weighted pavement age (AW Age) is greater than 20 years.

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

Table ES-1: 79J Section PCI Values and Ratings.

Branch ID	Name	Section ID	Surface	Area, sf	PCI	PCI Category
A01	Apron 01	01	AC	104,102	55	Poor
A01	Apron 01	02	AC	173,391	80	Satisfactory
A01	Apron 01	03	AC	6,642	10	Failed
A01	Apron 01	04	AC	7,931	27	Very Poor
A01	Apron 01	05	AC	18,106	18	Serious
A02	Apron 02	01	AC	117,693	88	Good
A03	Apron 03	01	AC	25,087	70	Fair
AHELO	Helipad	01	AC	191,500	58	Fair
AHELO	Helipad	02	AC	40,750	11	Serious
R1129	Runway 11-29	01	AC	487,000	54	Poor
R1129	Runway 11-29	02	AAC	21,000	99	Good
R1129	Runway 11-29	03	AC	92,000	68	Fair
TA	Taxiway A	01	AC	185,489	49	Poor
TA	Taxiway A	02	AC	55,061	78	Satisfactory
TA1	Taxiway A1	01	AC	21,365	50	Poor
TA1	Taxiway A1	02	AC	10,751	68	Fair
TA2	Taxiway A2	01	AC	16,671	43	Poor
TA2	Taxiway A2	02	AC	6,171	40	Very Poor
TA3	Taxiway A3	01	AC	7,657	99	Good
TA3	Taxiway A3	02	AC	10,684	50	Poor
TB	Taxiway B	01	AC	41,226	49	Poor
TC01	Taxiway Connector 01	01	AC	7,691	63	Fair
THANG01	Taxiway Hangar 01	01	AC	68,479	70	Fair
TL01	Taxilane 01	01	AC	44,710	19	Serious

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 79J network PCI values for each funding level.

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 $11.3 million. These recommendations are based on a network-level evaluation. Project-level evaluations should be conducted prior to developing design and bid package documents.

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 $132,522 as summarized in Table ES-3.

Figure ES-2: M&R Funding Levels.

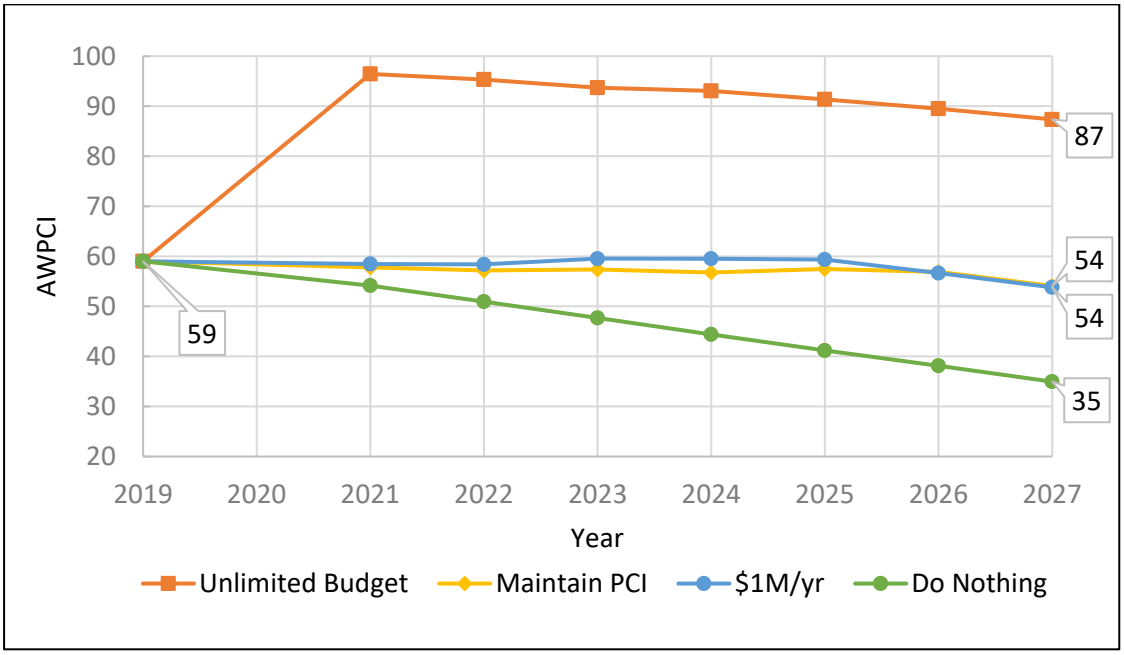


Table ES-2: Summary of Pavement Capital Improvement Program.

Project Year	CIP Project	Total Project Cost	Total Project Area, sf	AWPCI Before	AWPCI After
2021	79J_21-01_Runway 11-29 Rehabilitation	$3,666,815	720,980	51	99
	79J_21-02_Apron 02 Preservation	$103,167	117,693	85	91
2022	79J_22-01_Taxiway A Reconstruction	$2,119,652	202,344	41	100
2023	79J_23-01_Apron 01 Rehabilitation	$610,453	104,102	47	100
	79J_23-02_Helo Apron Rehabilitation	$1,562,636	232,250	42	100
2024	79J_24-01_Apron 03 Rehabilitation	$185,462	35,838	56	100
	79J_24-02_Taxiway Hangar 01 Rehabilitation	$413,607	68,479	50	100

Project Year	CIP Project	Total Project Cost	Total Project Area, sf	AWPCI Before	AWPCI After
	79J_24-03_Runway 11-29 Surface Treatment	$432,304	679,262	96	99
2025	79J_25-01_Taxiway A Surface Treatment	$132,641	202,344	96	99
2026	79J_26-01_Apron 01 Surface Treatment	$70,289	104,102	93	98
	79J_26-02_Helo Apron Surface Treatment	$156,813	232,250	93	98
2027	79J_27-01_Apron 01 Rehabilitation	$910,277	173,391	70	100
	79J_27-02_Apron 01 Reconstruction	$939,809	77,389	1	100
	79J_27-03_Apron 03 Surface Treatment	$24,923	35,838	94	98
	Total	**$11,328,848**			

Table ES-3: Summary of Localized Maintenance Plan.

Policy	Work Description	Work Quantity	Work Unit	Work Cost
Preventive	Crack Sealing - AC	2,462	Ft	$9,724
	Patching - AC Full-Depth	2,199	SqFt	$55,079
Safety	Crack Sealing - AC	9,077	Ft	$35,856
	Patching - AC Full-Depth	1,272	SqFt	$31,863
			Total	**$132,522**

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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 South Alabama Regional Airport (79J), 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 79J report will be one of the 59 individual airport reports that will be available on ALDOT's website.

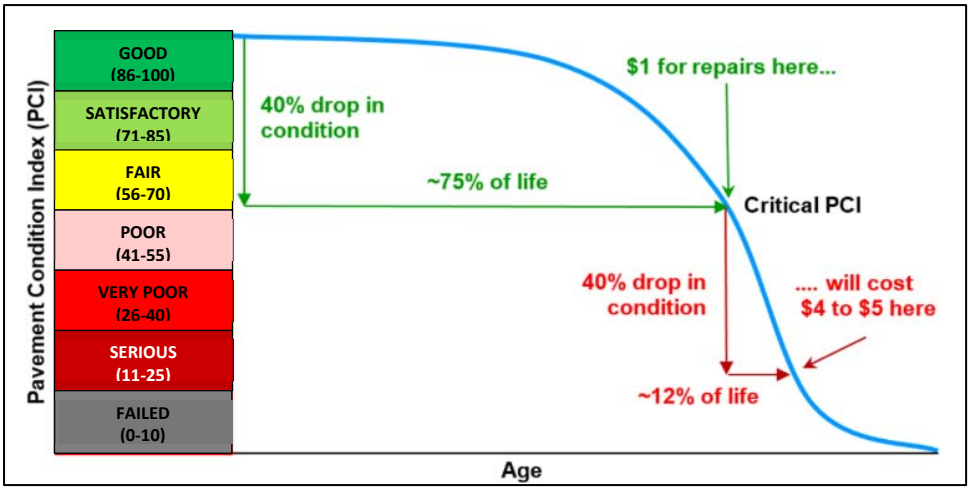
1.3. Pavement Management Concept

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

79J is a General Aviation (GA) airport located approximately 4 miles east of Andalusia. The airport was activated in April 1940 and is owned and operated by the Andalusia Airport Authority. Figure 2.1 shows an aerial image of the airport.

Figure 2.1: South Alabama Regional Airport.

(Source: Google Earth)

2.2. Pavement Inventory

79J consists of one runway, a parallel taxiway, three connector taxiways, a helipad, and multiple aprons. The total pavement area is approximately 1.76 million square feet. Pavement surfaces at 79J include Asphalt Concrete (AC) and Asphalt Overlay on AC (AAC). A complete listing of the pavement sections is included in Appendix A. Runway 11-29 is 6,000 ft. long and 100 ft. wide.

A records search was undertaken to identify any preservation or rehabilitation work that has occurred at 79J since the last APMP update in 2009. The records for the repair of Runway 11-29 at the Taxiway A3 intersection in 2018 that were provided by ALDOT were reviewed, and the PAVER database was updated with work history information.

2.3. Climatic Conditions

Table 3.1 provides a summary of the climatic data for the geographic region that includes 79J. As the table shows, the pavements at 79J are not exposed to any freeze-thaw cycles. The mean air temperature for January ranges from an average low of 36 degrees °F to an average high of 61 degrees °F. The average annual rainfall at 79J is near 62 inches.

Table 2.1: Average Annual Temperatures and Rainfall for 79J.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
High Temp (°F)	61	65	73	79	86	91	93	92	89	81	72	64
Low Temp (°F)	36	38	44	50	58	66	70	69	65	51	43	38
Precip. (in)	5.9	5.4	7.2	4.5	4.9	5.2	6.5	4.9	4.8	3.1	4.7	4.7

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 79J 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 79J.

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 79J.

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 13 branches (facilities) at 79J that include 24 pavement sections and a total area of approximately 1.8 million square feet of paved surfaces, as shown in Table 2.3.

Table 2.3: 79J Pavement Branches.

Branch ID	Branch Name	Branch Use	Area, sf	Number of Sections
A01	Apron 01	APRON	310,172	5
A02	Apron 02	APRON	117,693	1
A03	Apron 03	APRON	25,087	1
AHELO	Helipad	HELIPAD	232,250	2
R1129	Runway 11-29	RUNWAY	600,000	3
TA	Taxiway A	TAXIWAY	240,550	2
TA1	Taxiway A1	TAXIWAY	32,116	2
TA2	Taxiway A2	TAXIWAY	22,842	2
TA3	Taxiway A3	TAXIWAY	18,341	2
TB	Taxiway B	TAXIWAY	41,226	1
TC01	Taxiway Connector 01	TAXIWAY	7,691	1
THANG01	Taxiway Hangar 01	TAXIWAY	68,479	1
TL01	Taxilane 01	TAXIWAY	44,710	1
		Total	**1,761,157**	**24**

Table 2.4 shows the distribution of airfield pavement by age with the area-weighted age being greater than 20 years for all airside pavements at 79J.

Table 2.4: 79J Pavement Age.

Age (Years)	Number of Sections	Percent of Area	Area, sf
0 – 5	1	1	21,000
6 – 10	2	2	35,838
11 – 15	6	49	861,459
16 – 20	9	23	396,271
> 20	6	25	446,589

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: 79J Pavement Area by Surface Type.

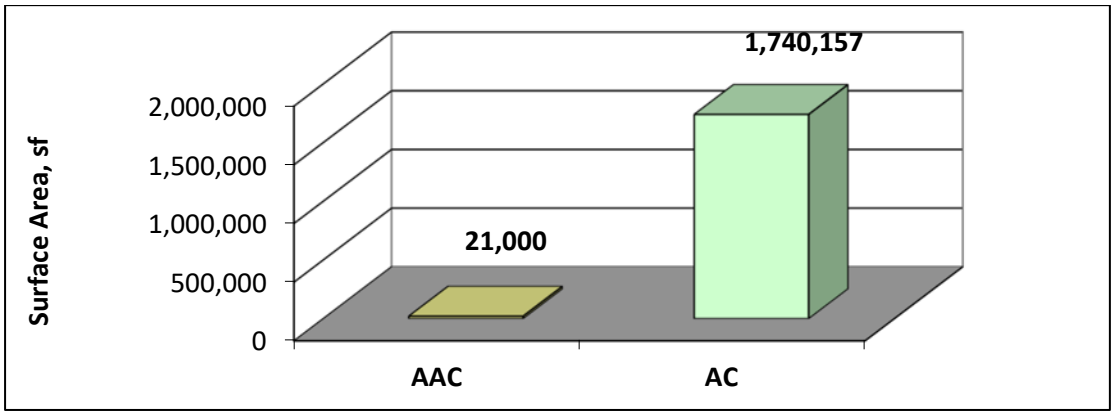
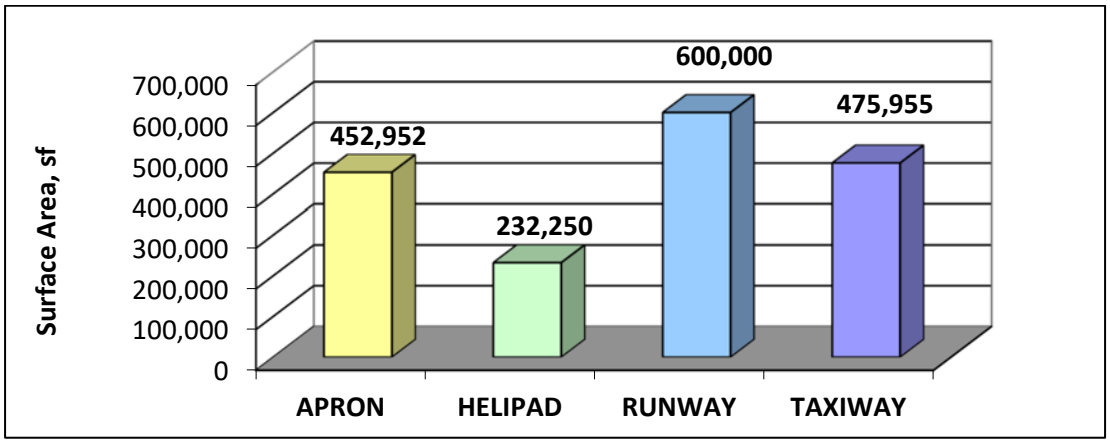


Figure 2.3: 79J Pavement Area by Branch Use.



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

3 Pavement Condition

3.1. Introduction

A visual PCI survey of the airside pavements at 79J 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.

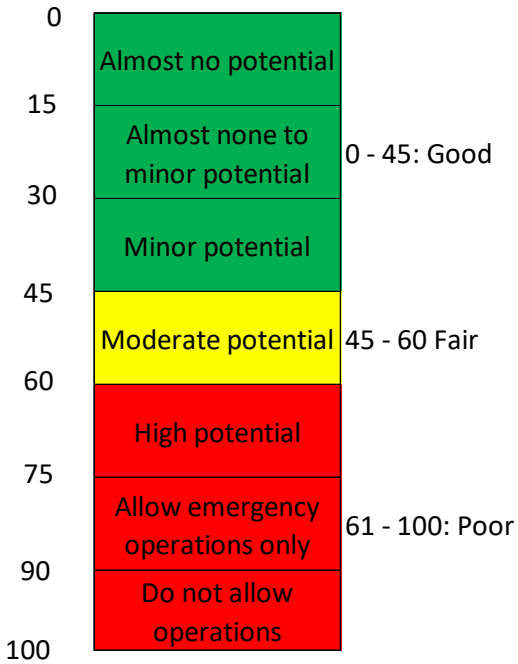
Distress descriptions provided in Appendix C were taken from the "PCI Field Manual," developed by the U.S. Army Construction Engineering Research Lab (CERL), latest edition. Appendix C provides a detailed explanation of each type of AC and PCC surface distress.

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 79J include 24 sections with 367 sample units. The sample number of sample units that were surveyed in the field is 99, which is 27 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.

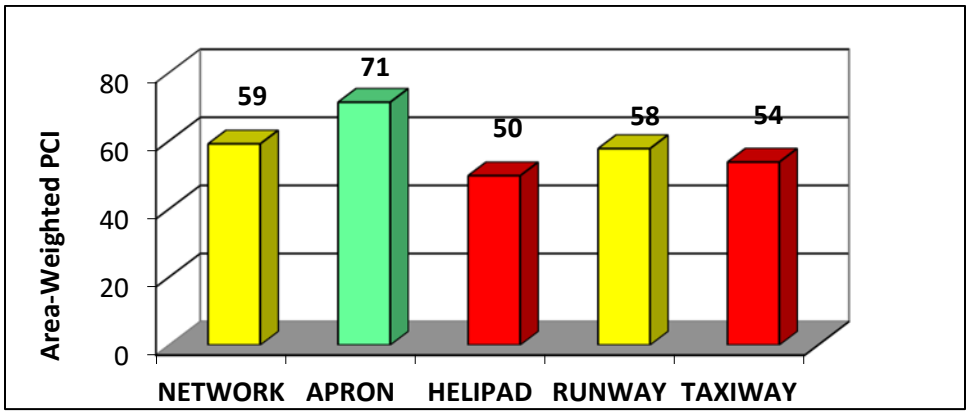


Figure 3.3 shows the distribution of the 79J pavement network by condition. Approximately 56 percent of the network is in "Poor" or worse condition.

Figure 3.3: Pavement Condition by Percent of Area.

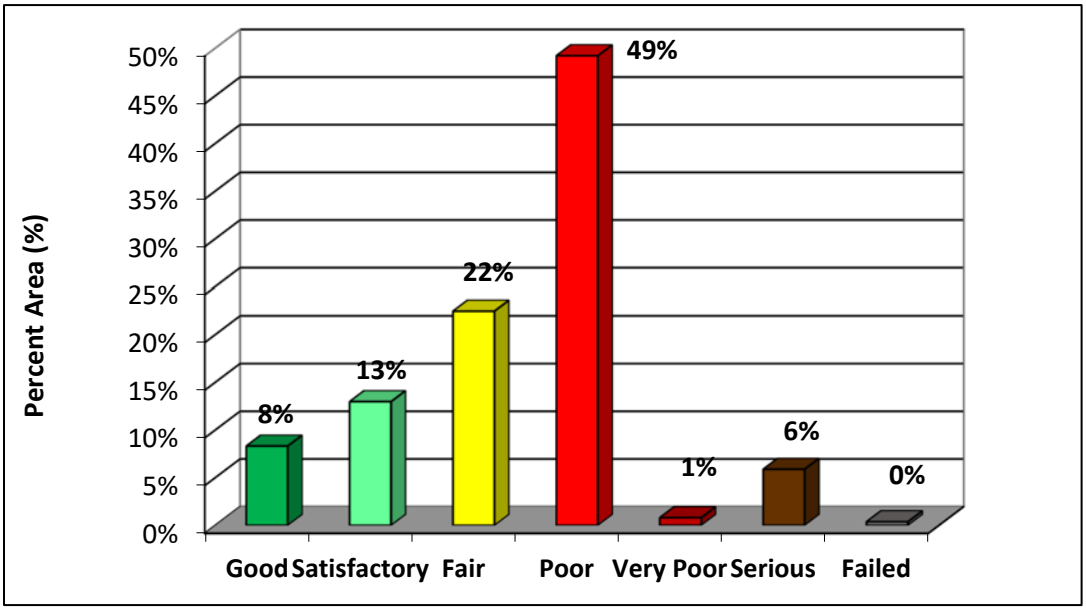


Table 3.2 is a listing of the section PCI.

Table 3.2: Section PCI.

Branch ID	Name	Section ID	Surface	Area, sf	PCI	PCI Category	FOD
A01	Apron 01	01	AC	104,102	55	Poor	58
A01	Apron 01	02	AC	173,391	80	Satisfactory	32
A01	Apron 01	03	AC	6,642	10	Failed	94
A01	Apron 01	04	AC	7,931	27	Very Poor	84
A01	Apron 01	05	AC	18,106	18	Serious	90
A02	Apron 02	01	AC	117,693	88	Good	21
A03	Apron 03	01	AC	25,087	70	Fair	43
AHELO	Helipad	01	AC	191,500	58	Fair	57
AHELO	Helipad	02	AC	40,750	11	Serious	93
R1129	Runway 11-29	01	AC	487,000	54	Poor	58
R1129	Runway 11-29	02	AAC	21,000	99	Good	10
R1129	Runway 11-29	03	AC	92,000	68	Fair	46
TA	Taxiway A	01	AC	185,489	49	Poor	66
TA	Taxiway A	02	AC	55,061	78	Satisfactory	34
TA1	Taxiway A1	01	AC	21,365	50	Poor	60
TA1	Taxiway A1	02	AC	10,751	68	Fair	46
TA2	Taxiway A2	01	AC	16,671	43	Poor	70
TA2	Taxiway A2	02	AC	6,171	40	Very Poor	64
TA3	Taxiway A3	01	AC	7,657	99	Good	10
TA3	Taxiway A3	02	AC	10,684	50	Poor	65
TB	Taxiway B	01	AC	41,226	49	Poor	61
TC01	Taxiway Connector 01	01	AC	7,691	63	Fair	51
THANG01	Taxiway Hangar 01	01	AC	68,479	70	Fair	39
TL01	Taxilane 01	01	AC	44,710	19	Serious	85

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 79J.

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.

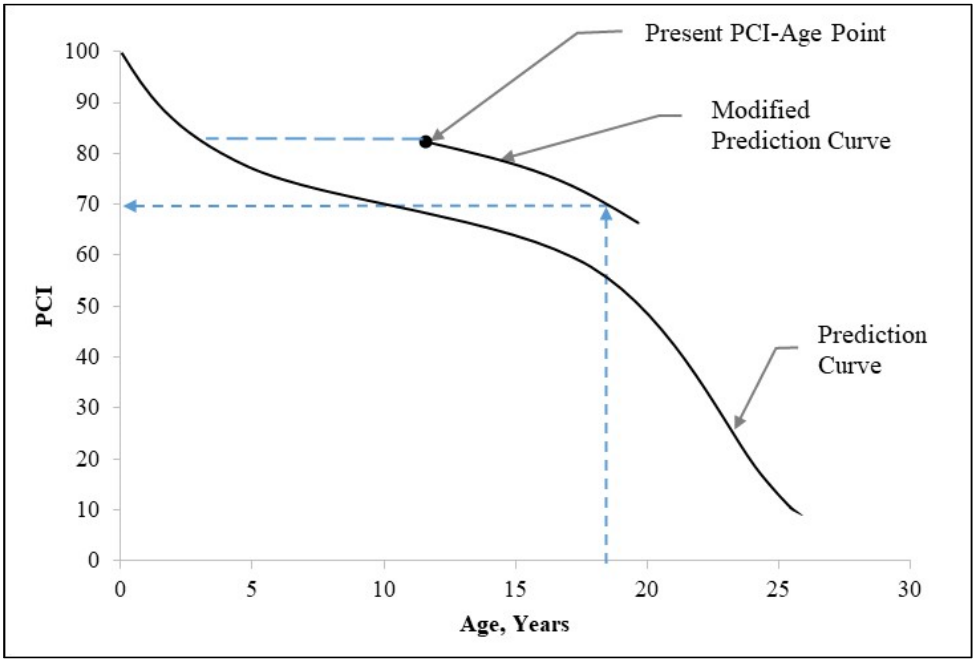
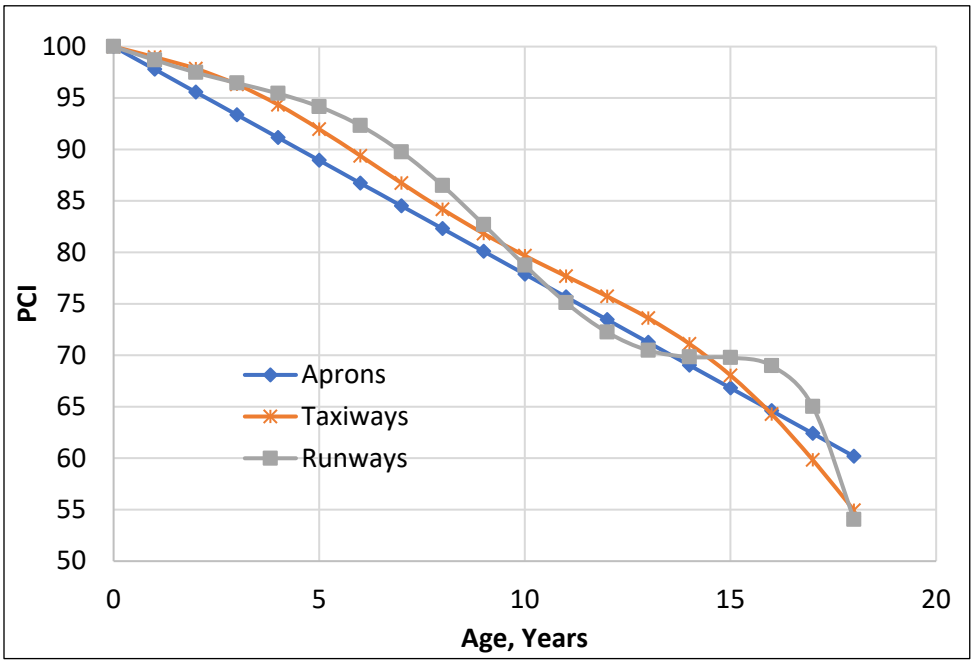


Figure 4.2: Family Curves.



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 79J 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 59.
- Constrained Funding: This scenario constrains the funding to $1 million each year (total of $7 million). The PCI decreases to 54 in 2027.
- Do Nothing: Performing no M&R would reduce the network PCI from 59 to 35 by 2027.

Figure 4.3: Budget Analysis Process.

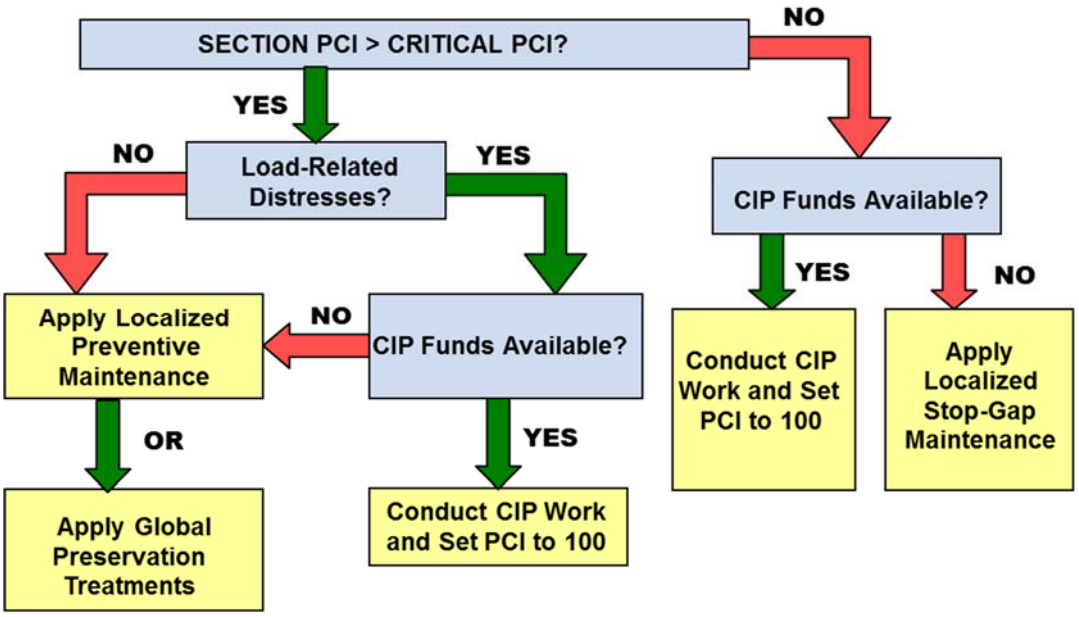


Figure 4.4: M&R Funding Levels.

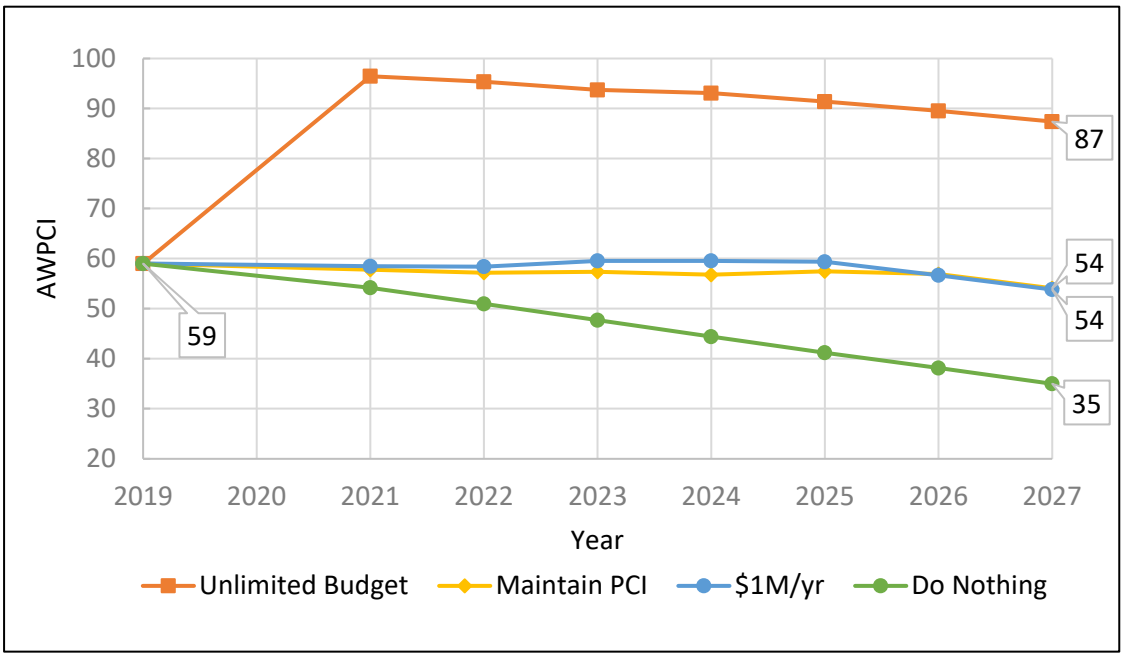


Table 4.2 summarizes the annual funding required for the above analyses. For the unlimited analysis, all pavement needs are funded in the year they are required. Therefore, the unfunded costs are zero. The total funded amount over the 7-year period is approximately $9.5 million. For the annual funding 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 $11.3 million.

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

Year	Unlimited	Maintain PCI	Constrained $1M/year	Do Nothing
2021	$9,024,000	$867,000	$999,000	$0
2022	$119,000	$876,000	$988,000	$0
2023	$12,000	$863,000	$971,000	$0
2024	$270,000	$846,000	$941,000	$0
2025	$25,000	$881,000	$678,000	$0
2026	$36,000	$825,000	$213,000	$0
2027	$27,000	$223,000	$224,000	$0
Total	**$9,512,000**	**$5,380,000**	**$5,014,000**	**$0**
2027 Backlog	**-**	**$11,272,000**	**$11,272,000**	**$18,047,000**

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 $11.3 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 79J.

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	79J_21-01_Runway 11-29 Rehabilitation	$3,666,815	720,980	51	99
	79J_21-02_Apron 02 Preservation	$103,167	117,693	85	91
2022	79J_22-01_Taxiway A Reconstruction	$2,119,652	210,035	42	100
2023	79J_23-01_Apron 01 Rehabilitation	$610,453	104,102	47	100
	79J_23-02_Helo Apron Rehabilitation	$1,562,636	232,250	42	100
2024	79J_24-01_Apron 03 Rehabilitation	$185,462	35,838	56	100
	79J_24-02_Taxiway Hangar 01 Rehabilitation	$413,607	68,479	50	100
	79J_24-03_Runway 11-29 Surface Treatment	$432,304	679,262	96	99
2025	79J_25-01_Taxiway A Surface Treatment	$132,641	202,344	96	99
2026	79J_26-01_Apron 01 Surface Treatment	$70,289	104,102	93	98
	79J_26-02_Helo Apron Surface Treatment	$156,813	232,250	93	98
2027	79J_27-01_Apron 01 Rehabilitation	$910,277	173,391	70	100
	79J_27-02_Apron 01 Reconstruction	$939,809	77,389	1	100
	79J_27-03_Apron 03 Surface Treatment	$24,923	35,838	94	98
	Total	**$11,328,848**			

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

Branch	Section	Area, sf	PCI Before Rehab	Activity	Activity Type	Cost
79J_21-01_Runway 11-29 Rehabilitation						**$3,666,815**
R1129	01	487,000	49	Mill 2" & 2" AC OLP	Rehabilitation	$2,691,830
R1129	03	92,000	60	Mill 2" & 2" AC OL	Rehabilitation	$404,493
TA	02	55,061	76	Taxiway & Apron Surface Treatment	Preservation	$48,265
TA1	01	21,365	46	Mill 2" & 2" AC OLP	Rehabilitation	$118,092
TA2	01	16,671	39	AC Reconstruction	Reconstruction	$169,550
TA3	01	7,657	98	Taxiway & Apron Surface Treatment	Preservation	$6,712
TB	01	41,226	45	Mill 2" & 2" AC OLP	Rehabilitation	$227,871
79J_21-02_Apron 02 Preservation						**$103,167**
A02	01	117,693	85	Taxiway & Apron Surface Treatment	Preservation	$103,167
79J_22-01_Taxiway A Reconstruction						**$2,119,652**
TA	01	185,489	43	AC Reconstruction	Reconstruction	$1,943,088
TA2	02	6,171	32	AC Reconstruction	Reconstruction	$64,644
TA3	02	10,684	44	AC Reconstruction	Reconstruction	$111,920

Branch	Section	Area, sf	PCI Before Rehab	Activity	Activity Type	Cost
TC01	01	7,691	58	Mill 2" & 2" AC OLP	Rehabilitation	See Note
79J_23-01_Apron 01 Rehabilitation						**$610,453**
A01	01	104,102	48	Mill 2" & 2" AC OLP	Rehabilitation	$610,453
79J_23-02_Helo Apron Rehabilitation						**$1,562,636**
AHELO	01	191,500	51	Mill 2" & 2" AC OLP	Rehabilitation	$1,122,954
AHELO	02	40,750	4	AC Reconstruction	Reconstruction	$439,682
79J_24-01_Apron 03 Rehabilitation						**$185,462**
A03	01	25,087	61	Mill 2" & 2" AC OL	Rehabilitation	$120,527
TA1	02	10,751	49	Mill 2" & 2" AC OLP	Rehabilitation	$64,935
79J_24-02_Taxiway Hangar 01 Rehabilitation						**$413,607**
THANG01	01	68,479	52	Mill 2" & 2" AC OLP	Rehabilitation	$413,607
79J_24-03_Runway 11-29 Surface Treatment						**$432,304**
R1129	01	487,000	-	Surface Treatment	Preservation	$309,942
R1129	02	21,000	-	Surface Treatment	Preservation	$13,365
R1129	03	92,000	-	Surface Treatment	Preservation	$58,552
TA1	01	21,365	-	Surface Treatment	Preservation	$13,597
TA2	01	16,671	-	Surface Treatment	Preservation	$10,610
TB	01	41,226	-	Surface Treatment	Preservation	$26,238
79J_25-01_Taxiway A Surface Treatment						**$132,641**
TA	01	185,489	-	Surface Treatment	Preservation	$121,593
TA2	02	6,171	-	Surface Treatment	Preservation	$4,045
TA3	02	10,684	-	Surface Treatment	Preservation	$7,004
79J_26-01_Apron 01 Surface Treatment						**$70,289**
A01	01	104,102	-	Surface Treatment	Preservation	$70,289
79J_26-02_Helo Apron Surface Treatment						**$156,813**
AHELO	01	191,500	-	Surface Treatment	Preservation	$129,299
AHELO	02	40,750	-	Surface Treatment	Preservation	$27,514
79J_27-01_Apron 01 Rehabilitation						**$910,277**
A01	02	173,391	64	Mill 2" & 2" AC OL	Rehabilitation	$910,277
79J_27-02_Apron 01 Reconstruction						**$939,809**
A01	03	6,642	0	AC Reconstruction	Reconstruction	$80,660
A01	04	7,931	11	AC Reconstruction	Reconstruction	$96,314
A01	05	18,106	2	AC Reconstruction	Reconstruction	$219,879
TL01	01	44,710	0	AC Reconstruction	Reconstruction	$542,956
79J_27-03_Apron 03 Surface Treatment						**$24,923**
A03	01	25,087	-	Surface Treatment	Preservation	$17,447
TA1	02	10,751	-	Surface Treatment	Preservation	$7,477
					Total	**$11,328,848**

Cost for section TC01-01 excluded from PCIP as directed by ALDOT

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 $11.3 million for 79J:

- FAA (90%): $10.1 million
- ALDOT (5%): $0.6 million
- Airport Sponsor (5%): $0.6 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 $132,522. 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 79J pavements.

Table 4.5: Summary of Year-1 Maintenance Plan.

Policy	Work Description	Work Quantity	Work Unit	Work Cost
Preventive	Crack Sealing - AC	2,462	Ft	$9,724
	Patching - AC Full-Depth	2,199	SqFt	$55,079
Safety	Crack Sealing - AC	9,077	Ft	$35,856
	Patching - AC Full-Depth	1,272	SqFt	$31,863
			Total	**$132,522**

APPENDIX A

INVENTORY

Appendix A

Pavement Inventory Report

South Alabama Regional At Bill Benton Field (79J)

Branch ID	Name	Branch Use	Section ID	Rank[1]	Length (ft)	Width (ft)	Area (sf)	LCD[2]	Surface[3]
A01	Apron 01 Andalusia	APRON	01	S	341	228	104,102	1/1/2003	AC
A01	Apron 01 Andalusia	APRON	02	S	650	221	173,391	1/1/1940	AC
A01	Apron 01 Andalusia	APRON	03	S	115	50	6,642	1/1/2004	AC
A01	Apron 01 Andalusia	APRON	04	S	100	90	7,931	1/1/2004	AC
A01	Apron 01 Andalusia	APRON	05	S	190	90	18,106	10/7/1982	AC
A02	Apron 02 Andalusia	APRON	01	S	472	249	117,693	1/1/2005	AC
A03	Apron 03 Andalusia	APRON	01	S	481	40	25,087	6/1/2011	AC
AHELO	Helipad Andalusia	HELIPAD	01	S	1,915	100	191,500	1/1/1940	AC
AHELO	Helipad Andalusia	HELIPAD	02	S	412	100	40,750	1/1/1940	AC
R1129	Runway 11-29 Andalusia	RUNWAY	01	P	4,870	100	487,000	1/1/2006	AC
R1129	Runway 11-29 Andalusia	RUNWAY	02	P	210	100	21,000	6/1/2018	AAC
R1129	Runway 11-29 Andalusia	RUNWAY	03	P	920	100	92,000	10/2/2008	AC
TA	Taxiway A Andalusia	TAXIWAY	01	P	5,250	35	185,489	1/1/2002	AC
TA	Taxiway A Andalusia	TAXIWAY	02	P	1,340	35	55,061	10/2/2008	AC
TA1	Taxiway A1 Andalusia	TAXIWAY	01	S	332	40	21,365	1/1/2002	AC
TA1	Taxiway A1 Andalusia	TAXIWAY	02	S	177	45	10,751	6/1/2011	AC
TA2	Taxiway A2 Andalusia	TAXIWAY	01	S	332	40	16,671	1/1/1940	AC
TA2	Taxiway A2 Andalusia	TAXIWAY	02	S	107	40	6,171	1/1/1940	AC
TA3	Taxiway A3 Andalusia	TAXIWAY	01	S	50	183	7,657	1/1/2002	AC
TA3	Taxiway A3 Andalusia	TAXIWAY	02	S	272	35	10,684	1/1/2002	AC
TB	Taxiway B Andalusia	TAXIWAY	01	S	650	50	41,226	1/1/2005	AC
TC01	Taxiway Connector 01 Andalusia	TAXIWAY	01	S	140	30	7,691	1/1/2002	AC
THANG01	Taxiway Hangar 01 Andalusia	TAXIWAY	01	T	500	175	68,479	8/1/2009	AC
TL01	Taxilane 01 Andalusia	TAXIWAY	01	T	790	50	44,710	1/1/2004	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

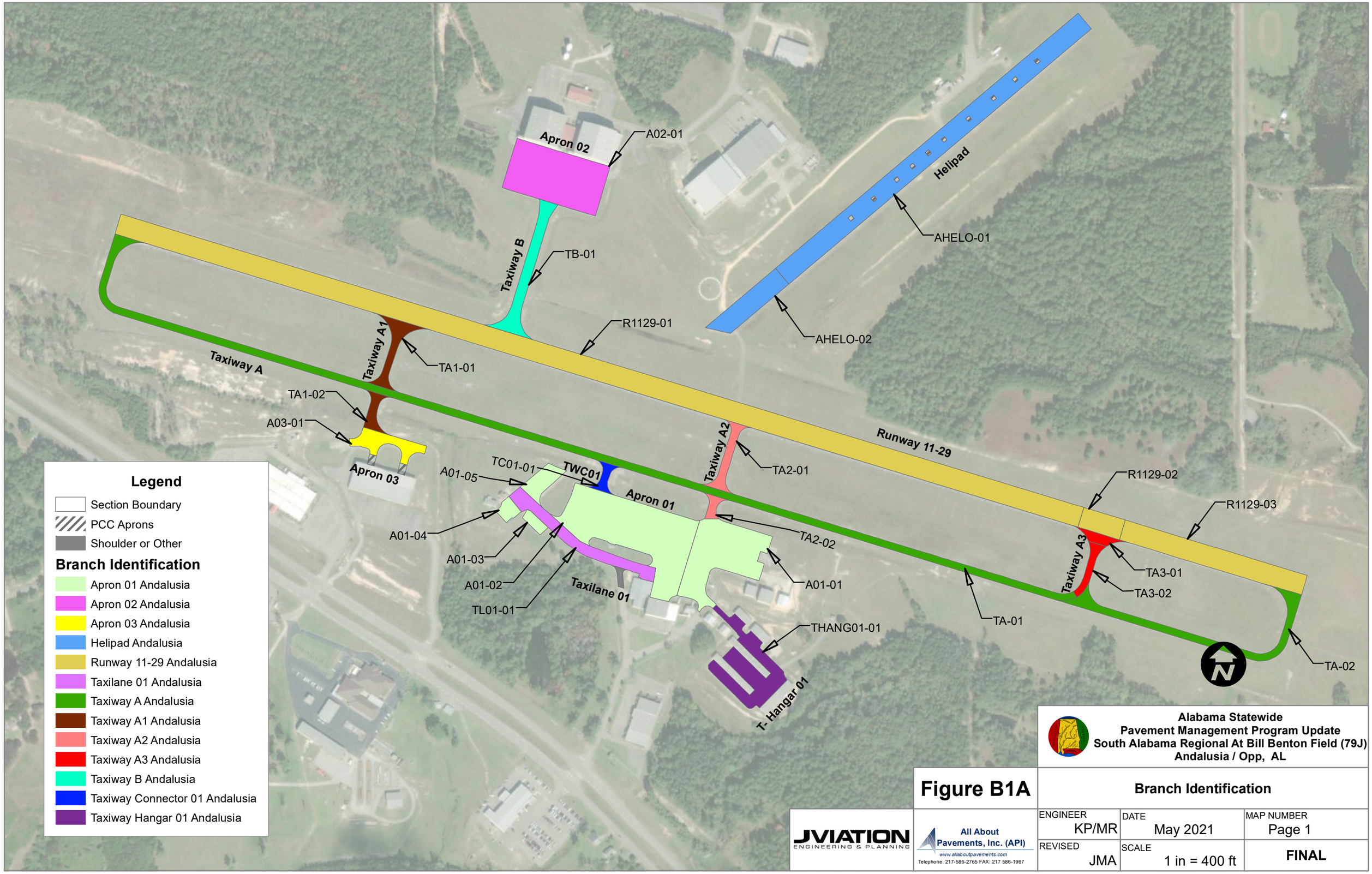
APPENDIX B

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



Alabama Statewide
Pavement Management Program Update
South Alabama Regional At Bill Benton Field (79J)
Andalusia / Opp, AL

Figure B1A

Branch Identification

JVIATION ENGINEERING & PLANNING

All About Pavements, Inc. (API)
www.allaboutpavements.com
Telephone: 217-586-2765 FAX: 217 586-1967

ENGINEER	DATE	MAP NUMBER
KP/MR	May 2021	Page 1
REVISED	SCALE	
JMA	1 in = 400 ft	FINAL

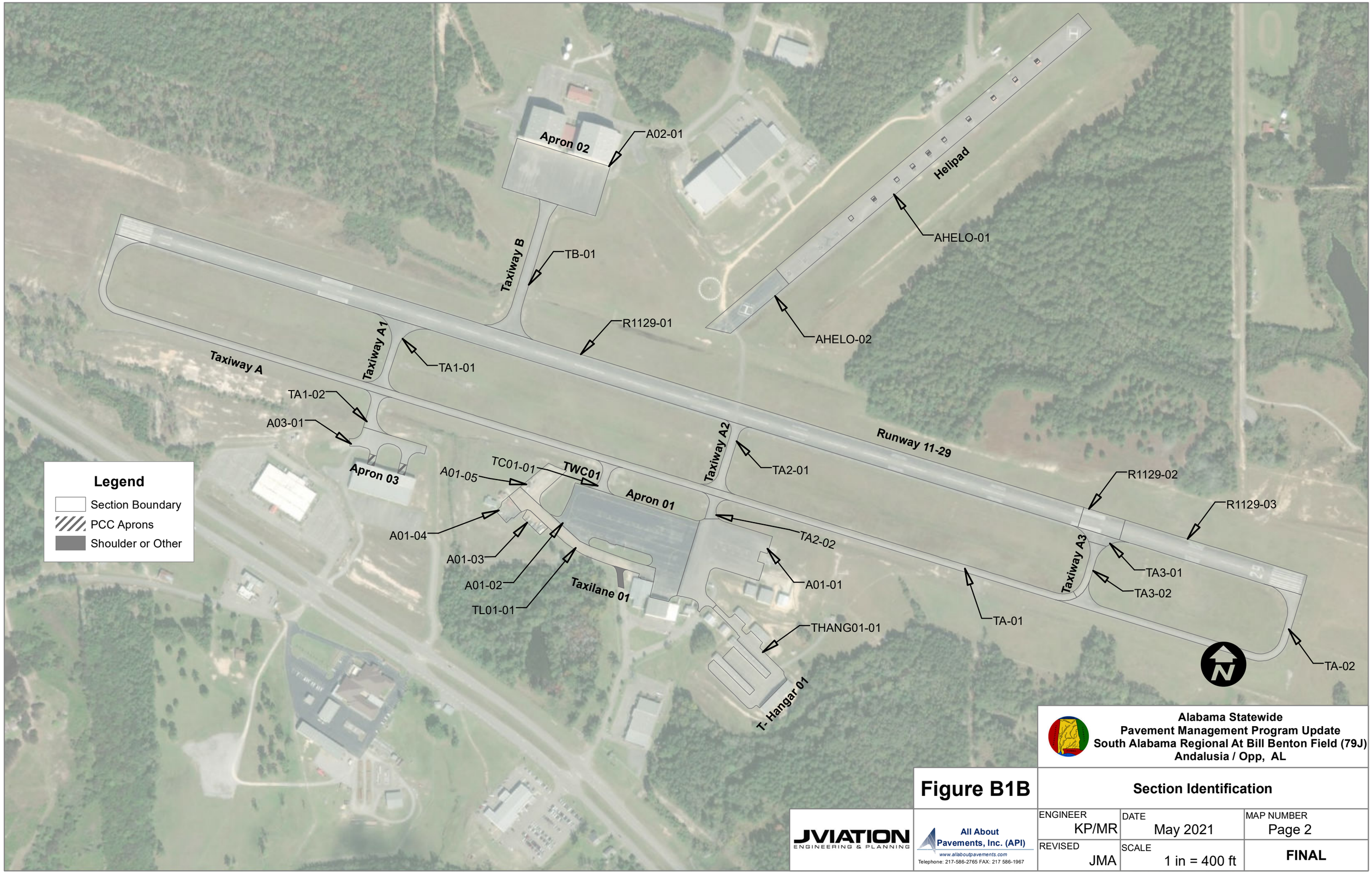


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Figure B1B

Section Identification

JVIATION ENGINEERING & PLANNING

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ENGINEER	DATE	MAP NUMBER
KP/MR	May 2021	Page 2
REVISED	SCALE	
JMA	1 in = 400 ft	**FINAL**

Apron 02
A02-01
Taxiway B
TB-01
Helipad
AHELO-01
AHELO-02
R1129-01
Taxiway A1
TA1-01
Taxiway A
TA1-02
A03-01
Apron 03
TC01-01
TWC01
A01-05
Apron 01
Taxiway A2
TA2-01
Runway 11-29
R1129-02
R1129-03
A01-04
A01-03
A01-02
TL01-01
Taxilane 01
A01-01
TA2-02
TA-01
Taxiway A3
TA3-01
TA3-02
TA-02
THANG01-01
T- Hangar 01

Legend

- Section Boundary
- PCC Aprons
- Shoulder or Other

Sample Unit Layout

- SU Boundary
- Inspected

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Figure B1C

Sample Unit Layout

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ENGINEER	DATE	MAP NUMBER
KP/MR	May 2021	Page 3
REVISED	SCALE	
JMA	1 in = 400 ft	FINAL

Apron 02
A02-01
Helipad
AHELO-01
AHELO-02
Taxiway B
TB-01
R1129-01
Taxiway A1
Taxiway A
TA1-01
TA1-02
A03-01
Apron 03
Taxiway A2
Runway 11-29
TA2-01
TC01-01
TWC01
A01-05
Apron 01
A01-04
A01-03
A01-02
TL01-01
Taxilane 01
TA2-02
A01-01
TA-01
R1129-02
R1129-03
Taxiway A3
TA3-01
TA3-02
TA-02
THANG01-01
T- Hangar 01
N

Legend

- Section Boundary
- PCC Aprons
- Shoulder or Other

Pavement Type

- Asphalt Concrete (AC)
- Asphalt Overlay Over AC (AAC)

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Pavement Management Program Update
South Alabama Regional At Bill Benton Field (79J)
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Figure B1D

Pavement Type

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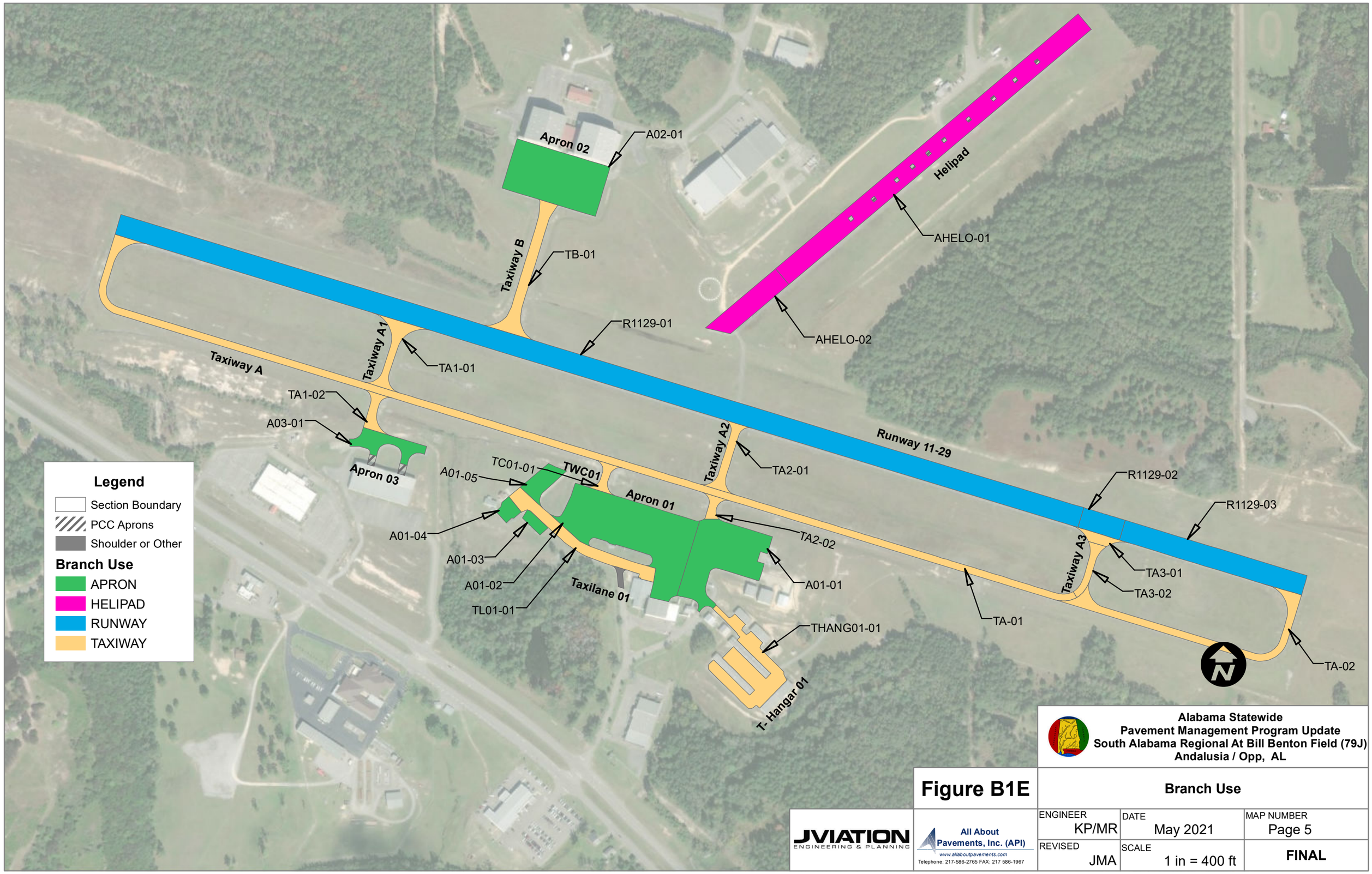
KP/MR	May 2021	Page 4
REVISED	SCALE	
JMA	1 in = 400 ft	FINAL



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South Alabama Regional At Bill Benton Field (79J)
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Figure B1E

Branch Use

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ENGINEER	DATE	MAP NUMBER
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REVISED	SCALE	
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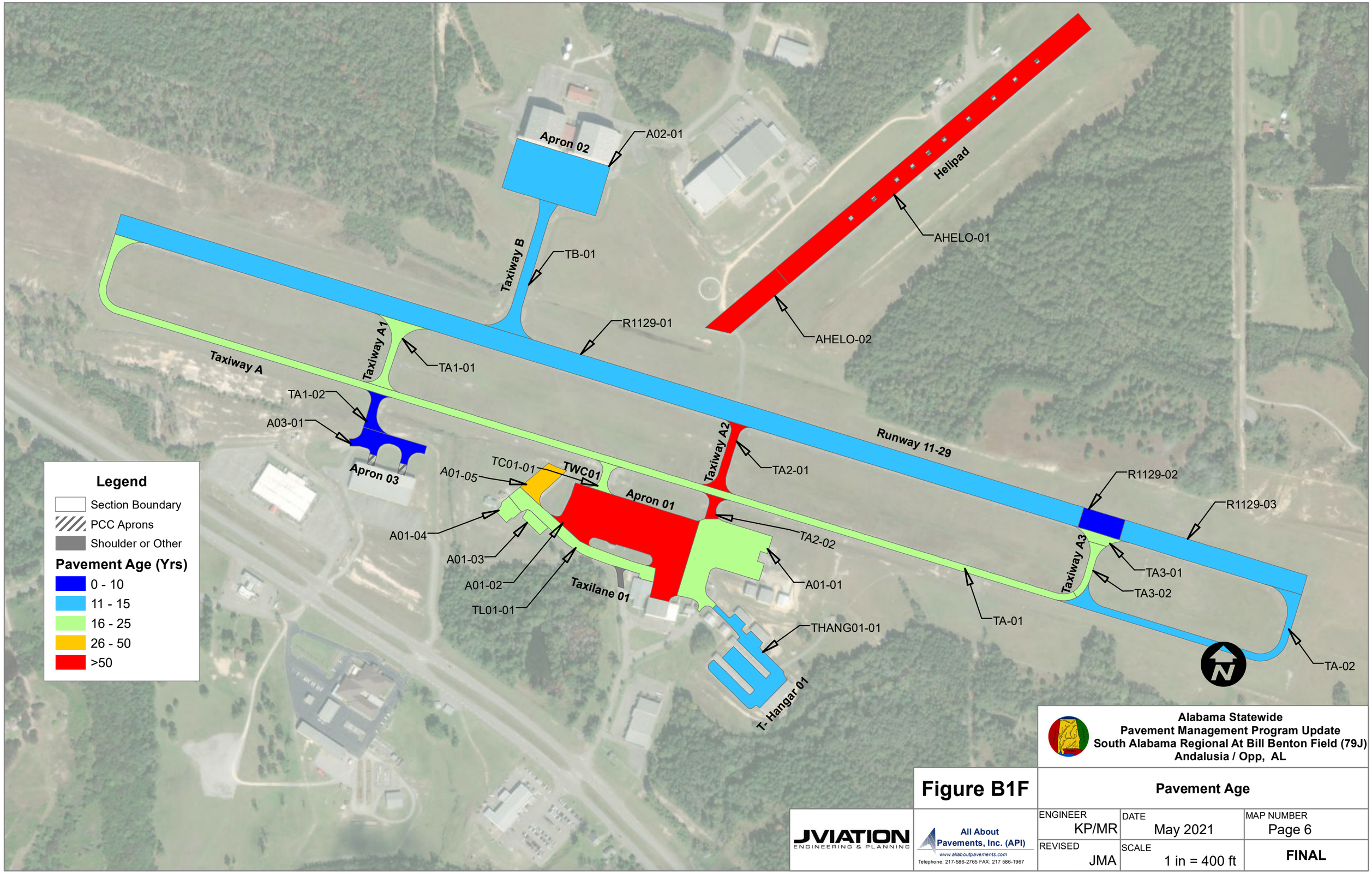

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Figure B1F

Pavement Age

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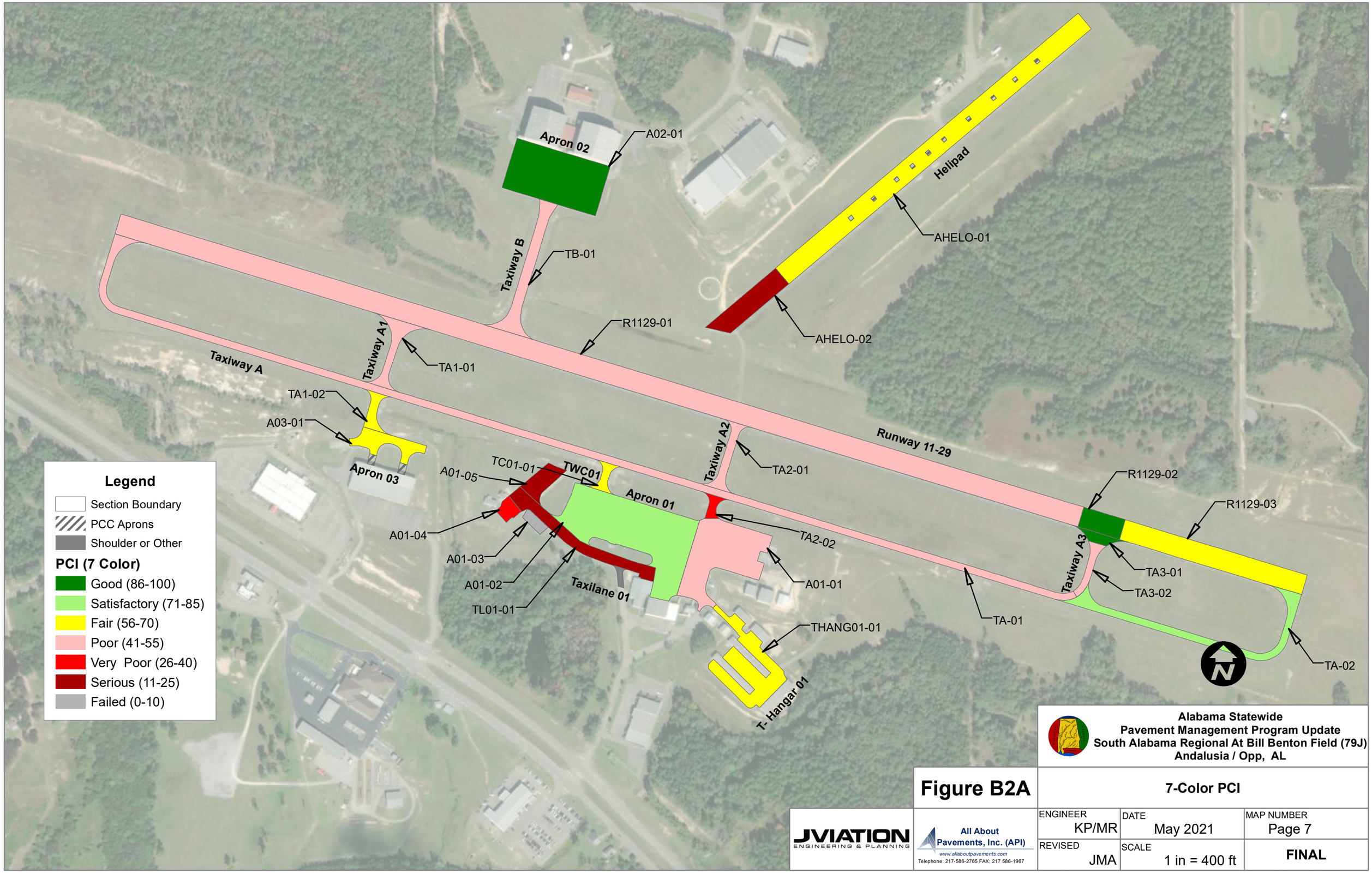
ENGINEER	DATE	MAP NUMBER
KP/MR	May 2021	Page 6
REVISED	SCALE	
JMA	1 in = 400 ft	FINAL



Alabama Statewide
Pavement Management Program Update
South Alabama Regional At Bill Benton Field (79J)
Andalusia / Opp, AL

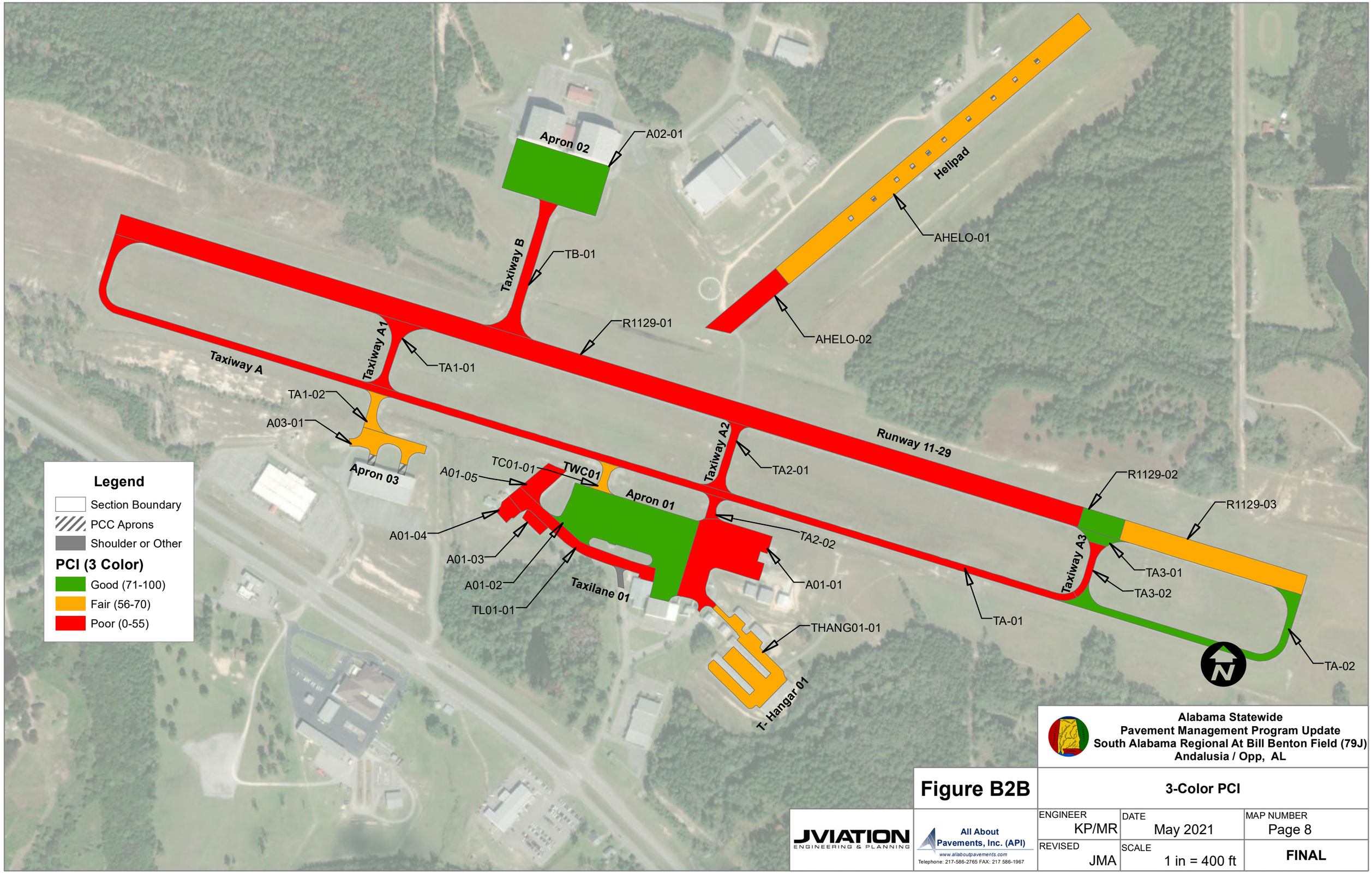
Figure B2A

7-Color PCI

JVIATION ENGINEERING & PLANNING

All About Pavements, Inc. (API)
www.allaboutpavements.com
Telephone: 217-586-2765 FAX: 217 586-1967

ENGINEER	DATE	MAP NUMBER
KP/MR	May 2021	Page 7
REVISED	SCALE	
JMA	1 in = 400 ft	**FINAL**



Alabama Statewide
Pavement Management Program Update
South Alabama Regional At Bill Benton Field (79J)
Andalusia / Opp, AL

Figure B2B

3-Color PCI

JVIATION ENGINEERING & PLANNING

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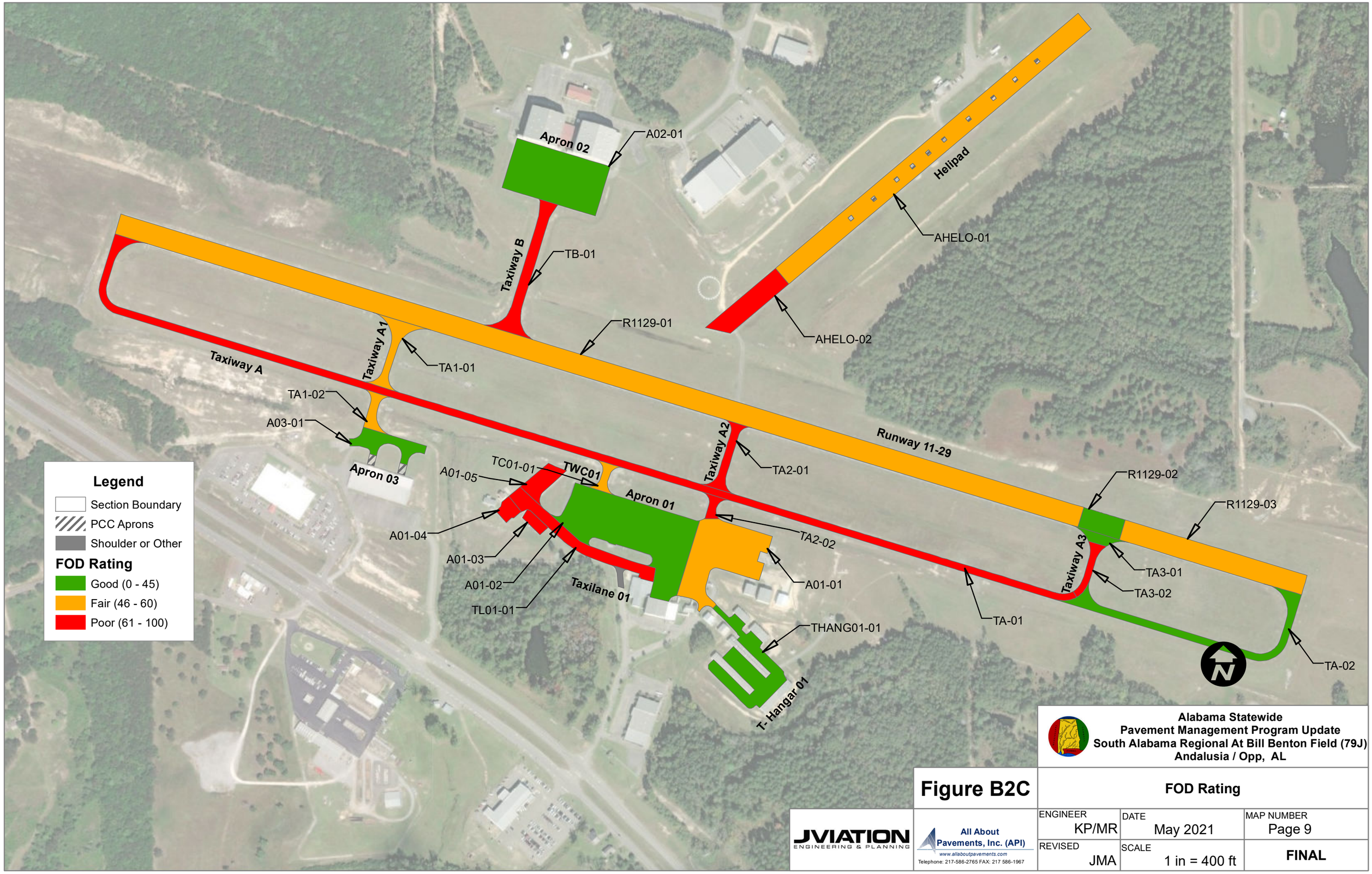
ENGINEER	DATE	MAP NUMBER
KP/MR	May 2021	Page 8
REVISED	SCALE	
JMA	1 in = 400 ft	FINAL



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Pavement Management Program Update
South Alabama Regional At Bill Benton Field (79J)
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Figure B2C

FOD Rating

JVIATION ENGINEERING & PLANNING

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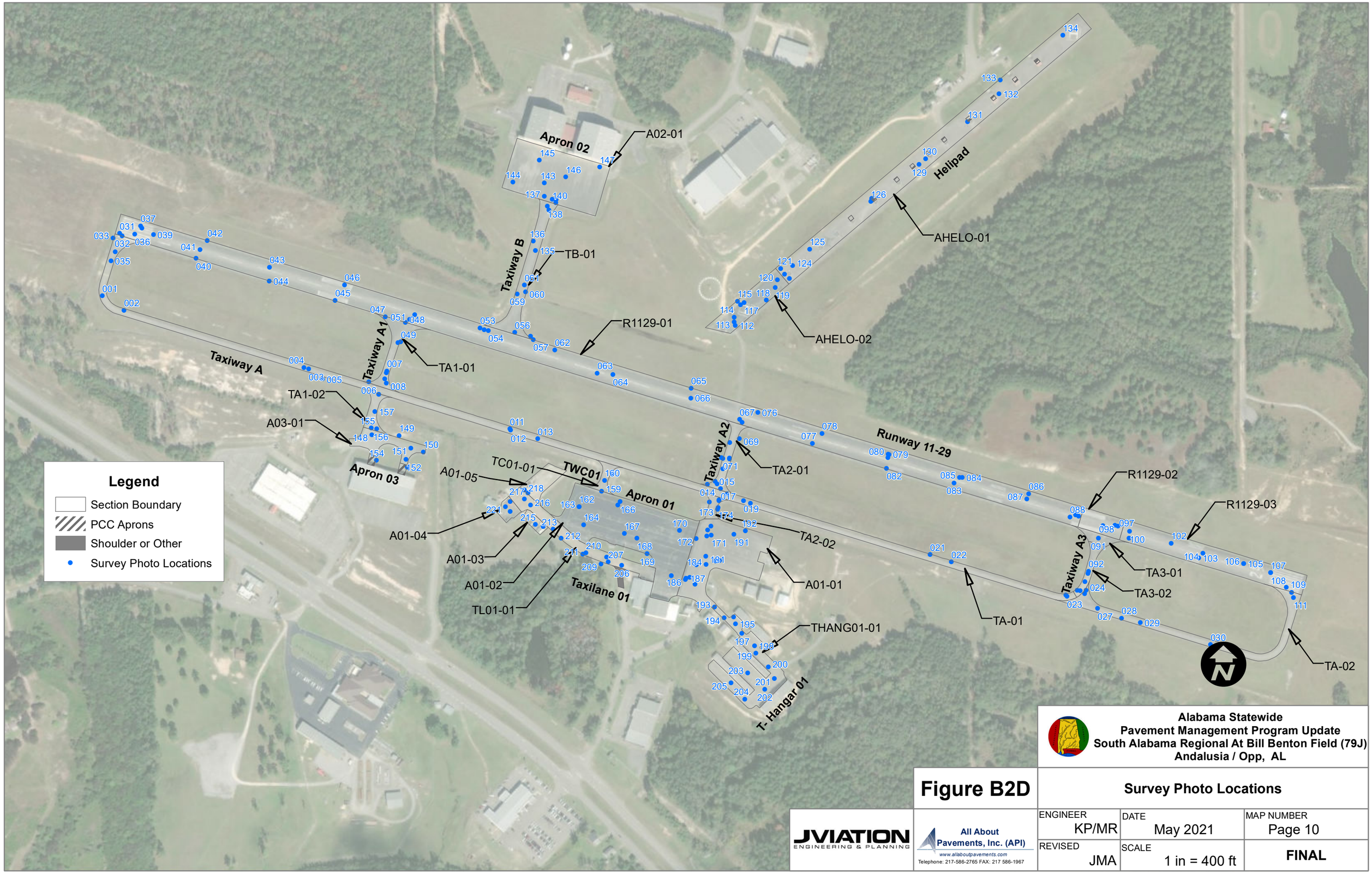
ENGINEER	DATE	MAP NUMBER
KP/MR	May 2021	Page 9
REVISED	SCALE	
JMA	1 in = 400 ft	**FINAL**



Alabama Statewide
Pavement Management Program Update
South Alabama Regional At Bill Benton Field (79J)
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Figure B2D

Survey Photo Locations

JVIATION ENGINEERING & PLANNING

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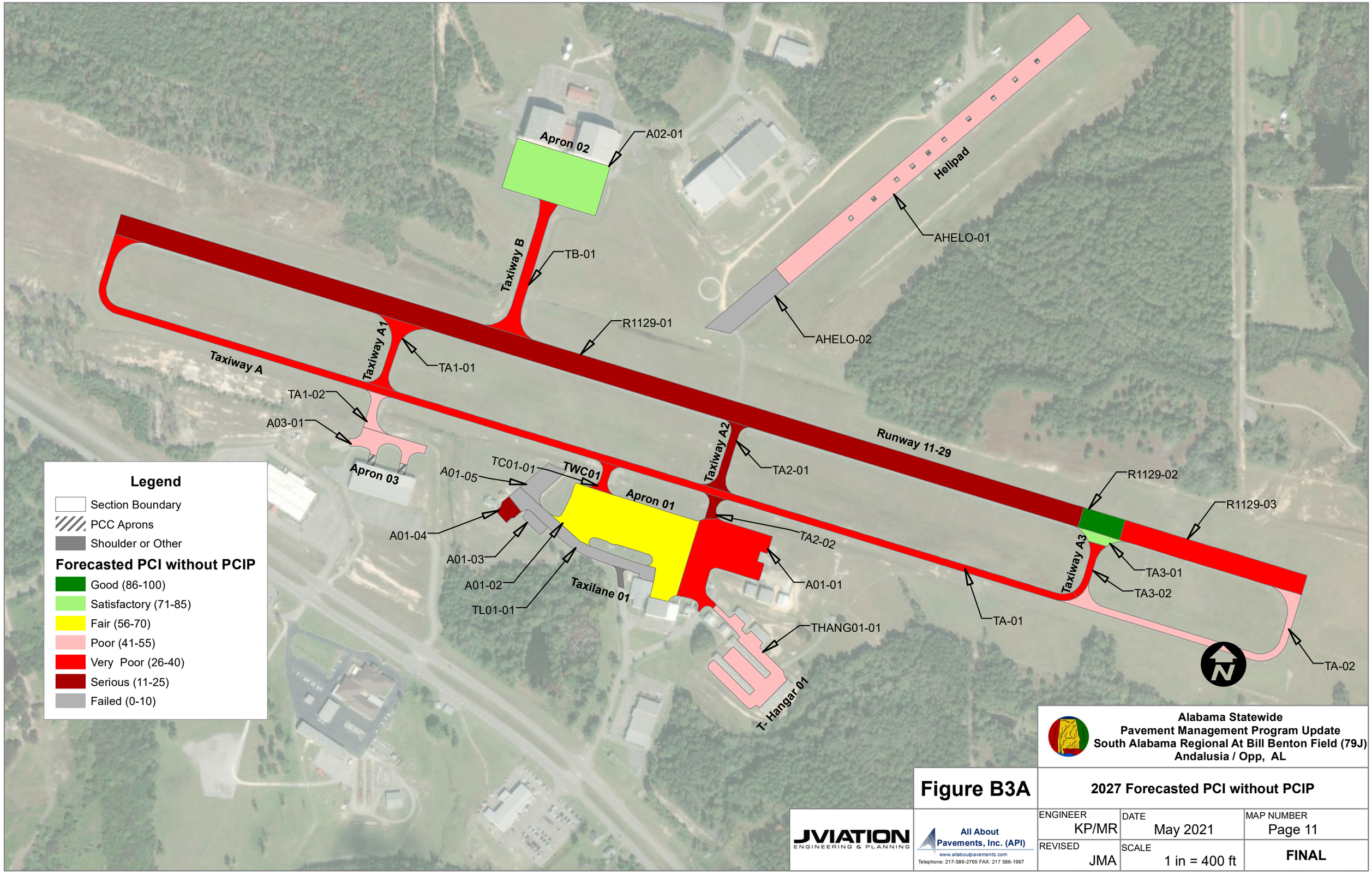
ENGINEER	DATE	MAP NUMBER
KP/MR	May 2021	Page 10
REVISED	SCALE	
JMA	1 in = 400 ft	FINAL



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South Alabama Regional At Bill Benton Field (79J)
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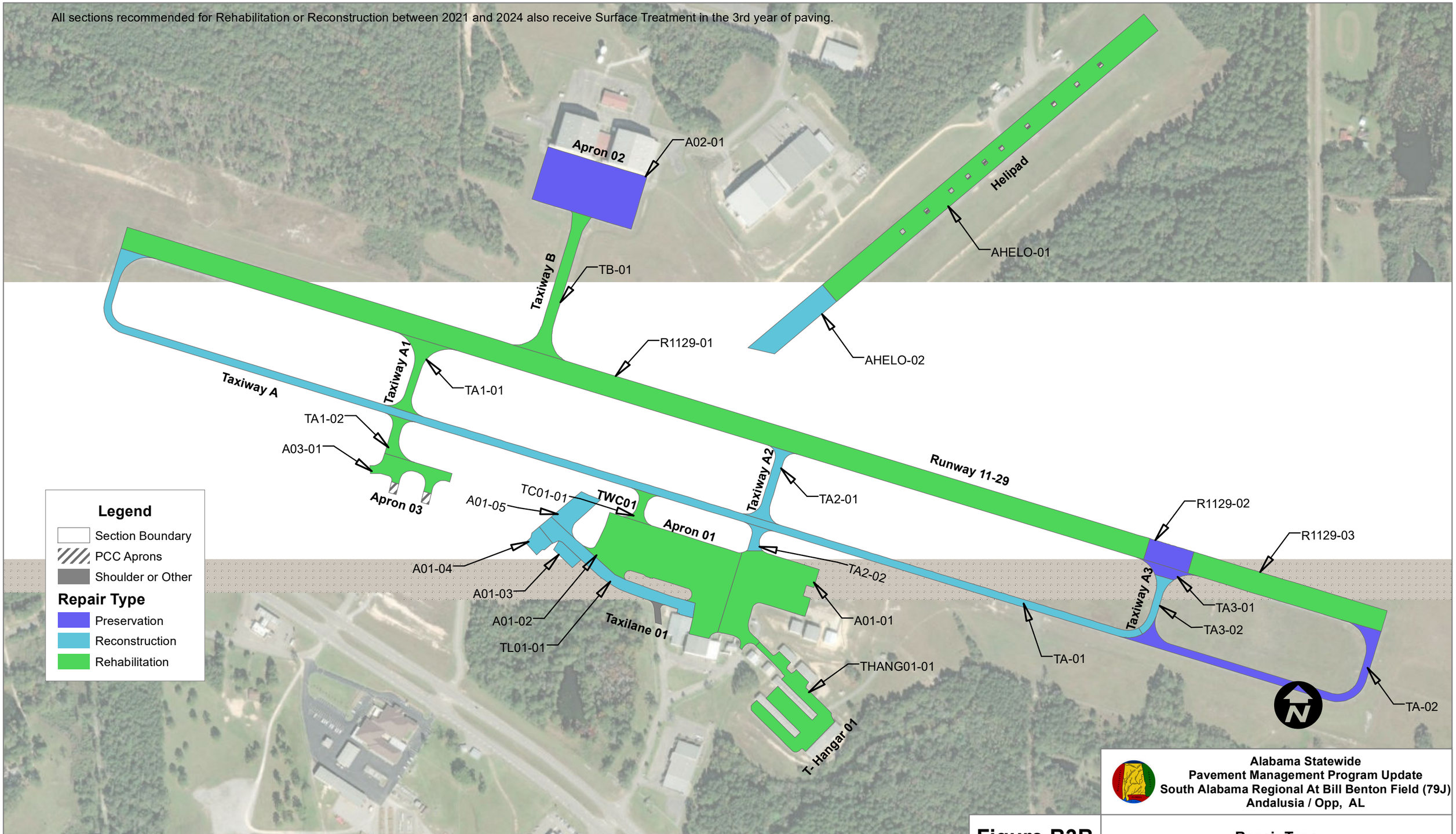
Figure B3A

2027 Forecasted PCI without PCIP

JVIATION ENGINEERING & PLANNING	All About Pavements, Inc. (API) www.allaboutpavements.com Telephone: 217-586-2765 FAX: 217 586-1967	ENGINEER KP/MR	DATE May 2021	MAP NUMBER Page 11
		REVISED JMA	SCALE 1 in = 400 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
- Reconstruction
- Rehabilitation

Alabama Statewide
Pavement Management Program Update
South Alabama Regional At Bill Benton Field (79J)
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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 = 400 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

Apron 02
A02-01
Helipad
AHELO-01
AHELO-02
Taxiway B
TB-01
R1129-01
Taxiway A1
TA1-01
Taxiway A
TA1-02
A03-01
Apron 03
TC01-01
TWC01
A01-05
Taxiway A2
TA2-01
Runway 11-29
Apron 01
R1129-02
R1129-03
A01-04
A01-03
A01-02
TL01-01
Taxilane 01
TA2-02
A01-01
Taxiway A3
TA3-01
TA3-02
TA-01
THANG01-01
T- Hangar 01
TA-02
N

Legend

Project Name

- 79J_21-01_Runway 11-29 Rehabilitation
- 79J_21-02_Apron 02 Preservation
- 79J_22-01_Taxiway A Reconstruction
- 79J_23-01_Apron 01 Rehabilitation
- 79J_23-02_Helo Apron Rehabilitation
- 79J_24-01_Apron 03 Rehabilitation
- 79J_24-02_Taxiway Hangar 01 Rehabilitation
- 79J_24-03_Runway 11-29 Surface Treatment
- 79J_27-01_Apron 01 Rehabilitation
- 79J_27-02_Apron 01 Reconstruction

M&R Activity

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

Alabama Statewide
Pavement Management Program Update
South Alabama Regional At Bill Benton Field (79J)
Andalusia / Opp, 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 = 400 ft	FINAL

APPENDIX C

OVERVIEW OF PAVEMENT DISTRESSES

1. Alligator Cracking (AC)

2. Bleeding (AC)

3. Block Cracking (AC)

-
-
-

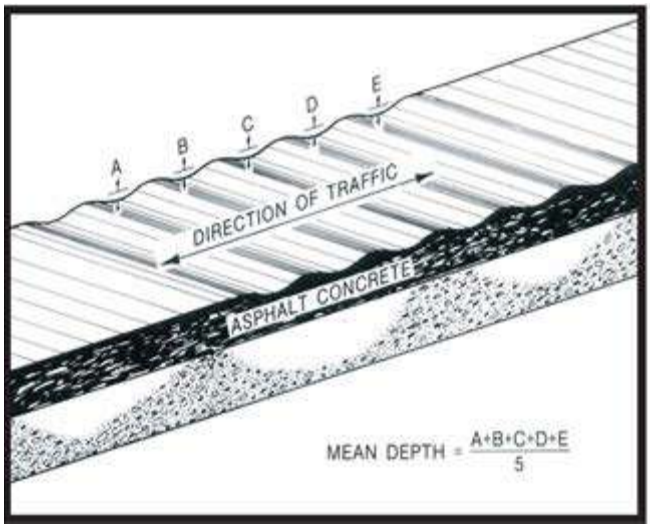
-
-
-

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

_____

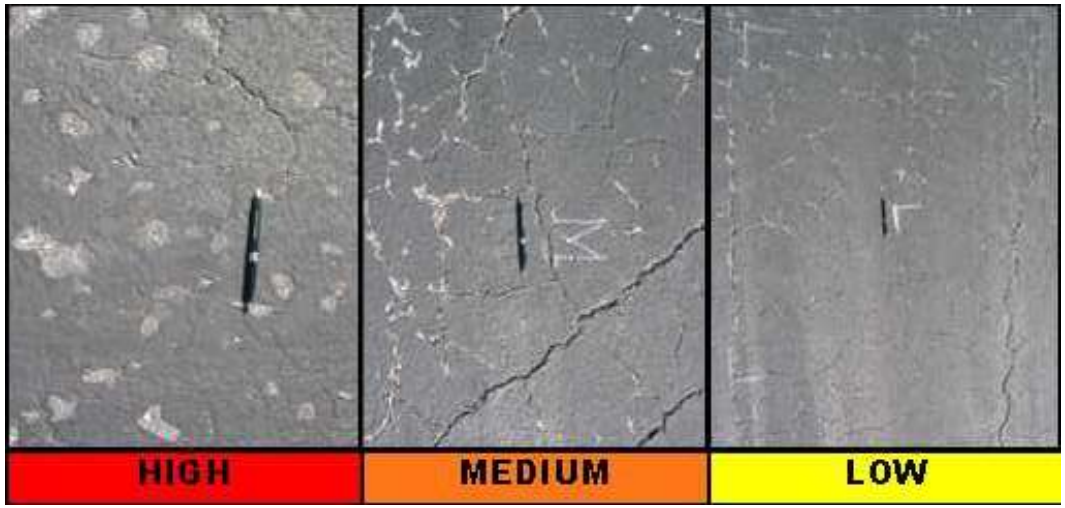
-
-
-

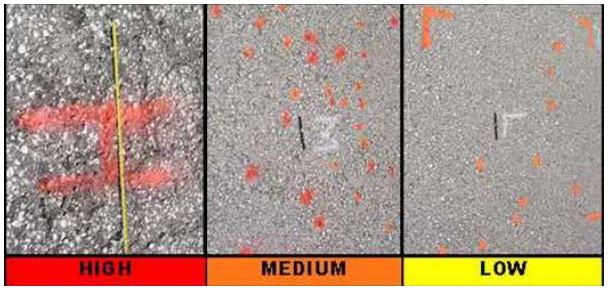
_____

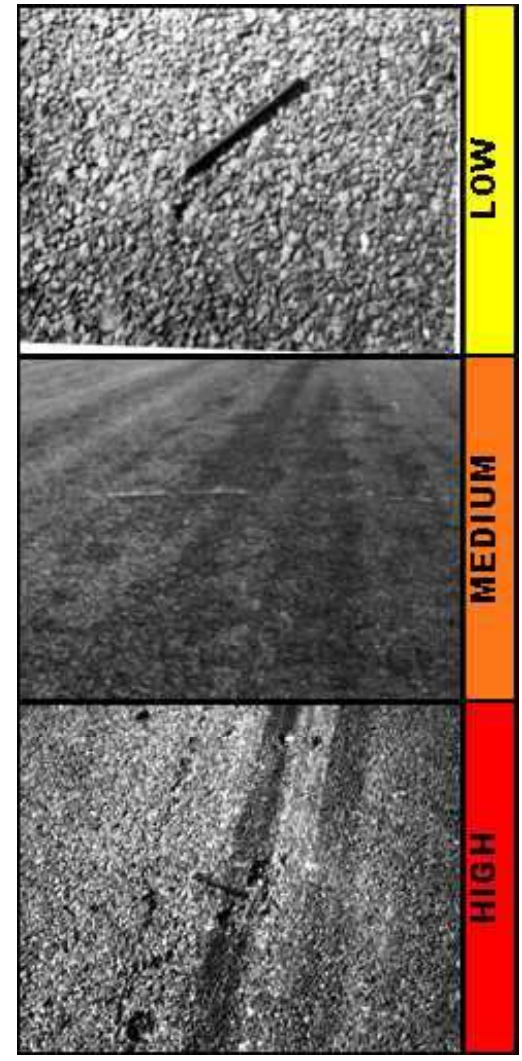
-
-
-

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

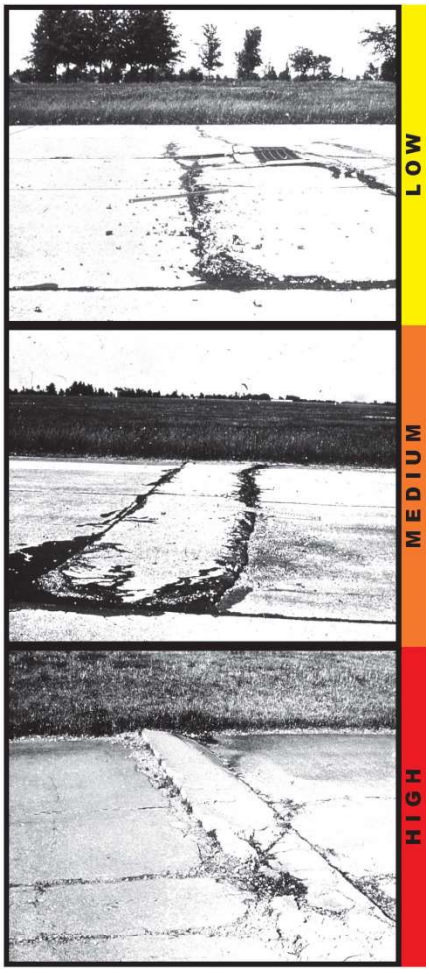
_____ No degrees of severity are defined. It is sufficient to indicate that a slippage

_____

- ♦
- ♦

15. Swelling (AC)

16. Weathering (AC)

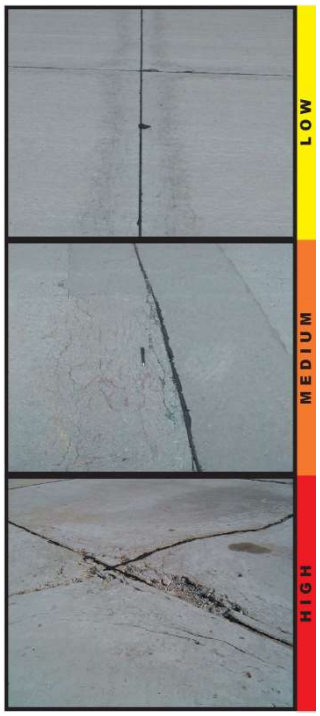

LOW
MEDIUM
HIGH

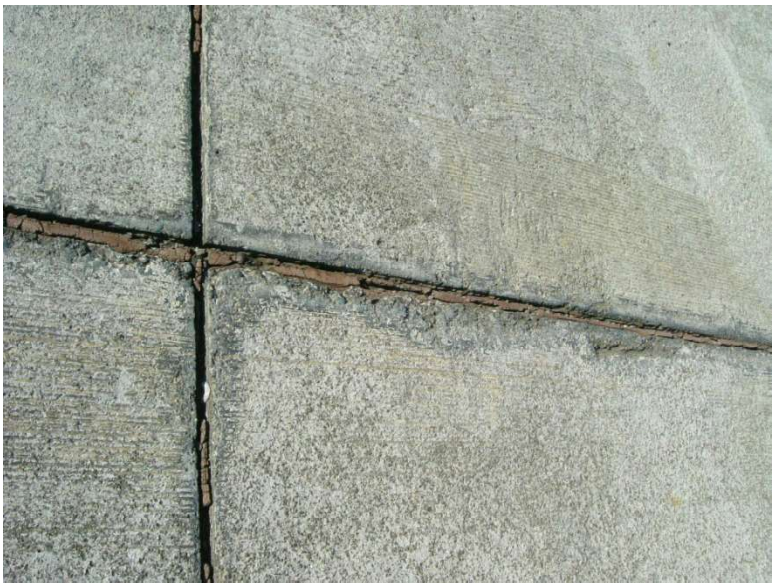
- filled, it has a mean width less than approximately 1 inch (3 millimeters); a filled crack can be of any width, but the filler material

- 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

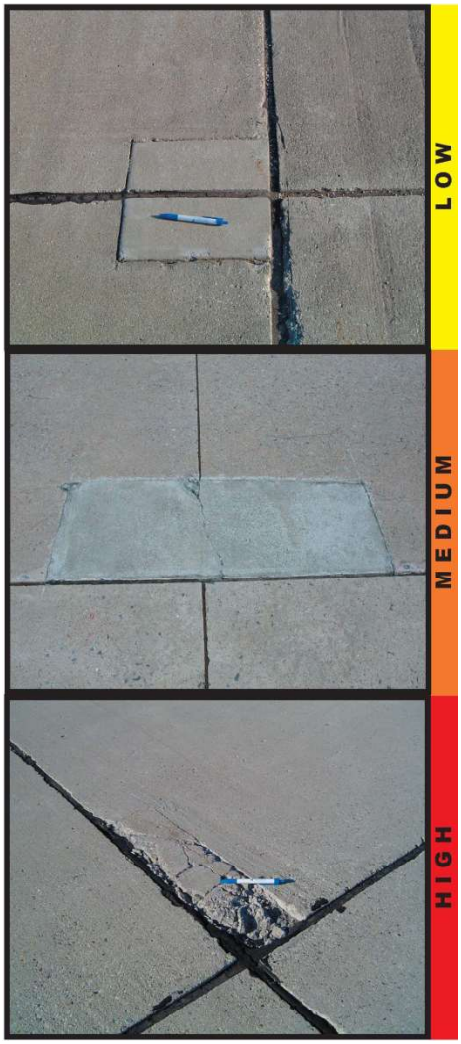
- One of the following conditions exists: (1) filled or non filled crack is severely spalled, causing definite FOD potential; (2) a non filled crack ha

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



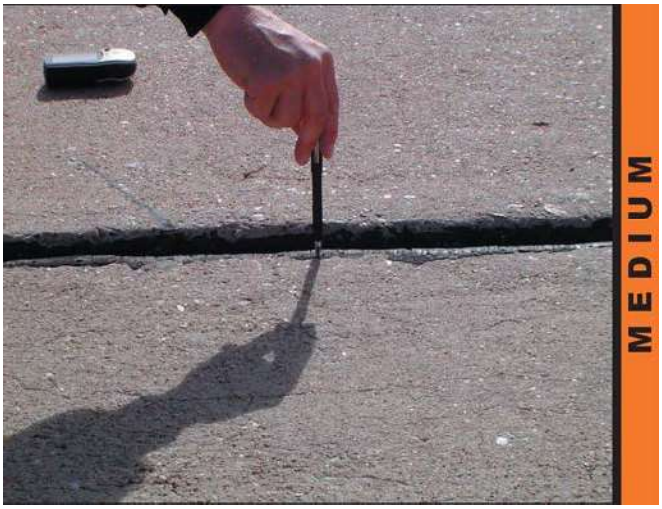
Patching is the same as defined

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

-
-
-



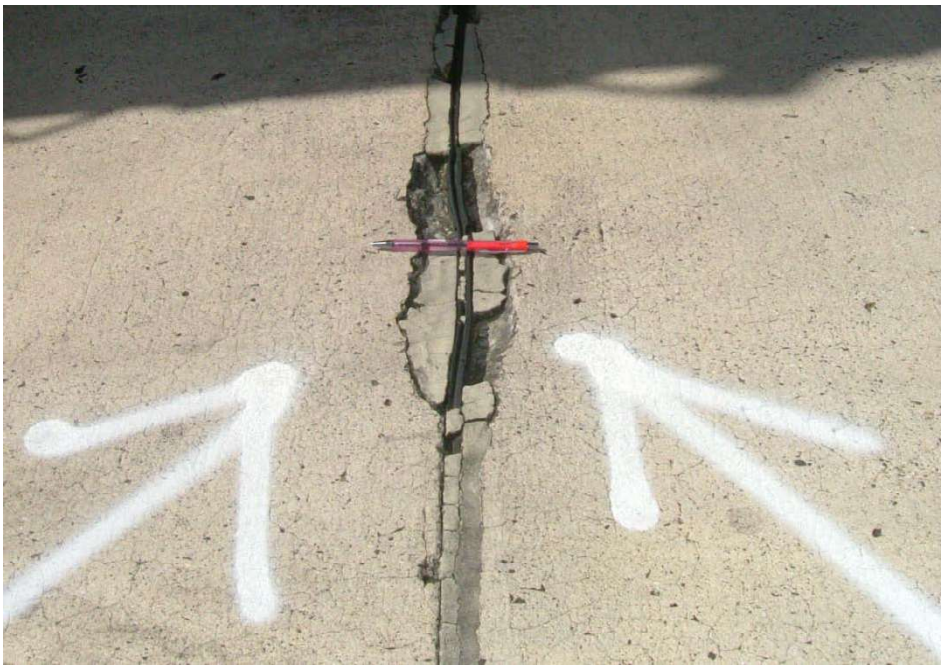
severity level of this distress type, as defined below,

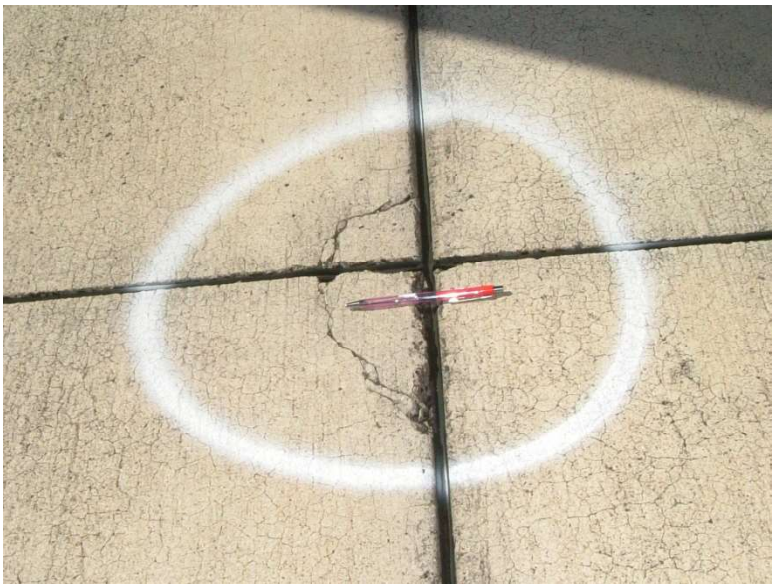
- Slab is broken into four or five pieces with the vast majority of the cracks
- (1) Slab is broken into four or five pieces with over 15 percent of the
- four or five pieces with some or all of the cracks of high severity; (2) slab is

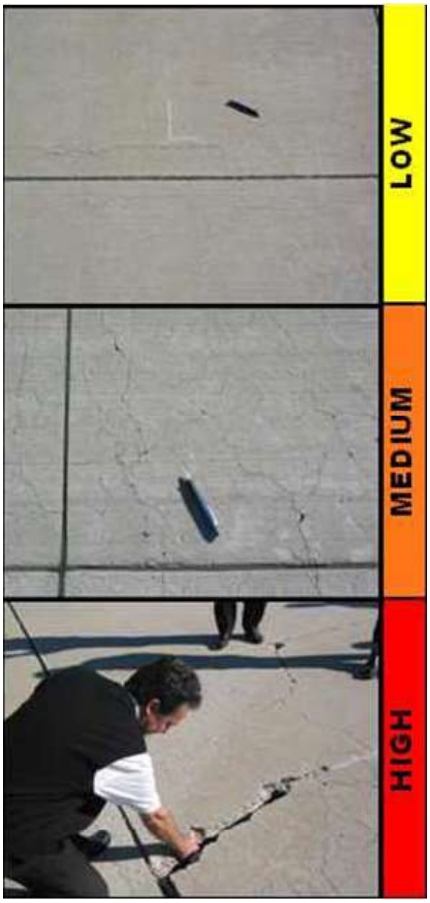
---

-
-
-

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

South Alabama Regional At Bill Benton Field (79J)

Branch ID	Section ID	Surface[1]	Area (sf)	Distress Number	Description	Distress Mechanism	Severity	Quantity	Quantity Units	Distress Density
A01	01	AC	104,102	42	BLEEDING	Other	N/A	96	SqFt	0.1%
A01	01	AC	104,102	43	BLOCK CRACKING	Climate/Durability	Low	10,373	SqFt	10.0%
A01	01	AC	104,102	43	BLOCK CRACKING	Climate/Durability	Medium	3,989	SqFt	3.8%
A01	01	AC	104,102	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	4,149	Ft	4.0%
A01	01	AC	104,102	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	3,056	Ft	2.9%
A01	01	AC	104,102	56	SWELLING	Other	Low	399	SqFt	0.4%
A01	01	AC	104,102	57	WEATHERING	Climate/Durability	Low	49,869	SqFt	47.9%
A01	01	AC	104,102	57	WEATHERING	Climate/Durability	Medium	49,869	SqFt	47.9%
A01	02	AC	173,391	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	18	Ft	0.0%
A01	02	AC	173,391	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	115	Ft	0.1%
A01	02	AC	173,391	52	RAVELING	Climate/Durability	Low	67,647	SqFt	39.0%
A01	03	AC	6,642	43	BLOCK CRACKING	Climate/Durability	High	3,321	SqFt	50.0%
A01	03	AC	6,642	43	BLOCK CRACKING	Climate/Durability	Medium	3,321	SqFt	50.0%
A01	03	AC	6,642	52	RAVELING	Climate/Durability	Medium	3,321	SqFt	50.0%
A01	03	AC	6,642	57	WEATHERING	Climate/Durability	High	3,321	SqFt	50.0%
A01	04	AC	7,931	43	BLOCK CRACKING	Climate/Durability	Medium	7,931	SqFt	100.0%
A01	04	AC	7,931	52	RAVELING	Climate/Durability	High	1,084	SqFt	13.7%
A01	04	AC	7,931	52	RAVELING	Climate/Durability	Low	1,798	SqFt	22.7%
A01	04	AC	7,931	57	WEATHERING	Climate/Durability	Medium	5,049	SqFt	63.7%
A01	05	AC	18,106	43	BLOCK CRACKING	Climate/Durability	Medium	18,106	SqFt	100.0%
A01	05	AC	18,106	52	RAVELING	Climate/Durability	Medium	9,053	SqFt	50.0%
A01	05	AC	18,106	57	WEATHERING	Climate/Durability	High	9,053	SqFt	50.0%
A02	01	AC	117,693	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	100	Ft	0.1%
A02	01	AC	117,693	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	450	Ft	0.4%
A02	01	AC	117,693	56	SWELLING	Other	Low	50	SqFt	0.0%
A02	01	AC	117,693	57	WEATHERING	Climate/Durability	Low	117,693	SqFt	100.0%

Appendix E

Distress Summary Report

South Alabama Regional At Bill Benton Field (79J)

Branch ID	Section ID	Surface[1]	Area (sf)	Distress Number	Description	Distress Mechanism	Severity	Quantity	Quantity Units	Distress Density
A03	01	AC	25,087	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	38	Ft	0.2%
A03	01	AC	25,087	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	535	Ft	2.1%
A03	01	AC	25,087	52	RAVELING	Climate/Durability	Low	859	SqFt	3.4%
A03	01	AC	25,087	57	WEATHERING	Climate/Durability	Low	12,115	SqFt	48.3%
A03	01	AC	25,087	57	WEATHERING	Climate/Durability	Medium	12,113	SqFt	48.3%
AHELO	01	AC	191,500	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	622	Ft	0.3%
AHELO	01	AC	191,500	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	13,044	Ft	6.8%
AHELO	01	AC	191,500	52	RAVELING	Climate/Durability	High	320	SqFt	0.2%
AHELO	01	AC	191,500	52	RAVELING	Climate/Durability	Low	95,590	SqFt	49.9%
AHELO	01	AC	191,500	57	WEATHERING	Climate/Durability	Medium	95,590	SqFt	49.9%
AHELO	02	AC	40,750	43	BLOCK CRACKING	Climate/Durability	High	18,480	SqFt	45.3%
AHELO	02	AC	40,750	43	BLOCK CRACKING	Climate/Durability	Medium	22,270	SqFt	54.7%
AHELO	02	AC	40,750	50	PATCHING	Climate/Durability	High	102	SqFt	0.3%
AHELO	02	AC	40,750	52	RAVELING	Climate/Durability	High	815	SqFt	2.0%
AHELO	02	AC	40,750	57	WEATHERING	Climate/Durability	High	24,480	SqFt	60.1%
AHELO	02	AC	40,750	57	WEATHERING	Climate/Durability	Medium	15,352	SqFt	37.7%
R1129	01	AC	487,000	45	DEPRESSION	Other	Low	325	SqFt	0.1%
R1129	01	AC	487,000	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	High	325	Ft	0.1%
R1129	01	AC	487,000	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	5,519	Ft	1.1%
R1129	01	AC	487,000	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	25,811	Ft	5.3%
R1129	01	AC	487,000	52	RAVELING	Climate/Durability	Low	55,518	SqFt	11.4%
R1129	01	AC	487,000	56	SWELLING	Other	Low	4,545	SqFt	0.9%
R1129	01	AC	487,000	57	WEATHERING	Climate/Durability	Low	196,099	SqFt	40.3%
R1129	01	AC	487,000	57	WEATHERING	Climate/Durability	Medium	235,383	SqFt	48.3%
R1129	02	AAC	21,000	57	WEATHERING	Climate/Durability	Low	840	SqFt	4.0%

Appendix E

Distress Summary Report

South Alabama Regional At Bill Benton Field (79J)

Branch ID	Section ID	Surface[1]	Area (sf)	Distress Number	Description	Distress Mechanism	Severity	Quantity	Quantity Units	Distress Density
R1129	03	AC	92,000	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	5,888	Ft	0.6%
R1129	03	AC	92,000	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	27,600	Ft	3.0%
R1129	03	AC	92,000	52	RAVELING	Climate/Durability	Low	14,720	SqFt	1.6%
R1129	03	AC	92,000	57	WEATHERING	Climate/Durability	Low	636,640	SqFt	69.2%
R1129	03	AC	92,000	57	WEATHERING	Climate/Durability	Medium	268,640	SqFt	29.2%
TA	01	AC	185,489	43	BLOCK CRACKING	Climate/Durability	Low	7,779	SqFt	4.2%
TA	01	AC	185,489	43	BLOCK CRACKING	Climate/Durability	Medium	3,380	SqFt	1.8%
TA	01	AC	185,489	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	2,962	Ft	1.6%
TA	01	AC	185,489	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	13,208	Ft	7.1%
TA	01	AC	185,489	52	RAVELING	Climate/Durability	Low	34,154	SqFt	18.4%
TA	01	AC	185,489	57	WEATHERING	Climate/Durability	Low	75,668	SqFt	40.8%
TA	01	AC	185,489	57	WEATHERING	Climate/Durability	Medium	75,668	SqFt	40.8%
TA	02	AC	55,061	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	166	Ft	0.3%
TA	02	AC	55,061	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	1,007	Ft	1.8%
TA	02	AC	55,061	55	SLIPPAGE CRACKING	Other	N/A	375	SqFt	0.7%
TA	02	AC	55,061	57	WEATHERING	Climate/Durability	Low	22,443	SqFt	40.8%
TA1	01	AC	21,365	43	BLOCK CRACKING	Climate/Durability	Low	214	SqFt	1.0%
TA1	01	AC	21,365	45	DEPRESSION	Other	Low	115	SqFt	0.5%
TA1	01	AC	21,365	45	DEPRESSION	Other	Medium	53	SqFt	0.3%
TA1	01	AC	21,365	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	123	Ft	0.6%
TA1	01	AC	21,365	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	1,210	Ft	5.7%
TA1	01	AC	21,365	52	RAVELING	Climate/Durability	Low	2,084	SqFt	9.8%
TA1	01	AC	21,365	56	SWELLING	Other	Medium	72	SqFt	0.3%
TA1	01	AC	21,365	57	WEATHERING	Climate/Durability	Low	9,640	SqFt	45.1%

Appendix E

Distress Summary Report

South Alabama Regional At Bill Benton Field (79J)

Branch ID	Section ID	Surface[1]	Area (sf)	Distress Number	Description	Distress Mechanism	Severity	Quantity	Quantity Units	Distress Density
TA1	01	AC	21,365	57	WEATHERING	Climate/Durability	Medium	9,640	SqFt	45.1%
TA1	02	AC	10,751	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	3	Ft	0.0%
TA1	02	AC	10,751	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	211	Ft	2.0%
TA1	02	AC	10,751	52	RAVELING	Climate/Durability	Low	700	SqFt	6.5%
TA1	02	AC	10,751	57	WEATHERING	Climate/Durability	Low	5,025	SqFt	46.7%
TA1	02	AC	10,751	57	WEATHERING	Climate/Durability	Medium	5,025	SqFt	46.7%
TA2	01	AC	16,671	42	BLEEDING	Other	N/A	72	SqFt	0.4%
TA2	01	AC	16,671	43	BLOCK CRACKING	Climate/Durability	Low	2,390	SqFt	14.3%
TA2	01	AC	16,671	43	BLOCK CRACKING	Climate/Durability	Medium	1,785	SqFt	10.7%
TA2	01	AC	16,671	48	LONGITUDINAL/TRANSVERSE	Climate/Durability	High	3	Ft	0.0%
TA2	01	AC	16,671	48	LONGITUDINAL/TRANSVERSE	Climate/Durability	Low	471	Ft	2.8%
TA2	01	AC	16,671	48	LONGITUDINAL/TRANSVERSE	Climate/Durability	Medium	941	Ft	5.6%
TA2	01	AC	16,671	52	RAVELING	Climate/Durability	Low	2,364	SqFt	14.2%
TA2	01	AC	16,671	56	SWELLING	Other	Low	65	SqFt	0.4%
TA2	01	AC	16,671	56	SWELLING	Other	Medium	22	SqFt	0.1%
TA2	01	AC	16,671	57	WEATHERING	Climate/Durability	Low	7,116	SqFt	42.7%
TA2	01	AC	16,671	57	WEATHERING	Climate/Durability	Medium	7,116	SqFt	42.7%
TA2	02	AC	6,171	42	BLEEDING	Other	N/A	138	SqFt	2.2%
TA2	02	AC	6,171	43	BLOCK CRACKING	Climate/Durability	Low	436	SqFt	7.1%
TA2	02	AC	6,171	43	BLOCK CRACKING	Climate/Durability	Medium	120	SqFt	1.9%
TA2	02	AC	6,171	45	DEPRESSION	Other	Low	50	SqFt	0.8%
TA2	02	AC	6,171	45	DEPRESSION	Other	Medium	10	SqFt	0.2%
TA2	02	AC	6,171	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	64	Ft	1.0%
TA2	02	AC	6,171	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	341	Ft	5.5%
TA2	02	AC	6,171	57	WEATHERING	Climate/Durability	Low	3,016	SqFt	48.9%
TA2	02	AC	6,171	57	WEATHERING	Climate/Durability	Medium	3,061	SqFt	49.6%
TA3	01	AC	7,657	57	WEATHERING	Climate/Durability	Low	400	SqFt	5.2%
TA3	02	AC	10,684	43	BLOCK CRACKING	Climate/Durability	Low	2,930	SqFt	27.4%

Appendix E

Distress Summary Report

South Alabama Regional At Bill Benton Field (79J)

Branch ID	Section ID	Surface[1]	Area (sf)	Distress Number	Description	Distress Mechanism	Severity	Quantity	Quantity Units	Distress Density
TA3	02	AC	10,684	43	BLOCK CRACKING	Climate/Durability	Medium	1,465	SqFt	13.7%
TA3	02	AC	10,684	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	187	Ft	1.8%
TA3	02	AC	10,684	52	RAVELING	Climate/Durability	Low	1,832	SqFt	17.1%
TA3	02	AC	10,684	57	WEATHERING	Climate/Durability	Low	4,426	SqFt	41.4%
TA3	02	AC	10,684	57	WEATHERING	Climate/Durability	Medium	4,426	SqFt	41.4%
TB	01	AC	41,226	43	BLOCK CRACKING	Climate/Durability	Low	246	SqFt	0.6%
TB	01	AC	41,226	48	LONGITUDINAL/TRANSVERSE	Climate/Durability	Low	492	Ft	1.2%
TB	01	AC	41,226	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	2,357	Ft	5.7%
TB	01	AC	41,226	52	RAVELING	Climate/Durability	Low	3,569	SqFt	8.7%
TB	01	AC	41,226	56	SWELLING	Other	Low	589	SqFt	1.4%
TB	01	AC	41,226	56	SWELLING	Other	Medium	21	SqFt	0.0%
TB	01	AC	41,226	57	WEATHERING	Climate/Durability	Low	18,828	SqFt	45.7%
TB	01	AC	41,226	57	WEATHERING	Climate/Durability	Medium	18,828	SqFt	45.7%
TC01	01	AC	7,691	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	498	Ft	6.5%
TC01	01	AC	7,691	52	RAVELING	Climate/Durability	Low	140	SqFt	1.8%
TC01	01	AC	7,691	57	WEATHERING	Climate/Durability	Medium	7,551	SqFt	98.2%
THANG01	01	AC	68,479	45	DEPRESSION	Other	Low	1,499	SqFt	2.2%
THANG01	01	AC	68,479	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Low	617	Ft	0.9%
THANG01	01	AC	68,479	48	LONGITUDINAL/TRANSVERSE CRACKING	Climate/Durability	Medium	354	Ft	0.5%
THANG01	01	AC	68,479	52	RAVELING	Climate/Durability	Low	1,161	SqFt	1.7%
THANG01	01	AC	68,479	57	WEATHERING	Climate/Durability	Low	33,279	SqFt	48.6%
THANG01	01	AC	68,479	57	WEATHERING	Climate/Durability	Medium	33,279	SqFt	48.6%
TL01	01	AC	44,710	41	ALLIGATOR CRACKING	Load	High	106	SqFt	0.2%
TL01	01	AC	44,710	43	BLOCK CRACKING	Climate/Durability	High	6,906	SqFt	15.4%
TL01	01	AC	44,710	43	BLOCK CRACKING	Climate/Durability	Medium	37,574	SqFt	84.0%
TL01	01	AC	44,710	45	DEPRESSION	Other	High	851	SqFt	1.9%
TL01	01	AC	44,710	45	DEPRESSION	Other	Medium	426	SqFt	1.0%

Appendix E

Distress Summary Report

South Alabama Regional At Bill Benton Field (79J)

Branch ID	Section ID	Surface[1]	Area (sf)	Distress Number	Description	Distress Mechanism	Severity	Quantity	Quantity Units	Distress Density
TL01	01	AC	44,710	50	PATCHING	Climate/Durability	Medium	124	SqFt	0.3%
TL01	01	AC	44,710	52	RAVELING	Climate/Durability	High	213	SqFt	0.5%
TL01	01	AC	44,710	52	RAVELING	Climate/Durability	Medium	4,273	SqFt	9.6%
TL01	01	AC	44,710	57	WEATHERING	Climate/Durability	High	8,790	SqFt	19.7%
TL01	01	AC	44,710	57	WEATHERING	Climate/Durability	Medium	31,310	SqFt	70.0%

[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

South Alabama Regional At Bill Benton Field (79J)

Branch ID	Section ID	Forecasted PCI						
		2021	2022	2023	2024	2025	2026	2027
A01	01	52	50	48	46	44	41	39
A01	02	77	75	73	71	69	66	64
A01	03	7	5	3	1	0	0	0
A01	04	24	22	20	18	16	13	11
A01	05	15	13	11	9	7	4	2
A02	01	85	83	81	79	77	74	72
A03	01	67	65	63	61	59	56	54
AHELO	01	55	53	51	49	47	44	42
AHELO	02	8	6	4	2	0	0	0
R1129	01	49	45	41	36	32	28	23
R1129	02	98	97	96	94	92	90	87
R1129	03	60	54	50	45	41	37	32
TA	01	45	43	39	36	32	29	25
TA	02	76	74	71	68	64	60	55
TA1	01	46	44	40	37	33	30	26
TA1	02	64	59	54	49	46	44	40
TA2	01	39	35	32	28	25	21	18
TA2	02	36	32	29	25	22	18	15
TA3	01	98	96	94	92	89	86	84
TA3	02	46	44	40	37	33	30	26
TB	01	45	43	39	36	32	29	25
TC01	01	58	53	48	45	43	39	36
THANG01	01	66	62	57	52	48	45	43
TL01	01	15	11	8	4	1	0	0

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	5	1,396.00	135.80	310,172.00	APRON	38.00	25.92	65.14
A02	1	472.00	249.00	117,693.00	APRON	88.00	0.00	88.00
A03	1	481.00	40.00	25,087.00	APRON	70.00	0.00	70.00
AHELO	2	2,327.00	100.00	232,250.00	HELIPAD	34.50	23.50	49.75
R1129	3	6,000.00	100.00	600,000.00	RUNWAY	73.67	18.80	57.72
TA	2	6,590.00	35.00	240,550.00	TAXIWAY	63.50	14.50	55.64
TA1	2	509.00	42.50	32,116.00	TAXIWAY	59.00	9.00	56.03
TA2	2	439.00	40.00	22,842.00	TAXIWAY	41.50	1.50	42.19
TA3	2	322.00	109.00	18,341.00	TAXIWAY	74.50	24.50	70.46
TB	1	650.00	50.00	41,226.00	TAXIWAY	49.00	0.00	49.00
TC01	1	140.00	30.00	7,691.00	TAXIWAY	63.00	0.00	63.00
THANG01	1	500.00	175.00	68,479.00	TAXIWAY	70.00	0.00	70.00
TL01	1	790.00	50.00	44,710.00	TAXIWAY	19.00	0.00	19.00

Pavement Database: ALDOT_Combined_201201

Use Category	Number of Sections	Total Area (SqFt)	Arithmetic Average PCI	Average STD PCI	Weighted Average PCI
APRON	7	452,952.00	49.71	29.08	71.35
HELIPAD	2	232,250.00	34.50	23.50	49.75
RUNWAY	3	600,000.00	73.67	18.80	57.72
TAXIWAY	12	475,955.00	56.50	19.75	53.76
ALL	24	1,761,157.00	54.83	24.90	59.10

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.

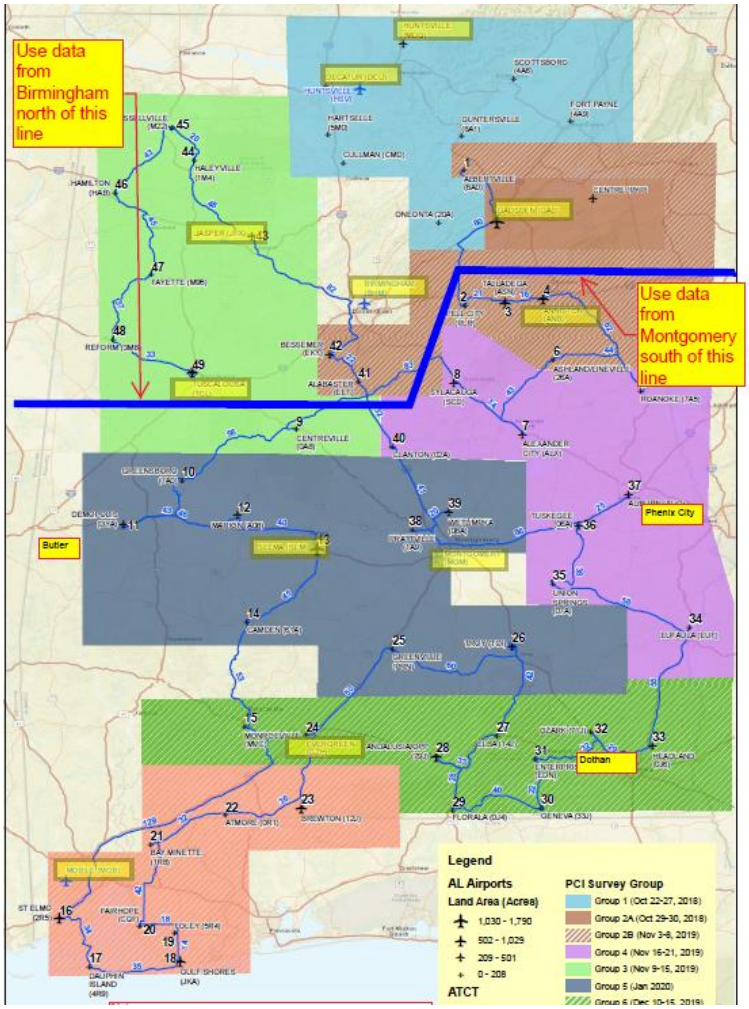

Figure 1: RSMeans Unit Costs Locations.

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 [illegible] 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 [illegible] 150/5320-6F. The pavement sections used for developing the cost estimates are:

- [illegible]2,500 lbs   4[illegible] [illegible]-403 (State HMA Mix) + 6[illegible] P-209 Base
- 12,500 [illegible] 30,000 lbs   [illegible] [illegible]-403 (State HMA Mix) + 8[illegible] [illegible]-209 Base
- 30,000 [illegible] 100,000 lbs   [illegible] [illegible]-401 + 10[illegible] [illegible]-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 [illegible] 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

South Alabama Regional Airport at Bell Benton Field (79J)

Branch & Section	2021	2022	2023	2024	2025	2026	2027
A01-01	StopGap $2940.1 Before:51.6 After:51.6	StopGap $3254.43 Before:49.39 After:49.39	Required Project Major Below Critical $610037.72 Before:47.18 After:100	Preventive $257.86 Before:97.78 After:97.78	Preventive $530.11 Before:95.57 After:95.57	Preventive + Required Project Global MR $71607.82 Before:93.36 After:97.79	Preventive $561.24 Before:95.58 After:95.58
A01-02	Preventive + (TW-ST) Taxiway and Apron Surface Treatment $151473.54 Before:76.6 After:83.23	Preventive $3464.37 Before:81.02 After:81.02	Preventive $3963.07 Before:78.81 After:78.81	Preventive $4472.73 Before:76.59 After:76.59	Preventive $5007.59 Before:74.38 After:74.38	Preventive $5570.52 Before:72.17 After:72.17	Required Project Major Above Critical $910302.75 Before:69.96 After:100
A01-03	StopGap $12765.53 Before:6.6 After:6.6	StopGap $19559.15 Before:4.39 After:4.39	StopGap $26748.96 Before:2.18 After:2.18	StopGap $34260.18 Before:0 After:0	StopGap $35287.99 Before:0 After:0	StopGap $36346.63 Before:0 After:0	Required Project Major Below Critical $80633.88 Before:0 After:100
A01-04	StopGap $1867.97 Before:23.6 After:23.6	StopGap $1996.11 Before:21.39 After:21.39	StopGap $2261.73 Before:19.18 After:19.18	StopGap $2772.81 Before:16.96 After:16.96	StopGap $3310.53 Before:14.75 After:14.75	StopGap $3878.01 Before:12.54 After:12.54	Required Project Major Below Critical $96282.34 Before:10.33 After:100

South Alabama Regional Airport at Bell Benton Field (79J)

Branch & Section	2021	2022	2023	2024	2025	2026	2027
A01-05	StopGap $6777.53 Before:14.6 After:14.6	StopGap $7930.47 Before:12.39 After:12.39	StopGap $9146.49 Before:10.18 After:10.18	StopGap $26616.48 Before:7.96 After:7.96	StopGap $46510.76 Before:5.75 After:5.75	StopGap $67574.75 Before:3.54 After:3.54	Required Project Major Below Critical $219806.84 Before:1.33 After:100
A02-01	Preventive + Required Project Global MR $105422.07 Before:84.6 After:91.23	Preventive $1360.46 Before:89.02 After:89.02	Preventive $1683.15 Before:86.81 After:86.81	Preventive $2025.17 Before:84.59 After:84.59	Preventive $2384.97 Before:82.38 After:82.38	Preventive $2764.54 Before:80.17 After:80.17	Preventive $3138.62 Before:77.96 After:77.96
A03-01	Preventive $1173.72 Before:66.6 After:66.6	StopGap $412.18 Before:64.39 After:64.39	StopGap $484.63 Before:62.18 After:62.18	Required Project Major Below Critical $120417.6 Before:59.96 After:100	Preventive $63.74 Before:97.79 After:97.79	Preventive $131.31 Before:95.58 After:95.58	Preventive + Required Project Global MR $17763.78 Before:93.37 After:97.79
AHELO-01	StopGap $4874.72 Before:54.6 After:54.6	StopGap $5425.93 Before:52.39 After:52.39	Required Project Major Below Critical $1122190 Before:50.18 After:100	Preventive $474.35 Before:97.78 After:97.78	Preventive $975.16 Before:95.57 After:95.57	Preventive + Required Project Global MR $131725.59 Before:93.36 After:97.79	Preventive $1032.42 Before:95.58 After:95.58

South Alabama Regional Airport at Bell Benton Field (79J)

Branch & Section	2021	2022	2023	2024	2025	2026	2027
AHELO-02	StopGap $61040.71 Before:7.6 After:7.6	StopGap $102202.56 Before:5.39 After:5.39	Required Project Major Below Critical $439692.5 Before:3.18 After:100	Preventive $100.94 Before:97.78 After:97.78	Preventive $207.51 Before:95.57 After:95.57	Preventive + Required Project Global MR $28030.38 Before:93.36 After:97.79	Preventive $219.69 Before:95.58 After:95.58
R1129-01	Required Project Major Below Critical $2693110 Before:47.43 After:100	Preventive $666.4 Before:98.7 After:98.7	Preventive $1329.58 Before:97.48 After:97.48	Preventive + Required Project Global MR $313608.13 Before:96.45 After:98.7	Preventive $1410.55 Before:97.48 After:97.48	Preventive $2045.55 Before:96.45 After:96.45	Preventive $2701.17 Before:95.45 After:95.45
R1129-02	Preventive $61.46 Before:97.14 After:97.14	Preventive $85 Before:96.15 After:96.15	Preventive $111.77 Before:95.09 After:95.09	Preventive + Required Project Global MR $13588.59 Before:93.66 After:96.15	Preventive $118.57 Before:95.09 After:95.09	Preventive $157.64 Before:93.66 After:93.66	Preventive $215.25 Before:91.6 After:91.6
R1129-03	Required Project Major Below Critical $404800 Before:56.47 After:100	Preventive $125.89 Before:98.7 After:98.7	Preventive $251.17 Before:97.48 After:97.48	Preventive + Required Project Global MR $59244.25 Before:96.45 After:98.7	Preventive $266.47 Before:97.48 After:97.48	Preventive $386.43 Before:96.45 After:96.45	Preventive $510.28 Before:95.45 After:95.45

South Alabama Regional Airport at Bell Benton Field (79J)

Branch & Section	2021	2022	2023	2024	2025	2026	2027
TA-01	StopGap $6444.95 Before:45.09 After:45.09	Required Project Major Below Critical $1943924.72 Before:41.69 After:100	Preventive $204.76 Before:98.98 After:98.98	Preventive $446.28 Before:97.85 After:97.85	Preventive + Required Project Global MR $123206.31 Before:96.33 After:98.98	Preventive $473.46 Before:97.85 After:97.85	Preventive $831.29 Before:96.33 After:96.33
TA-02	Preventive + Required Project Global MR $49836.87 Before:74.96 After:80.98	Preventive $1216.56 Before:78.91 After:78.91	Preventive $1359.43 Before:76.95 After:76.95	Preventive $1512 Before:74.95 After:74.95	Preventive $1685.75 Before:72.72 After:72.72	Preventive $1895.84 Before:70.03 After:70.03	StopGap $892.99 Before:66.71 After:66.71
TA1-01	Required Project Major Below Critical $118148.45 Before:45.24 After:100	Preventive $22.9 Before:98.98 After:98.98	Preventive $49.91 Before:97.85 After:97.85	Preventive + Required Project Global MR $13761.22 Before:96.33 After:98.98	Preventive $52.95 Before:97.85 After:97.85	Preventive $92.96 Before:96.33 After:96.33	Preventive $146.94 Before:94.36 After:94.36
TA1-02	StopGap $198.86 Before:61.9 After:61.9	StopGap $255.55 Before:57.16 After:57.16	StopGap $315.56 Before:52.22 After:52.22	Required Project Major Below Critical $64936.04 Before:47.83 After:100	Preventive $12.59 Before:98.98 After:98.98	Preventive $27.44 Before:97.85 After:97.85	Preventive + Required Project Global MR $7573.84 Before:96.33 After:98.98

South Alabama Regional Airport at Bell Benton Field (79J)

Branch & Section	2021	2022	2023	2024	2025	2026	2027
TA2-01	Required Project Major Below Critical $169544.07 Before:37.54 After:100	Preventive $17.87 Before:98.98 After:98.98	Preventive $38.94 Before:97.85 After:97.85	Preventive + Required Project Global MR $10737.81 Before:96.33 After:98.98	Preventive $41.31 Before:97.85 After:97.85	Preventive $72.54 Before:96.33 After:96.33	Preventive $114.66 Before:94.36 After:94.36
TA2-02	StopGap $819.37 Before:34.54 After:34.54	Required Project Major Below Critical $64672.08 Before:31 After:100	Preventive $6.81 Before:98.98 After:98.98	Preventive $14.85 Before:97.85 After:97.85	Preventive + Required Project Global MR $4098.93 Before:96.33 After:98.98	Preventive $15.75 Before:97.85 After:97.85	Preventive $27.66 Before:96.33 After:96.33
TA3-01	Preventive + Required Project Global MR $6760.64 Before:97.13 After:100	Preventive $8.21 Before:98.98 After:98.98	Preventive $17.89 Before:97.85 After:97.85	Preventive $31.4 Before:96.33 After:96.33	Preventive $49.8 Before:94.35 After:94.35	Preventive $72.65 Before:91.99 After:91.99	Preventive $99.12 Before:89.39 After:89.39
TA3-02	StopGap $369.64 Before:45.24 After:45.24	Required Project Major Below Critical $111968.32 Before:42.52 After:100	Preventive $11.79 Before:98.98 After:98.98	Preventive $25.71 Before:97.85 After:97.85	Preventive + Required Project Global MR $7096.57 Before:96.33 After:98.98	Preventive $27.27 Before:97.85 After:97.85	Preventive $47.88 Before:96.33 After:96.33

South Alabama Regional Airport at Bell Benton Field (79J)

Branch & Section	2021	2022	2023	2024	2025	2026	2027
TB-01	Required Project Major Below Critical $227979.78 Before:45.09 After:100	Preventive $44.18 Before:98.98 After:98.98	Preventive $96.3 Before:97.85 After:97.85	Preventive + Required Project Global MR $26553.72 Before:96.33 After:98.98	Preventive $102.16 Before:97.85 After:97.85	Preventive $179.38 Before:96.33 After:96.33	Preventive $283.54 Before:94.36 After:94.36
TC01-01	StopGap $188.28 Before:55.65 After:55.65	Required Project Major Below Critical $0 Before:50.78 After:100	Preventive $8.49 Before:98.98 After:98.98	Preventive $18.5 Before:97.85 After:97.85	Preventive $32.49 Before:96.33 After:96.33	Preventive $51.52 Before:94.35 After:94.35	Preventive $75.16 Before:91.99 After:91.99
THANG01-01	StopGap $1078.98 Before:64.58 After:64.58	StopGap $1428.5 Before:60.18 After:60.18	StopGap $1802.08 Before:55.3 After:55.3	Required Project Major Below Critical $413613.16 Before:50.45 After:100	Preventive $80.2 Before:98.98 After:98.98	Preventive $174.79 Before:97.85 After:97.85	Preventive $306.9 Before:96.33 After:96.33
TL01-01	StopGap $17828.07 Before:13.54 After:13.54	StopGap $22118.84 Before:10 After:10	StopGap $93978.97 Before:6.46 After:6.46	StopGap $170544.74 Before:2.9 After:2.9	StopGap $237537.78 Before:0 After:0	StopGap $244663.91 Before:0 After:0	Required Project Major Below Critical $542779.4 Before:0 After:100

Appendix I2

Localized Maintenance Plan

South Alabama Regional Airport at Bell Benton Field (79J)

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	56	SWELLING	Low	399	SqFt	0.38	No Localized M & R	0		$0.00	$0
A01	01	Safety	48	L & T CR	Medium	3,056	Ft	2.94	No Localized M & R	0		$0.00	$0
A01	01	Safety	43	BLOCK CR	Low	10,373	SqFt	9.96	No Localized M & R	0		$0.00	$0
A01	01	Safety	42	BLEEDING	N/A	96	SqFt	0.09	No Localized M & R	0		$0.00	$0
A01	01	Safety	48	L & T CR	Low	4,149	Ft	3.99	No Localized M & R	0		$0.00	$0
A01	01	Safety	57	WEATHERING	Low	49,869	SqFt	47.9	No Localized M & R	0		$0.00	$0
A01	01	Safety	57	WEATHERING	Medium	49,869	SqFt	47.9	No Localized M & R	0		$0.00	$0
A01	01	Safety	43	BLOCK CR	Medium	3,990	SqFt	3.83	No Localized M & R	0		$0.00	$0
A01	02	Preventive	48	L & T CR	Low	18	Ft	0.01	No Localized M & R	0		$0.00	$0
A01	02	Preventive	48	L & T CR	Medium	115	Ft	0.07	Crack Sealing - AC	115	Ft	$3.95	$456
A01	02	Preventive	52	RAVELING	Low	67,647	SqFt	39.01	No Localized M & R	0		$0.00	$0
A01	03	Safety	43	BLOCK CR	High	3,321	SqFt	50	Crack Sealing - AC	1,012	Ft	$3.95	$3,998
A01	03	Safety	43	BLOCK CR	Medium	3,321	SqFt	50	No Localized M & R	0		$0.00	$0
A01	03	Safety	57	WEATHERING	High	3,321	SqFt	50	No Localized M & R	0		$0.00	$0
A01	03	Safety	52	RAVELING	Medium	3,321	SqFt	50	No Localized M & R	0		$0.00	$0
A01	04	Safety	52	RAVELING	High	1,084	SqFt	13.67	No Localized M & R	0		$0.00	$0
A01	04	Safety	52	RAVELING	Low	1,798	SqFt	22.67	No Localized M & R	0		$0.00	$0
A01	04	Safety	57	WEATHERING	Medium	5,049	SqFt	63.66	No Localized M & R	0		$0.00	$0
A01	04	Safety	43	BLOCK CR	Medium	7,931	SqFt	100	No Localized M & R	0		$0.00	$0
A01	05	Safety	57	WEATHERING	High	9,053	SqFt	50	No Localized M & R	0		$0.00	$0
A01	05	Safety	43	BLOCK CR	Medium	18,106	SqFt	100	No Localized M & R	0		$0.00	$0
A01	05	Safety	52	RAVELING	Medium	9,053	SqFt	50	No Localized M & R	0		$0.00	$0
A02	01	Preventive	48	L & T CR	Medium	450	Ft	0.38	Crack Sealing - AC	450	Ft	$3.95	$1,778
A02	01	Preventive	48	L & T CR	Low	100	Ft	0.09	No Localized M & R	0		$0.00	$0
A02	01	Preventive	56	SWELLING	Low	50	SqFt	0.04	Patching - AC Full-Depth	83	SqFt	$25.05	$2,066
A02	01	Preventive	57	WEATHERING	Low	117,693	SqFt	100	No Localized M & R	0		$0.00	$0
A03	01	Preventive	57	WEATHERING	Medium	12,113	SqFt	48.28	No Localized M & R	0		$0.00	$0
A03	01	Preventive	48	L & T CR	Low	38	Ft	0.15	No Localized M & R	0		$0.00	$0
A03	01	Preventive	57	WEATHERING	Low	12,115	SqFt	48.29	No Localized M & R	0		$0.00	$0

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A03	01	Preventive	48	L & T CR	Medium	535	Ft	2.13	Crack Sealing - AC	535	Ft	$3.95	$2,115
A03	01	Preventive	52	RAVELING	Low	859	SqFt	3.42	No Localized M & R	0		$0.00	$0
AHELO	01	Safety	48	L & T CR	Low	622	Ft	0.32	No Localized M & R	0		$0.00	$0
AHELO	01	Safety	48	L & T CR	Medium	13,044	Ft	6.81	No Localized M & R	0		$0.00	$0
AHELO	01	Safety	52	RAVELING	High	320	SqFt	0.17	No Localized M & R	0		$0.00	$0
AHELO	01	Safety	57	WEATHERING	Medium	95,590	SqFt	49.92	No Localized M & R	0		$0.00	$0
AHELO	01	Safety	52	RAVELING	Low	95,590	SqFt	49.92	No Localized M & R	0		$0.00	$0
AHELO	02	Safety	50	PATCHING	High	102	SqFt	0.25	Patching - AC Full-Depth	147	SqFt	$25.05	$3,684
AHELO	02	Safety	43	BLOCK CR	Medium	22,270	SqFt	54.65	No Localized M & R	0		$0.00	$0
AHELO	02	Safety	43	BLOCK CR	High	18,480	SqFt	45.35	Crack Sealing - AC	5,633	Ft	$3.95	$22,249
AHELO	02	Safety	57	WEATHERING	High	24,480	SqFt	60.07	No Localized M & R	0		$0.00	$0
AHELO	02	Safety	52	RAVELING	High	815	SqFt	2	No Localized M & R	0		$0.00	$0
AHELO	02	Safety	57	WEATHERING	Medium	15,352	SqFt	37.67	No Localized M & R	0		$0.00	$0
R1129	01	Safety	56	SWELLING	Low	4,545	SqFt	0.93	No Localized M & R	0		$0.00	$0
R1129	01	Safety	48	L & T CR	Medium	25,811	Ft	5.3	No Localized M & R	0		$0.00	$0
R1129	01	Safety	52	RAVELING	Low	55,518	SqFt	11.4	No Localized M & R	0		$0.00	$0
R1129	01	Safety	57	WEATHERING	Low	196,099	SqFt	40.27	No Localized M & R	0		$0.00	$0
R1129	01	Safety	48	L & T CR	Low	5,519	Ft	1.13	No Localized M & R	0		$0.00	$0
R1129	01	Safety	57	WEATHERING	Medium	235,383	SqFt	48.33	No Localized M & R	0		$0.00	$0
R1129	01	Safety	48	L & T CR	High	325	Ft	0.07	Crack Sealing - AC	325	Ft	$3.95	$1,282
R1129	01	Safety	45	DEPRESSION	Low	325	SqFt	0.07	No Localized M & R	0		$0.00	$0
R1129	02	Preventive	57	WEATHERING	Low	840	SqFt	4	No Localized M & R	0		$0.00	$0
R1129	03	Safety	52	RAVELING	Low	14,720	SqFt	1.6	No Localized M & R	0		$0.00	$0
R1129	03	Safety	48	L & T CR	Low	5,888	Ft	0.64	No Localized M & R	0		$0.00	$0
R1129	03	Safety	57	WEATHERING	Medium	268,640	SqFt	29.2	No Localized M & R	0		$0.00	$0
R1129	03	Safety	57	WEATHERING	Low	636,640	SqFt	69.2	No Localized M & R	0		$0.00	$0
R1129	03	Safety	48	L & T CR	Medium	27,600	Ft	3	No Localized M & R	0		$0.00	$0
TA	01	Safety	43	BLOCK CR	Low	7,779	SqFt	4.19	No Localized M & R	0		$0.00	$0
TA	01	Safety	52	RAVELING	Low	34,154	SqFt	18.41	No Localized M & R	0		$0.00	$0

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TA	01	Safety	48	L & T CR	Low	2,962	Ft	1.6	No Localized M & R	0		$0.00	$0
TA	01	Safety	57	WEATHERING	Low	75,668	SqFt	40.79	No Localized M & R	0		$0.00	$0
TA	01	Safety	43	BLOCK CR	Medium	3,380	SqFt	1.82	No Localized M & R	0		$0.00	$0
TA	01	Safety	48	L & T CR	Medium	13,208	Ft	7.12	No Localized M & R	0		$0.00	$0
TA	01	Safety	57	WEATHERING	Medium	75,668	SqFt	40.79	No Localized M & R	0		$0.00	$0
TA	02	Preventive	55	SLIPPAGE CR	N/A	375	SqFt	0.68	Patching - AC Full-Depth	457	SqFt	$25.05	$11,446
TA	02	Preventive	57	WEATHERING	Low	22,443	SqFt	40.76	No Localized M & R	0		$0.00	$0
TA	02	Preventive	48	L & T CR	Low	166	Ft	0.3	No Localized M & R	0		$0.00	$0
TA	02	Preventive	48	L & T CR	Medium	1,007	Ft	1.83	Crack Sealing - AC	1,007	Ft	$3.95	$3,977
TA1	01	Safety	57	WEATHERING	Low	9,640	SqFt	45.12	No Localized M & R	0		$0.00	$0
TA1	01	Safety	45	DEPRESSION	Low	115	SqFt	0.54	No Localized M & R	0		$0.00	$0
TA1	01	Safety	43	BLOCK CR	Low	214	SqFt	1	No Localized M & R	0		$0.00	$0
TA1	01	Safety	45	DEPRESSION	Medium	53	SqFt	0.25	No Localized M & R	0		$0.00	$0
TA1	01	Safety	48	L & T CR	Low	123	Ft	0.58	No Localized M & R	0		$0.00	$0
TA1	01	Safety	52	RAVELING	Low	2,084	SqFt	9.75	No Localized M & R	0		$0.00	$0
TA1	01	Safety	56	SWELLING	Medium	72	SqFt	0.34	No Localized M & R	0		0	$0
TA1	01	Safety	57	WEATHERING	Medium	9,640	SqFt	45.12	No Localized M & R	0		0	$0
TA1	01	Safety	48	L & T CR	Medium	1,210	Ft	5.67	No Localized M & R	0		0	$0
TA1	02	Safety	48	L & T CR	Medium	211	Ft	1.96	No Localized M & R	0		0	$0
TA1	02	Safety	57	WEATHERING	Low	5,025	SqFt	46.74	No Localized M & R	0		0	$0
TA1	02	Safety	48	L & T CR	Low	3	Ft	0.03	No Localized M & R	0		0	$0
TA1	02	Safety	52	RAVELING	Low	700	SqFt	6.51	No Localized M & R	0		0	$0
TA1	02	Safety	57	WEATHERING	Medium	5,025	SqFt	46.74	No Localized M & R	0		0	$0
TA2	01	Safety	43	BLOCK CR	Medium	1,785	SqFt	10.71	No Localized M & R	0		0	$0
TA2	01	Safety	43	BLOCK CR	Low	2,390	SqFt	14.34	No Localized M & R	0		0	$0
TA2	01	Safety	48	L & T CR	High	3	Ft	0.02	Crack Sealing - AC	3	Ft	3.95	$12
TA2	01	Safety	42	BLEEDING	N/A	72	SqFt	0.43	No Localized M & R	0		0	$0
TA2	01	Safety	56	SWELLING	Low	65	SqFt	0.39	No Localized M & R	0		0	$0
TA2	01	Safety	48	L & T CR	Medium	941	Ft	5.64	No Localized M & R	0		0	$0

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TA2	01	Safety	57	WEATHERING	Low	7,116	SqFt	42.69	No Localized M & R	0		0	$0
TA2	01	Safety	52	RAVELING	Low	2,364	SqFt	14.18	No Localized M & R	0		0	$0
TA2	01	Safety	57	WEATHERING	Medium	7,116	SqFt	42.69	No Localized M & R	0		0	$0
TA2	01	Safety	56	SWELLING	Medium	22	SqFt	0.13	No Localized M & R	0		0	$0
TA2	01	Safety	48	L & T CR	Low	471	Ft	2.83	No Localized M & R	0		0	$0
TA2	02	Safety	43	BLOCK CR	Medium	120	SqFt	1.94	No Localized M & R	0		0	$0
TA2	02	Safety	48	L & T CR	Medium	341	Ft	5.53	No Localized M & R	0		0	$0
TA2	02	Safety	45	DEPRESSION	Medium	10	SqFt	0.16	No Localized M & R	0		0	$0
TA2	02	Safety	57	WEATHERING	Low	3,016	SqFt	48.87	No Localized M & R	0		0	$0
TA2	02	Safety	48	L & T CR	Low	64	Ft	1.04	No Localized M & R	0		0	$0
TA2	02	Safety	45	DEPRESSION	Low	50	SqFt	0.81	No Localized M & R	0		0	$0
TA2	02	Safety	42	BLEEDING	N/A	138	SqFt	2.24	No Localized M & R	0		0	$0
TA2	02	Safety	57	WEATHERING	Medium	3,061	SqFt	49.6	No Localized M & R	0		0	$0
TA2	02	Safety	43	BLOCK CR	Low	436	SqFt	7.07	No Localized M & R	0		0	$0
TA3	01	Preventive	57	WEATHERING	Low	400	SqFt	5.22	No Localized M & R	0		0	$0
TA3	02	Safety	57	WEATHERING	Medium	4,426	SqFt	41.43	No Localized M & R	0		0	$0
TA3	02	Safety	48	L & T CR	Medium	187	Ft	1.75	No Localized M & R	0		0	$0
TA3	02	Safety	57	WEATHERING	Low	4,426	SqFt	41.43	No Localized M & R	0		0	$0
TA3	02	Safety	43	BLOCK CR	Medium	1,465	SqFt	13.71	No Localized M & R	0		0	$0
TA3	02	Safety	52	RAVELING	Low	1,832	SqFt	17.14	No Localized M & R	0		0	$0
TA3	02	Safety	43	BLOCK CR	Low	2,930	SqFt	27.43	No Localized M & R	0		0	$0
TB	01	Safety	48	L & T CR	Low	492	Ft	1.19	No Localized M & R	0		0	$0
TB	01	Safety	56	SWELLING	Low	589	SqFt	1.43	No Localized M & R	0		0	$0
TB	01	Safety	57	WEATHERING	Medium	18,828	SqFt	45.67	No Localized M & R	0		0	$0
TB	01	Safety	48	L & T CR	Medium	2,357	Ft	5.72	No Localized M & R	0		0	$0
TB	01	Safety	52	RAVELING	Low	3,569	SqFt	8.66	No Localized M & R	0		0	$0
TB	01	Safety	56	SWELLING	Medium	21	SqFt	0.05	No Localized M & R	0		0	$0
TB	01	Safety	57	WEATHERING	Low	18,828	SqFt	45.67	No Localized M & R	0		0	$0
TB	01	Safety	43	BLOCK CR	Low	246	SqFt	0.6	No Localized M & R	0		0	$0

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THANG01	01	Preventive	48	L & T CR	Medium	354	Ft	0.52	Crack Sealing - AC	354	Ft	3.95	$1,399
THANG01	01	Preventive	57	WEATHERING	Low	33,279	SqFt	48.6	No Localized M & R	0		0	$0
THANG01	01	Preventive	57	WEATHERING	Medium	33,279	SqFt	48.6	No Localized M & R	0		0	$0
THANG01	01	Preventive	45	DEPRESSION	Low	1,500	SqFt	2.19	Patching - AC Full-Depth	1,660	SqFt	25.05	$41,567
THANG01	01	Preventive	52	RAVELING	Low	1,161	SqFt	1.7	No Localized M & R	0		0	$0
THANG01	01	Preventive	48	L & T CR	Low	617	Ft	0.9	No Localized M & R	0		0	$0
TL01	01	Safety	43	BLOCK CR	High	6,906	SqFt	15.45	Crack Sealing - AC	2,105	Ft	3.95	$8,314
TL01	01	Safety	41	ALLIGATOR CR	High	106	SqFt	0.24	Patching - AC Full-Depth	152	SqFt	25.05	$3,807
TL01	01	Safety	45	DEPRESSION	High	852	SqFt	1.9	Patching - AC Full-Depth	973	SqFt	25.05	$24,372
TL01	01	Safety	57	WEATHERING	Medium	31,310	SqFt	70.03	No Localized M & R	0		0	$0
TL01	01	Safety	45	DEPRESSION	Medium	426	SqFt	0.95	No Localized M & R	0		0	$0
TL01	01	Safety	43	BLOCK CR	Medium	37,573	SqFt	84.04	No Localized M & R	0		0	$0
TL01	01	Safety	52	RAVELING	Medium	4,273	SqFt	9.56	No Localized M & R	0		0	$0
TL01	01	Safety	57	WEATHERING	High	8,790	SqFt	19.66	No Localized M & R	0		0	$0
TL01	01	Safety	50	PATCHING	Medium	124	SqFt	0.28	No Localized M & R	0		0	$0
TL01	01	Safety	52	RAVELING	High	213	SqFt	0.48	No Localized M & R	0		0	$0