applied pavement TECHNOLOGY

INDOT Airport Pavement Management System

INTERACTIVE APMS TOOL - IDEA

Presented by: Kyle Potvin, P.E.

Presentation Overview

- Public Law and Grant Assurance Requirements
- Airport Pavement Management System (APMS) Process
- Indiana's APMS
- Indiana's Interactive Data Exchange Application (IDEA)
- Questions

Public Law and Grant Assurance Requirements

- Public law 103-305 and Grant Assurance 11 has some minimum requirements for accepting federal money (NPIAS)
- Required for airports in the National Plan of Integrated Airport Systems (NPIAS)
  - Pavement Inventory
  - Pavement Inspections
    - Detailed
    - Drive-by
  - Record Keeping
  - Information Retrieval
  - Program Funding

Public Law and Grant Assurance Requirements

- Public law 103305 and Grant Assurance 11 has some minimum requirements for accepting federal money
- Required for airports in the National Plan of Integrated Airport Systems (NPIAS)
  - ~~Pavement Inventory~~
  - ~~Pavement Inspections~~
    - ~~Detailed~~
    - Drive-by
  - ~~Record Keeping~~
  - ~~Information Retrieval~~
  - Program Funding

APMS Process

- Systems Inventory
- Network Definition
- Condition Assessment
- Database Development
- System Customization
- Data Analysis
- Results
- Training and Outreach

APMS Process

- Systems Inventory
- Network Definition
- Condition Assessment
- Database Development
- System Customization
- Data Analysis
- Results
- Training and Outreach

APMS Process – Condition Assessment

- Assessed pavement conditions through visual inspection using the pavement condition index (PCI) procedure
- PCI is the most commonly used method for obtaining airport pavement conditions
- Involves identifying the type, severity, and extent of distress visible on the pavement surface
- Distresses observed give an indication of the underlying cause of deterioration
- Distress data are used to calculate an index, which ranges from 0 (failed) to 100 (new)
- The methodology is described in AC 150/5380-6C and ASTM Standard D5340

APMS Process– Condition Assessment

ASPHALT SURFACE DISTRESS TYPES

Distress Type	Severity Level	Recommended Maintenance Action
Alligator Cracking	Low	Monitor
	Medium	Full Depth AC Patch
	High	Full Depth AC Patch
Bleeding	N/A	Monitor
Block Cracking	Low	Monitor
	Medium	Crack Seal
	High	Crack Repair
Corrugation	Low	Monitor
	Medium	Partial Depth AC Patch
	High	Partial Depth AC Patch
Depression	Low	Monitor
	Medium	Monitor
	High	Partial Depth AC Patch
Jet Blast	N/A	Monitor
Joint Reflection Cracking	Low	Monitor
	Medium	Crack Seal
	High	Crack Surfacing/Repair
Longitudinal and Transverse Cracking	Low	Monitor
	Medium	Crack Seal
	High	Crack Repair

Distress Type	Severity Level	Recommended Maintenance Action
Oil Spillage	N/A	Partial Depth AC Patch
Patching	Low	Monitor
	Medium	Monitor
	High	Full Depth AC Patch
Polished Aggregate	N/A	Monitor
Raveling	Low	Monitor
	Medium	Resurfacing
	High	Resurfacing
Rutting	Low	Monitor
	Medium	Full Depth AC Patch
	High	Full Depth AC Patch
Shoving	Low	Monitor
	Medium	Partial Depth AC Patch
	High	Partial Depth AC Patch
Slippage Cracking	N/A	Full Depth AC Patch
Swelling	Low	Monitor
	Medium	Full Depth AC Patch
	High	Full Depth AC Patch
Weathering	Low	Monitor
	Medium	Surface Treatment
	High	Surface Treatment

APMS Process– Condition Assessment

ASPHALT SURFACE DISTRESS TYPES

L&T Cracking

Alligator Cracking

Raveling

APMS Process – Condition Assessment

PORTLAND CEMENT CONCRETE SURFACE DISTRESS TYPES

Distress Type	Severity Level	Maintenance Action	Distress Type	Severity Level	Maintenance Action
Blow-Up	Low	Full Depth PCC Patch	Popouts	N/A	Monitor
	Medium	Full Depth PCC Patch	Pumping	N/A	Monitor
	High	Slab Replacement	Scaling	Low	Monitor
Corner Break	Low	Monitor		Medium	Monitor
	Medium	Full Depth PCC Patch		High	Slab Resurfacing
	High	Full Depth PCC Patch	Settlement/Faulting	Low	Monitor
LTD Cracks	Low	Monitor		Medium	Grinding
	Medium	Crack Sealing - PCC		High	Slab Replacement
	High	Slab Replacement	Shattered Slab	Low	Monitor
Durability Cracking	Low	Monitor		Medium	Slab Replacement
	Medium	Full Depth PCC Patch		High	Slab Replacement
	High	Slab Replacement	Shrinkage Cracking	N/A	Monitor
Joint Seal Damage	Low	Monitor	Spalling (Joint and Corner)	Low	Monitor
	Medium	Joint Seal (PCC)		Medium	Partial Depth PCC Patch
	High	Joint Seal (PCC)		High	Partial Depth PCC Patch
Small Patching	Low	Monitor	Alkali-Silica Reactivity (ASR)	Low	Monitor
	Medium	Monitor		Medium	Partial Depth PCC Patch
	High	Partial Depth PCC Patch		High	Slab Replacement
Large Patching	Low	Monitor			
	Medium	Monitor			
	High	Full Depth PCC Patch			

APMS Process – Condition Assessment

PORTLAND CEMENT CONCRETE SURFACE DISTRESS TYPES

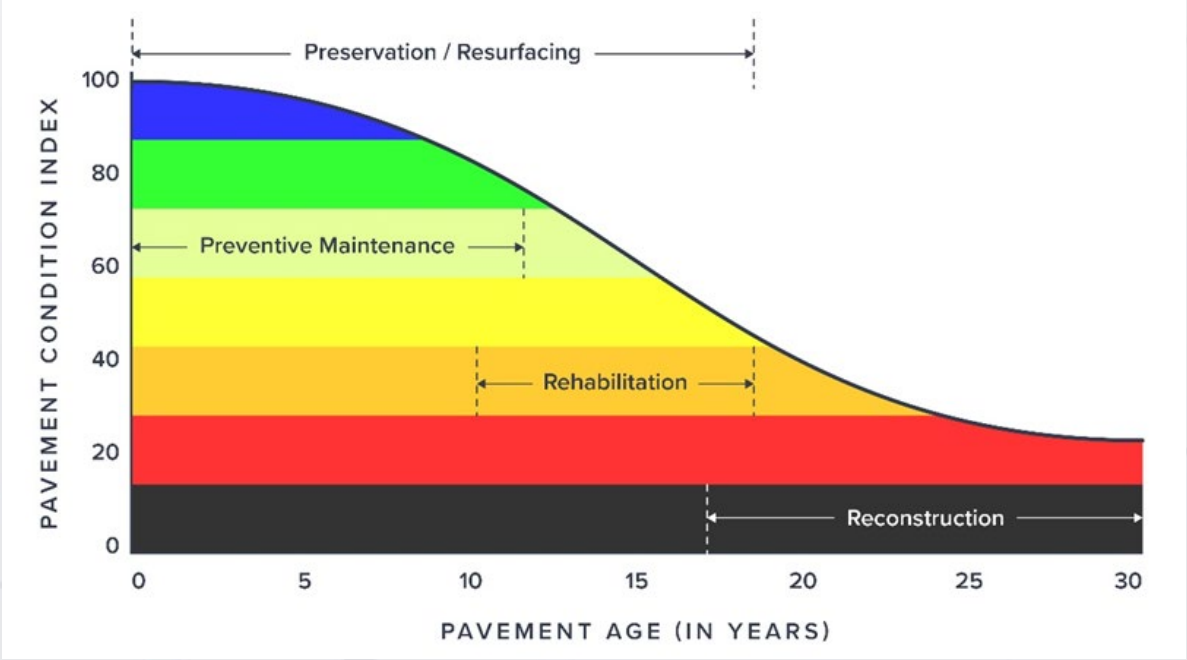
Spalling

LTD Cracking

Corner Break

APMS Process– Data Analysis

- Assess current and project future pavement condition throughout an airport or system of airports
- Develop plan to address immediate “reactionary” needs, preservation needs, and long-term rehabilitation needs



APMS Process– Data Analysis (continued)

- Analysis parameters for the Indiana system
  - Minimum condition thresholds (Critical PCIs) used

Pavement Use	Primary	Large GA >4500' Rwy	Small GA <4500' Rwy
Runway	70	60	55
Taxiway	60	55	50
Apron, or Less	55	50	50

  - Five (5) year analysis period
  - Inflation rate of 3 percent used for future costs
  - Unlimited funding is included in individual airport reports
  - Identifies a level of what is needed, when it is needed, and approximately how much it will cost

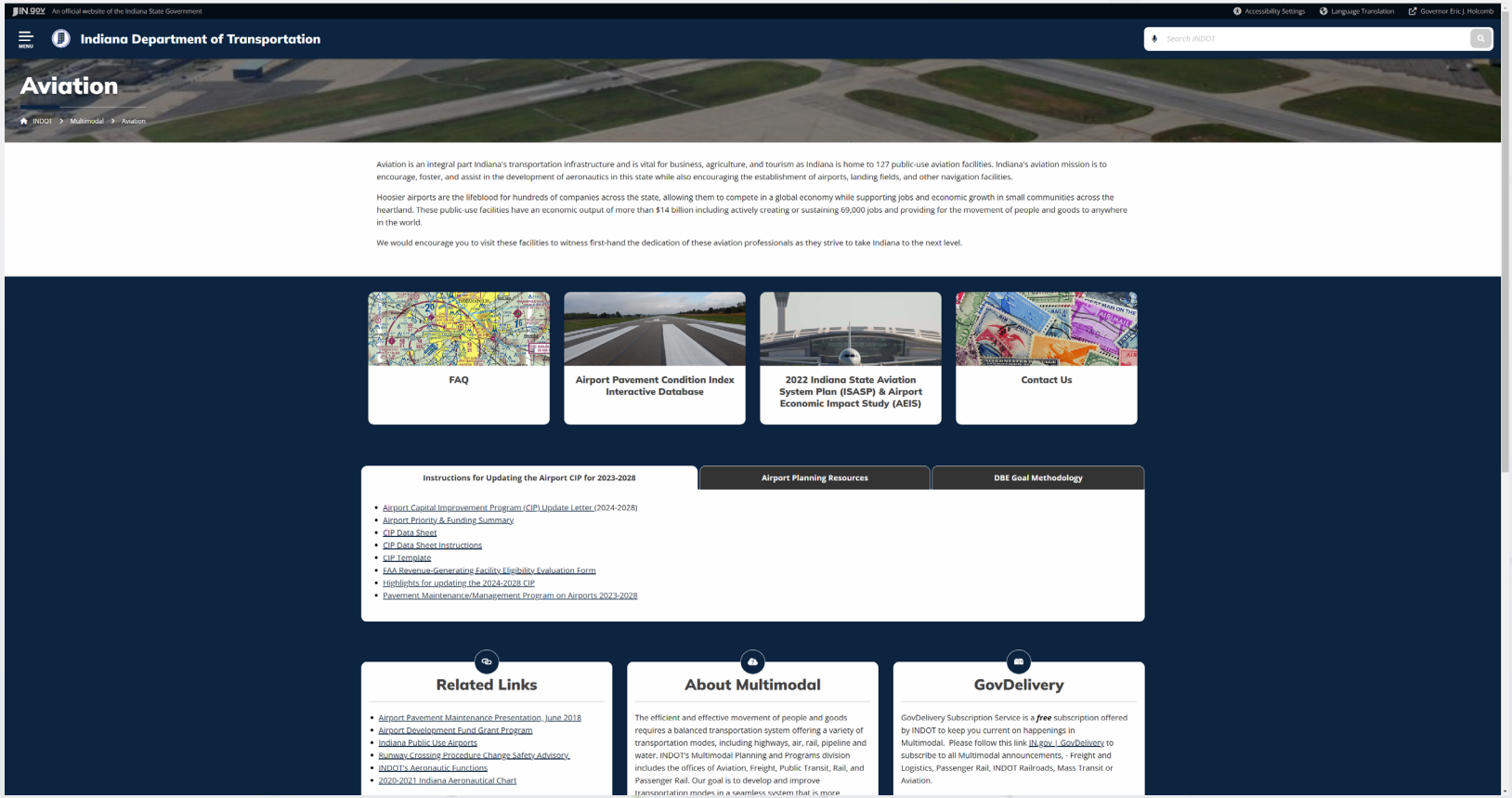
Indiana's APMS

- Dates back to the early 1990s
- Includes the inspection of 67 airports over a 3-year cycle
- A new 3-year update started Fall of 2022
- APTech is joined by CHA Consulting and CAD Vantage Inc
- Results are provided an interactive website
- Fulfills a majority of Grant Assurance 11 and Public Law 103 305 requirements for NPIAS airports

APMS Results - Overview

- Statewide Executive Summary
- Individual Airport Executive Summaries
- Interactive Project Results Website Includes:
  - Statewide Summarized Results
  - Individual Airport Results, including:
    - Pavement Inventory and Work History
    - PCI Results
    - Inspection Comments
    - Photographs
    - Condition and Needs Analysis

APMS Results – Interactive APMS Tool - IDEA



https://www.in.gov/indot/div/aviation/index.html

Additional Resources

- FAA Advisory Circular 150/5380-6C - Guidelines and Procedures for Maintenance of Airport Pavements.
- FAA Advisory Circular 150/5380-7B - Airport Pavement Management Program (PMP).
- ASTM - Subcommittee E17.42 Pavement Management and Data Needs (various standards including D5340 on PCI)
- Airport Cooperative Research Program (ACRP) http://www.trb.org/ACRP/ACRP.aspx

applied pavement TECHNOLOGY

Thank You

Questions?

applied pavement TECHNOLOGY

Thank You

Questions?