Outline

I. History of Airport Pavement Management
II. Collaboration with NASAO
III. Development Criteria
IV. PAVEAIR Development and Testing
V. Functionality
VI. Planned Future Work
VII. Live Demonstration
VIII. Questions
Definition

• **Pavement Management System (PMS)**

  “A system which involves the identification of optimum strategies at various management levels and maintains pavements at an adequate level of serviceability. These include, but are not limited to, systematic procedures for scheduling maintenance and rehabilitation activities based on optimization of benefits and minimization of costs.”

Definition

• **A tool to:**
  – Maintain an inventory of the pavement network
  – Monitor pavement condition
  – Identify pavement related needs
  – Prioritize pavement related work
  – Select most cost effective repair strategy both short and long term
  – State pavement related needs
History of Airport Pavement Management Systems (APMS)

• Development of Mainframe PAVER was started in 1968 for use on mainframe computers
• Development was by the United States Army Corps of Engineers (ACOE) for use by the Department of Defense (DOD)
• Development of MicroPAVER was started in 1985 for use on microcomputers
• Funding was provided by the FAA and development by the ACOE

History of Airport Pavement Management Systems (APMS)

• Delivered in 1987, the FAA version of MicroPAVER had the following functions:
  – Divide airport pavements into uniform sections
  – Store the pavement condition history in accordance with the Pavement Condition Index (PCI) method
  – Store pavement construction and maintenance history
  – Store deflectometer test results for overlay design
  – Generate network level reports for planning, budgeting, inspection scheduling, and pavement condition at any time
  – Provide project level analysis for maintenance and repair (M&R) requirements and perform economic analyses for different M&R alternatives
AC 150/5380-7A Recommends an Airport PMS Software

When developing an APMS, airports can make use of several existing software options. MicroPaver™ is a pavement management system (PMS) application being used by airport pavement networks at the state and local level. The U.S. Army Construction Engineering Research Laboratory and the Federal Aviation Administration (FAA) have been collaborating on developing a pavement management system to aid airports in managing their pavement networks. The system is intended to help airports optimize their pavement maintenance and rehabilitation needs, as well as provide a means for sharing information to optimize the expenditure of funds.

An Internet (Web) based system was deemed to be the best option considering the mature status of web-based applications.

The FAA also has a need for system-wide dissemination and analysis of the performance of FAA sponsored pavement projects.

Collaboration with NASAO

- In 2003, a joint initiative was agreed upon between the FAA and the National Association of State Aviation Officials (NASAO) to develop a system for sharing information to optimize the expenditure of funds.

- An Internet (Web) based system was deemed to be the best option considering the mature status of web-based applications.

- The FAA also has a need for system-wide dissemination and analysis of the performance of FAA sponsored pavement projects.
Development Criteria

• In accordance with Appendix A of Advisory Circular AC 150/5380-6 an APMS should include:
  – Pavement Inventory
  – Fixed Inspection Schedule
  – Record Keeping
  – Information Retrieval
  – Program Funding

Development Criteria

• Web-based application that provides a system for easy dissemination of information
• Data for multiple airports available on a single server connected to the web
• Suitable for installation and use on:
  – Single PC
  – Private network
  – Intranet or Internet
Development Criteria

• Make the complete application available for free download:
  – As a set of installation files
  – Full source code
  – Documentation for installation and operation

• A server is installed at the WJHTC to be a repository for civil airport projects funded under the Airport Improvement Program (AIP)

Development Criteria

• FAA Compliance Requirements
  – Web standards
  – Branding
  – Web templates
  – Web security standards
  – Section 508 accessibility
  – Registration with the FAA IT organization
History of Development and Testing

FAA PAVEAIR Development -
- In May 2008, Development Delivery Order for PAVEAIR awarded to SRA International
- Testing Delivery Order for PAVEAIR awarded to SRA in June 2009
- With the exception of two complex modules, Maintenance & Repair (M & R) and Mapping, development was finished in June 2009

FAA PAVEAIR Testing -
- Alpha testing of PAVEAIR began in November 2009 and concluded in January 2010
- Beta testing began in February 2010 and concluded in April 2010
- Alpha and Beta testing conducted by three third party organizations
- Total number of bugs identified were 150. All have been resolved and tested
History of Development and Testing

Current PAVEAIR Status
• Development complete

• Internal and external testing continues

• Some issues remain to be discussed with FAA HQ

• Proposed FAA PAVEAIR release date is pending

FAA PAVEAIR Functionality

• PAVEAIR has the same functionality of MicroPAVER version 5.3

• Primary FAA PAVEAIR functionalities
  – Inventory
  – Work
  – Pavement Condition Index (PCI)
  – Standard Reports
  – Prediction Modeling
  – Condition Analysis
  – Maintenance & Rehabilitation (M&R) Plan
FAA PAVEAIR Functionality

• Additional FAA PAVEAIR Functionalities
  – Import of MicroPAVER databases
  – Export of PAVEAIR databases to XML
  – Security control
  – User and profile management

• Possible Implementations
  – By the FAA for AIP projects
  – By States’ Department of Aviation for GA airports (NASAO interest)
  – By consulting and engineering services companies for private or customer only access
FAA PAVEAIR

- **Architecture**
  - Client Layer
    - Web Browser
  - Application Layer
    - User Interface, Business Rules, Data Access
  - Database Layer
    - Disk Drive(s)

- **Database Architecture**
  - System Databases
    - ASP.NETDB
    - PDMSStatic
  - Import Databases
    - PDMSPaverImport
    - PaverToPDMS
  - User Databases
    - User Data
    - User Data
FAA PAVEAIR

- **ASPNETBD Database**
  - Created by the Microsoft ASP.NET Logon Control
  - Authentication and authorization
  - Stores user information, session variables, session states, etc.
  - Provides
    - Logon control,
    - Creates User Wizard
    - Password controls

- **PDMSStatic Database**
  - Stores top level configuration data.
  - PCI categories, colors, pavement roughness categories, etc.

FAA PAVEAIR

- **Import Databases**
  - Compatible with MicroPAVER.
    - Able to import Micro Paver e60 file.
    - Able to import Micro Paver MDB file.
  - Import Steps:
    - Data is uploaded into PaveSPaverImport.
    - Data is converted and temporarily stored in PaverToPDMS.
    - Data is then copied to a new PAVEAIR database.
FAA PAVEAIR Menus

1. Home  
2. Inventory  
3. Work  
4. PCI  
5. Prediction Modeling  
6. Condition Analysis  
7. M&R  
8. Reports  
9. Maps  
10. Tools  
11. Login  
12. Member Area  
13. About  
14. Help

Home Page – http://FAAPAVEAIR.FAA.GOV

Welcome to PAVEAIR

PAVEAIR is a public, web-based application designed to assist organizations in the evaluation, management, and maintenance of their pavement networks. PAVEAIR is designed to fulfill the requirements of an Airport Pavement Management System as identified in Advisory Circular (AC) 150.5380-7A.

PAVEAIR is a pavement management system intended for use by airport pavement engineers, airport management, cost accounting professionals charged with determining the most accurate PCI as a basis for maintaining the safest possible airport pavement quality within acceptable cost constraints and time horizons.

Public Databases

These databases are available for public (read only) access.

JFK

ALDATA
Registration

Various user security and access rights

Executive summary/review
Administrator (establish rights)
Data input (owner), etc.

User Profile Screen /Member

User Profile and Data Management Page

- Update Profile
- Change Password
- Create Database
- Inventory Update
- Work Update
- Update Inspection
- Upload Shape Files to Current DB
Inventory Screen

Federal Aviation Administration
FAA PAVEAIR
December 8, 2010

Network: Aughlaize County
Branch: 8-26
Section: A

Primary Runway area includes turn-a-round buttons (32,400 s.f.).
Runway end 08, 4,000 ft. down R/W 26.

Work Screen

Federal Aviation Administration
FAA PAVEAIR
December 8, 2010

Network: Aughlaize County
Branch: 8-26
Section: A

Primary Runway area includes turn-a-round buttons (32,400 s.f.).
Runway end 08, 4,000 ft. down R/W 26.

Work History: 9
Date: 5/27/1986
Phase: Overlay - AC Structural
Type: OL-AS
Quantity: 400000.00
Cost: $50000
Thickness: 1.25
Thickness Unit: in
Comment: 000 004
Major HR: 0
Work Completed: 0
### Condition Analysis

**Federal Aviation Administration**

**FAA PAVEAIR**

**December 8, 2010**

#### Network Analysis

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### M&R Planning

**Federal Aviation Administration**

**FAA PAVEAIR**

**December 8, 2010**

#### M&R Planning Interface

- **Inventory**
  - Select Item
  - Inventory
  - 1: Terminal 4-JFK
    - APRON
    - APRON (APR-001)
    - APRON (APR-002)
  - ... (additional entries)

- **New M&R Plan**
  - New Plan Name
  - Database
  - Allow Public Access

- **Existing M&R Plan**
  - Existing Plan Name
  - Database
  - ... (additional entries)
Tools Menu

English / Metric Unit Preferences
Current Display Unit: Metric

Export Current Database to XML

About Screen

Version: RC 1.0.7 build 2010.11.08

About

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PAVEAIR is a pavement management system intended for use by airport pavement engineers, airport management, cost accounting professionals charged with determining the most accurate PCI as a basis for maintaining the safest possible airport pavement quality within acceptable cost constraints and time horizons.

For questions, comments, or further information concerning this program, please contact Albert Larkin FAA Airport Technology R&D Branch, AIP-6312

Additional Information

Please visit the National Airport Pavement Test Facility to learn more about us and our programs.
Future FAA PAVEAIR Work

• Track and correct bug fixes after release

• Evaluate the feasibility of upgrading FAA PAVEAIR to comply with the FAA Airport Geographical Information System (AGIS)

• Create a lesson plan for FAA PAVEAIR workshops

• Conduct User’s Group meetings to improve the application

• Develop procedures for disaster recovery and continuity of operations plans in the event normal operations are interrupted
Future FAA PAVEAIR Work

- Develop an User Interface to manage users and profiles
- Improve the Maintenance and Repair plan
- Evaluate automated Pavement Condition Index feasibility using FAA PAVEAIR
- Continued support and development after initial deployment
- Provide a Spanish and French language version

Integration of PAVEAIR