Enhancement of GDOT’s Pavement Rehabilitation and Design Processes by Integrating New and Existing Data Sources and Developing Data Analysis and Reporting Procedures

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Abstract

Pavement rehabilitation and design is a data-driven decision making process. To make an informed decision, pavement evaluation data collected by the Pavement Design Branch (PDB) of the Office of Materials and Testing is essential for understanding in-service pavement structures and conditions. Historical pavement condition data is also needed for better understanding of the in-place pavement performance. Though a wealth of information exists in the form of historical COPACES data and pavement coring data from various offices, there is no centralized database and efficient tool for PDB and other offices to access and analyze these data. Current methods for manual data retrieval and analysis are extremely time-consuming and make it difficult to support the data-driven decision making.

This research project aims at solving the above issues by developing a complete IT-based solution that consists of a GPS-based handheld for field data collection and a GIS-based web platform that integrates pavement data from various data sources.

Objective

This project is to develop the following applications:

- a GPS-based handheld for field data collection using the developed PavE-Field program
- a Wi-Fi camera for capturing field pictures that are automatically integrated with handheld-collected data
- a seamless data transfer, management, and uploading procedure using the PavE-Office program
- a GIS-based web platform, Pavement Evaluation Application (PEA)

To integrate pavement evaluation data with other data sources such as various GDOT map services and online map services

To provide functions for searching, visualizing, and reporting pavement evaluation data

To enable other offices and contractors to share their pavement coring data

To provide functions to extract the historical pavement PACES ratings for a programmed project and estimate the remaining service life using various interactive tools.

Implementation Status

- The GPS-based handheld application has been successfully implemented and used for field data collection since 2008 for more than 80 projects. About 4,000 digital images were collected and integrated with the pavement evaluation data.

- Currently, the first test version of PEA web application has been deployed to GDOT’s product testing server. And, the pavement design engineers and other end users are conducting comprehensive testing.

Potential End Users

- Office of Maintenance
- Contractors & Consultants
- District & Area Offices
- Office of Roadway Design