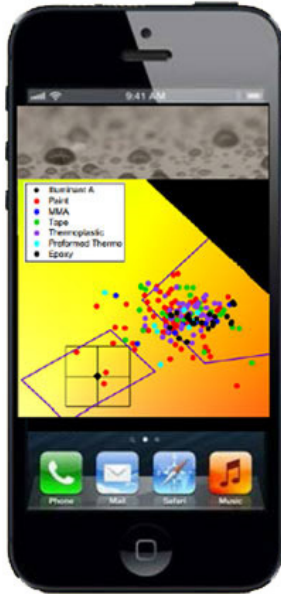




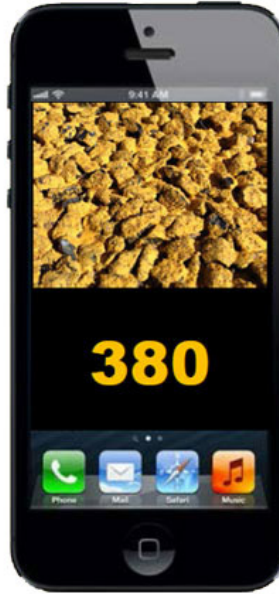
Pavement Marking Presence Tool



Coverage Area



Color Quality



Reflectivity

Mockups of the mobile application the Tech Center is developing illustrate the three areas of analysis for airport pavement paint. (Images: PEGASAS)

In The Paint: Tech Center Developing App to Help with Runway Incursions

The FAA inspectors who gauge the quality of runway and taxiway paint may soon have technology to help them approach the task more analytically. The William J. Hughes Technical Center, which is part of the NextGen organization, is working with two universities to develop a mobile application for the inspections.

“The goal is to stop runway incursions,” said Project Manager Holly Cyrus, noting that curtailing such incursions is on the ATO’s **Top 5** list of safety hazards in the national airspace system. “It’s critical that they be able to see the markings so they can stop.”

A mechanical engineer in the Tech Center’s Airport Safety Research and Development Section, Cyrus is the FAA’s technical monitor for research into the Pavement **Marking Presence Tool**. Iowa State and Texas A&M universities are developing the app through the FAA’s (**Center of Excellence** for) Partnership to Enhance General Aviation Safety, Accessibility and Sustainability, or **PEGASAS**.

For years the Tech Center has been researching ways to improve the analysis of paint markings at the nation’s airports. A previous **study** authored by Cyrus examined various manual and automated tools that inspectors could use to make the process less subjective.

While the study found that “the many variables in a subjective technique for evaluating markings can lead to a lack of confidence in the validity of the evaluation,” the solutions to address that concern were not ideal. One approach would have required inspectors to carry three devices to determine the reflectivity, color quality and coverage area of paint markings.

“That would require the inspector to have a truckload of equipment,” said Jim Patterson, manager of the Airport Safety R&D Section. “... We needed a solution that they could all carry.”

The three pieces of equipment also would have been costly -- \$20,000 per machine just for the tool to gauge reflectivity.

The idea for an app, which would overcome both of those obstacles, emerged through PEGASAS in early 2014. Last fall, after identifying transportation research centers with the required expertise in both mobile app development and digital imagery, the FAA approved grants to move forward with the project.



Workers install paint markings on the FAA ramp of Atlantic City International Airport. (Photo: FAA)

Patterson said the researchers at Iowa State and Texas A&M have been working to overcome various challenges. A mobile app “sounds like a very simple concept,” he said, “but there are some complexities to it we’re trying to work out.”

One challenge involves the geometry for analyzing paint reflectivity. The FAA uses the standard 30-meter observation distance for highway paint markings, which represents what a driver in an average-height vehicle would see during bad weather at night.

“We have to duplicate the scientific measurement,” Patterson said, and that requires not only incorporating the geometric standard into various mobile devices but also understanding the geometry of the devices. The app must account for the distance between each device’s built-in flash and lens in order to calculate the intensity of the flash.

The app also must be built with other mobile camera differences in mind, including resolution and focal length. And inspectors will have to be trained to hold the cameras at certain angles and distances from the paint to get accurate readings for technological analysis.

To determine the coverage area of paint markings, inspectors will take multiple photos at each airport, and

the app will average the readings. “We wouldn’t want to fail an airport for one tiny spot,” Patterson said.

The FAA hopes to have a prototype in the hands of select inspectors for field tests by the end of September. The app likely will be deployed in every airport inspection region, but the locations have not yet been chosen. “It’s very conceivable that we could deploy it to all of the inspectors” because of the limited costs, Patterson said.

Down the road, the FAA also might offer the app to airport authorities that get money through the Airport Improvement Program. “This could be used as self-enforcement to make sure they’re in compliance with paint markings,” Patterson said.

About Us

The Airport Technology Research and Development Branch supports the FAA’s mission by conducting the necessary research and development required to enhance the safety of operations at our nation’s airports and to ensure the adequacy of engineering specifications and standards in all areas of the airport systems and, where necessary, develop data to support new standards.

With the implementation of new procedures from the NextGen research, the role of airports will be to accommodate the increased traffic safely. This is especially critical during aircraft operations in inclement weather. The increased traffic will necessitate efficient inspection and maintenance of our runways and taxiways. This will require development of technologies to heat airport pavements, reliable methods to assess the braking performance of aircraft, development of lighting and marking materials providing higher visibility, development of new lighting technologies, such as, holograms, developing methods to mitigate wildlife at or near the airport, and developing new and efficient techniques for aircraft rescue and fire fighting.

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