ACRP Problem Statement 17-09-04

Recommended Allocation: $250,000

Collection of Pavement Condition Data According to ASTM D5340 and Use of the Pavement Condition Index Procedure In Airport Decisions

ACRP Staff Comments

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TRB Aviation Committee Comments

AIRCRAFT/AIRPORT COMPATIBILITY: The research could be useful, but no methodology is proposed, no payoff is offered, and no cost is proposed. More information is needed.

Review Panel Recommendation and Comments

Recommended. The proposed research would help both small and large airports be more informed.

AOC Disposition

This problem statement received an average rating of 2.9 points out of a possible 5 points among voting AOC members. The proposed research might be a good pavement-related study to be led by ACRP, as it focuses on PCI and visual inspections and would complement related FAA research. Approved and funded at $250,000 as ACRP Project 09-17.
PROPOSED ACRP SYNTHESIS: COLLECTION OF PAVEMENT CONDITION DATA ACCORDING TO ASTM D5340 AND USE OF THE PAVEMENT CONDITION INDEX PROCEDURE IN AIRPORT DECISIONS

David Peshkin, P.E.
Applied Pavement Technology, Inc.

As noted in ASTM D5340, Standard Test Method for Airport Pavement Condition Index Surveys, “this test method covers the determination of airport pavement condition through visual surveys.” The method was first developed in the 1970s by the U.S. Army Corps of Engineers and has been modified many times since then to incorporate new knowledge and understanding of pavements and their performance.

The distresses that are described in the ASTM method and the Pavement Condition Index (PCI) that is calculated from their proper measurement and recording are used in a broad range of applications, including network-level pavement evaluation for managing pavements, project-level pavement evaluation for rehabilitation design, and determination of maintenance and repair quantities. Related to these and other applications, the PCI is referenced in at least four important FAA Advisory Circulars (AC): 150/5380-7B, Airport Pavement Management Program (PMP); 150/5320-17A, Airfield Pavement Surface Evaluation and Rating Manuals; 150/5320-6E, Airport Pavement Design and Evaluation; and 150/5380-6C, Guidelines and Procedures for Maintaining Airport Pavements.

There are many issues of interest related to the collection of pavement condition data and the reporting of a PCI, including the following:

- The process can be time-consuming and, as such, expensive.
- At certain airports, operations may limit the time available to collect condition data.
- The defined distresses do not universally cover conditions or performance measures of interest, such as construction-related segregation or longitudinal profile.

Furthermore, automated distress data collection equipment are increasingly being used on airport pavements, and it is observed that these devices do not currently capture all of the distresses associated with a comprehensive assessment of a pavement, nor is it completely possible to resolve the distresses collected by all automated methodologies into severity levels according to the ASTM method. Nonetheless, automated data collection continues to be promoted, especially where access by crews on foot is constrained by time or safety.

The purpose of this synthesis is to document the state-of-the-practice of the collection of pavement condition data and how such data are used. This includes the methodologies that are used to evaluate pavements to include both procedures and equipment, how frequently evaluations are performed, the challenges encountered in applying ASTM D5340 or other pavement rating procedures, and what decisions are driven by visible condition data and what
decisions require other information. The sources of information for the synthesis include airport operators and their engineers, engineering consultants, contractors, and the FAA.

With the recent changes in distress definitions by ASTM and the growing use of automated data collection equipment, an assessment of current practices would be of interest to most airports and engineers, and help to identify whether the PCI procedure is continuing to serve the needs of its users.