



McHenry County

Division of Transportation

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MCDOT Implements Innovative Computerized Pavement Management System

WOODSTOCK - The McHenry County Division of Transportation (MCDOT) has recently implemented an innovative computerized pavement management system. This system allows the MCDOT to make well informed decisions when committing public funds to potential roadway rehabilitation projects. Although the MCDOT's pavement preservation program has been in effect for some time, the use of a computerized system is a relatively new development within the program. In fact, the MCDOT is among a handful of County transportation agencies within Illinois committed to such an approach.

Beginning over a decade ago, the MCDOT's ambitious goal was to resurface each roadway once every ten years. However, as most within the transportation industry are aware, construction costs and, specifically, the cost of asphalt rose dramatically in the early 2000's. Given current and foreseeable future funding, the MCDOT realized that roadway resurfacing at this frequency would not be attainable. A new approach would be necessary to effectively maintain the County highway system given the funding available to the MCDOT.

In response to the rising costs, the MCDOT initiated its pavement preservation program in 2006. The goal of the program is to extend the useful life of County pavements in order to offset the prohibitive cost of roadway reconstruction. Essentially, the program maintains pavements in good condition for longer periods of time through the application of lower cost rehabilitation alternatives. To that end, techniques such as crack sealing and micro-surfacing are used to extend the interval between conventional resurfacing and, ultimately, the need for complete roadway reconstruction.

To facilitate the MCDOT's program, a large amount of data covering the highway network would need to be generated. To accomplish this data collection, the MCDOT hired Applied Research Associates, as a subconsultant to Baxter and Woodman, for assistance. Applied Research Associates employed the use of a digital survey vehicle equipped with onboard computers, multiple directional cameras and Global Positioning System (GPS) equipment. The vehicle was used to capture roadway images and collect pavement distress information throughout the nearly 500 lane miles that comprise the County highway network.

Once the field survey was complete, the County highway network was divided into 124 logical pavement management segments. Quantitative measures for pavement distress, roughness and rutting were determined for each segment using the Condition Rating System (CRS) methodology. This methodology, originally developed by the Illinois Department of Transportation, is applicable to a variety of road types ranging from major expressways to county highways and has been used successfully by highway agencies for many years. However, unique to this project was the integration of the CRS data with the MCDOT's Geographic Information System (GIS). A GIS is a computerized system that stores, analyzes, and presents data associated with a specific location. The GIS mapping of the CRS data allows a quick visual representation of the condition of County roadways.

The above CRS rating values, along with daily traffic data and budgetary information, were then imported into the MCDOT pavement management system for further analysis. The computer system uses the above data in combination with a pavement deterioration model and rehabilitation decision matrix. Based on this information, the system identifies segments recommended for rehabilitation, the type of rehabilitation to be used and the appropriate timing for such rehabilitation.

Preliminary rehabilitation scenarios performed by MCDOT personnel have shown the system's performance to be favorable. However, it is important to note, the system's recommendations are not the sole factor used to determine which projects to complete. Rather, recommended projects are further evaluated by MCDOT engineers to arrive at final project selection. In this manner, the pavement management system is used as a tool that aids the expertise and experience of MCDOT engineers.

For the future, the MCDOT is considering the possibility of pavement deflection testing for inclusion in the next pavement distress survey, tentatively scheduled for 2011. Such testing would identify structural weaknesses underlying the roadway surface that could lead to premature pavement deterioration. This information would be used in conjunction with the surface distress to arrive at the most appropriate rehabilitation method for each pavement management segment. Again, this data would be incorporated in to the MCDOT's GIS.

In conclusion, as the pavement management system is refined over time, the MCDOT envisions the system will assume an increasingly important role within the Division's pavement preservation program. Nonetheless, in its current state, the system represents an invaluable tool to identify necessary rehabilitation projects and to better utilize public transportation funds.

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