

Michigan Department of Transportation **Demonstration Project Evaluation Process**

Michigan's Public Act 457 of 2016 states in part, "The department shall measure the interim success of each demonstration project each year..." and the department needs to assess "...the cost-effectiveness and performance of the pavement materials and design used in the project and compare the results to the pavement material identified under the department's standard pavement selection process" after its demonstration life. These requirements are for projects built under the Michigan Department of Transportation's (MDOT) Pavement Demonstration Program. If the demonstration project is determined to be performing satisfactorily and is cost-effective, the applicable demonstration characteristics will be considered for inclusion as a standard practice in MDOT projects.

Qualitative engineering assessment and quantitative performance modeling analyses will be utilized to interpret the information collected for each demonstration project. This information is used to evaluate and determine if the demonstration characteristics will be included in MDOT standard procedures. Each project is unique and site characteristics fluctuate, so the process is variable and involves an amount of subjectivity. However, general guidelines can be developed to assist in the determination of applicability to standard practice.

The decision to make a new/experimental pavement fix standard practice cannot typically be made within a few years of construction, as the service life of most pavement sections is greater than twenty-five years. MDOT uses Distress Index (DI) to measure pavement performance. Distress information for each pavement section on MDOT's network is collected over a two-year cycle and used to calculate the DI. The model MDOT uses to predict future performance requires an inflection point in the data to appropriately predict the life of the pavement. The inflection point signifies an increase in the rate of progression of distresses. A minimum of three data points is also needed to use MDOT's model to predict future performance. Generally speaking, a pavement section must be at least six years old and have an inflection point in the year-to-year DI data in order to have a reasonable prediction of expected service life. Unrealistic life expectancy predictions are generated in the absence of the inflection point. However, in some cases, the lack of an inflection point may be an indicator of a good performer if the DI values are very low and it has lasted more than half its design life. In these cases, consideration for making it a standard may be warranted.

The Pavement Design Program Engineer in the Construction Field Services Division oversees the Pavement Demonstration Program and manages the following process:

1. Each demonstration project is visited on an annual basis to conduct a visual evaluation of its condition. Depending on the condition and/or age, testing may be conducted to determine other properties or conditions, or to investigate anything discovered during the visual evaluation.
2. The general condition of each project is summarized in an annual report provided to the Michigan legislature per Public Act 457.
3. All project information is reviewed for projects that have been in place for at least six years and have a minimum of three DI data points. This review will determine if the demonstration project is ready to have an official recommendation to standardize or reject the demonstration characteristic. The decision may be based on, but not limited to the following:
 - a. Reasonably predicted service life from the modeling of the DI data.

- b. Measurement and evaluation of pavement ride quality.
 - c. If there is no inflection point in the plotted DI data (i.e. unreasonably long life), and the pavement has reached at least half of its design life, indicating very good performance.
 - d. Low predicted life from the modeling of the DI data or other indicators of poor performance.
 - e. Comparison of project performance information (including any of the above), initial costs, maintenance costs, and cost/benefit with an identified comparable standard fix.
 - f. End of life of demonstration project due to reconstruction or rehabilitation of existing pavement.
4. If it is agreed upon that it is too early to determine that the demonstration pavement fix should become standard, then this process ends for that project until the next annual evaluation.
5. For projects that are determined to be ready for a recommendation (either standardize or reject), a summary of the analysis and recommendations will be prepared and provided to appropriate MDOT personnel for review and feedback. The summary should include a plan for implementation if the recommendation is to move the demonstration pavement fix to standard practice.
6. After MDOT's review and if it is decided to continue forward with the recommendation, a summary will be provided to the paving industry associations for their review and feedback.
7. Industry feedback will be reviewed, and all documentation will be submitted to MDOT's Engineering Operations Committee (EOC) for review and approval of the recommendation. If MDOT decides not to pursue the recommendation based on industry feedback, the process ends for that project until the next annual evaluation.
8. The implementation plan will begin if EOC approval is provided. If EOC concurs with a recommendation for rejection of the demonstration pavement fix, the project will end as a demonstration project. If the EOC does not concur with the recommendation, then the process ends for that project until the next annual evaluation.
9. A final report, per Public Act 457 of 2016, will be prepared for each project.

Figure 1: Demonstration Project Evaluation Process Flow Chart

