

## 5-6610-01: Implementation of Defect Correction Assessment Methodology on TxDOT Ride Quality Projects

### Background

The Texas Department of Transportation (TxDOT) implements the Item 585 ride specification for quality assurance testing of initial ride quality. Item 585 includes a provision to locate defects on the final surface based on inertial profile measurements. To identify the defects, Item 585's methodology checks the deviations between the average profile and its 25-ft moving average. Stations where the deviations exceed 150 mils are considered defect locations. Some districts have taken the additional step of using a bump rating panel to identify the bumps and dips to be corrected based on the panel's opinion of defect severity from a ride quality point of view. For ride quality assurance testing consistency, TxDOT project 0-6610 developed a defect correction index (DCI) based on correlating defect characteristics to the need for corrections using data from bump rating panel surveys. The current project follows up on this original development by conducting the initial implementation of the DCI methodology from the previous project.

### What the Researchers Did

In implementing the DCI methodology, researchers conducted additional bump rating panel surveys to verify the original DCI equation developed from project 0-6610. This verification led researchers to re-calibrate the original equation using the expanded bump rating panel database compiled in this project. Researchers used the calibrated DCI equation in modifying the Grind Diagnostics program to automate the application of the DCI methodology. Researchers also conducted three training classes to introduce TxDOT engineers to this software for evaluating defect corrections on Item 585 projects or treatments for an existing roadway during the project development and planning process to improve ride quality.

### What They Found

Researchers found a more robust equation from calibrating the original DCI model using the expanded bump rating panel database. Researchers also realized a suitable platform for implementing the DCI methodology from modifications made to Grind Diagnostics, which include a utility to estimate costs of alternative corrective actions (Figure 1) and graphical output to communicate DCI analysis results in practice (Figure 2). The program received highly positive feedback from the training classes conducted during the project.

### What This Means

Project 5-6610-01 completed the initial implementation of the DCI methodology for evaluating defect corrections to improve ride quality. Researchers strongly recommend a follow-up project to provide for software improvements identified from the training classes and to continue the implementation effort. The next stage of this implementation should include demonstration projects where the researchers work with area engineers on actual construction and development projects. The experience from this collaborative engagement will further identify specific program changes to better tailor the program to the applications for which it is used. This experience will also provide better examples to go over program applications in additional training courses to be conducted in the recommended follow-up project.

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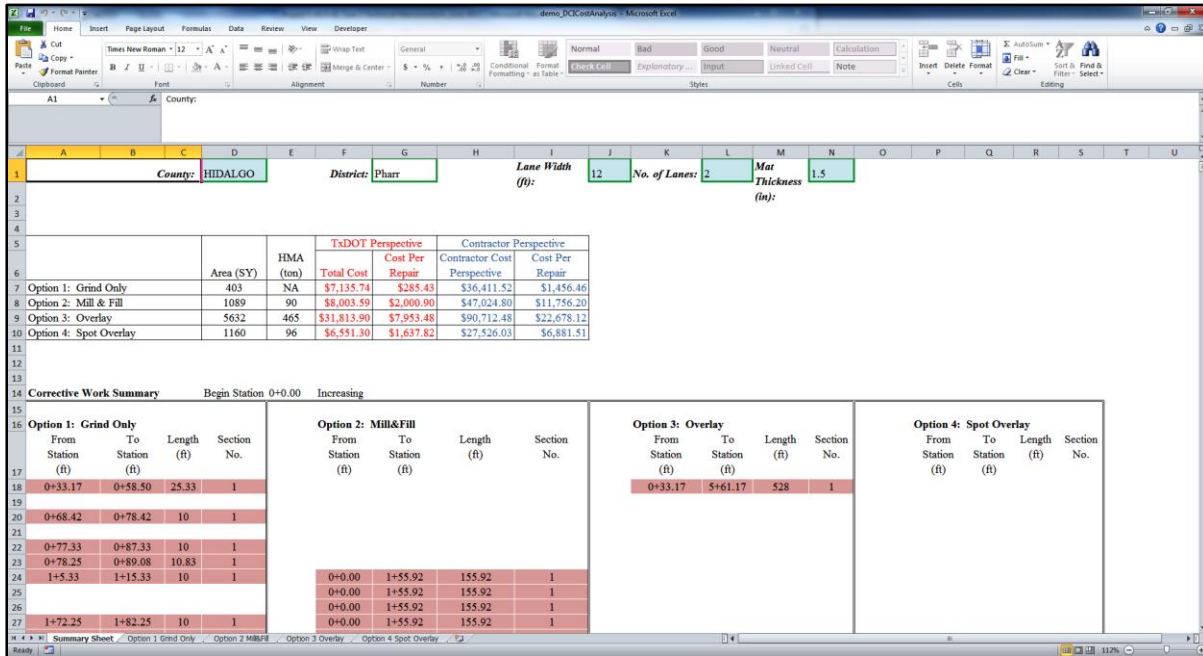


Figure 1. Spreadsheet of Cost Estimates from Grind Diagnostics.

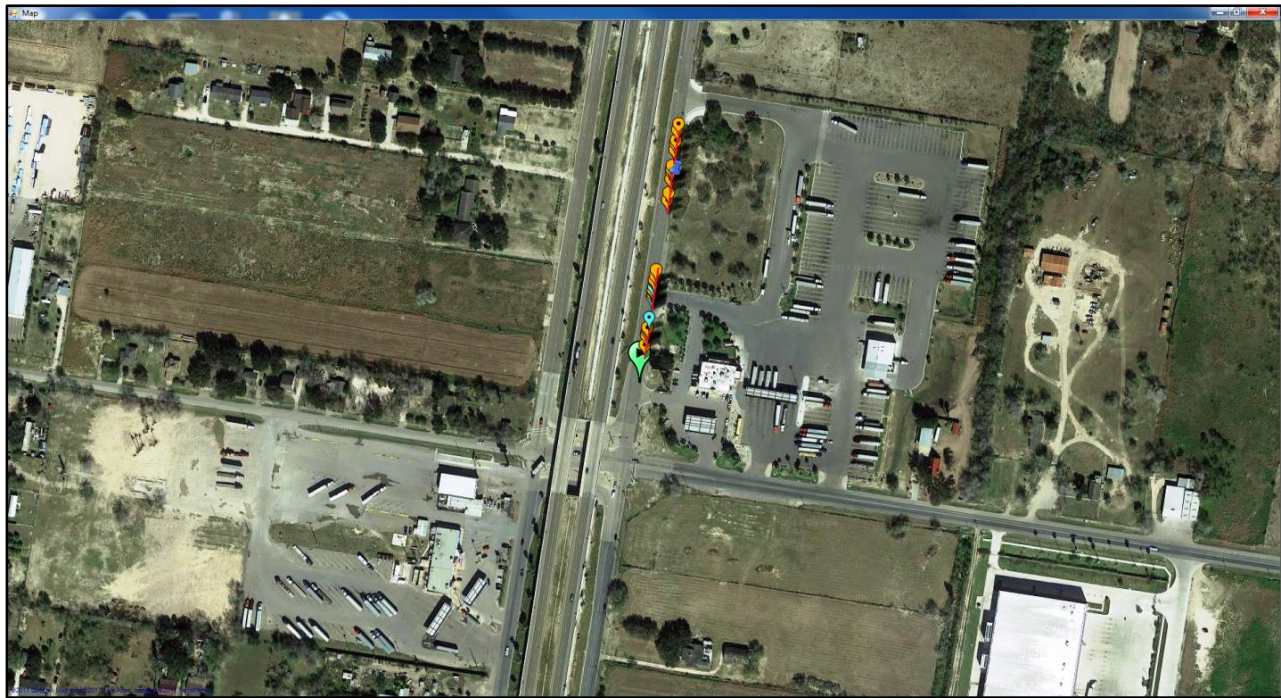


Figure 2. Illustration of Map Identifying Defects Needing Corrective Work.

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