

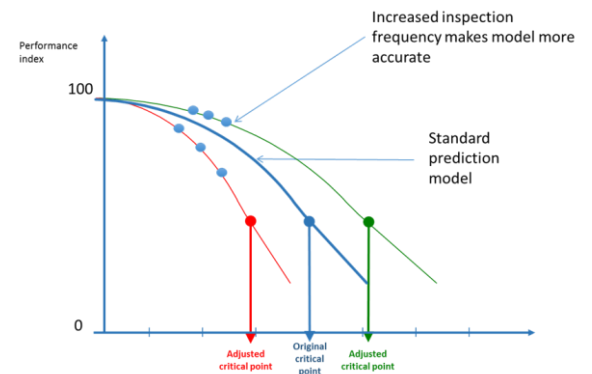
Aiding Road Prediction Models

Application Overview

Pavement management principles are based on the use of infrastructure degradation models to help predict when a pre-determined rehabilitation point will be reached. Rehabilitation, maintenance operations and investments are planned accordingly.

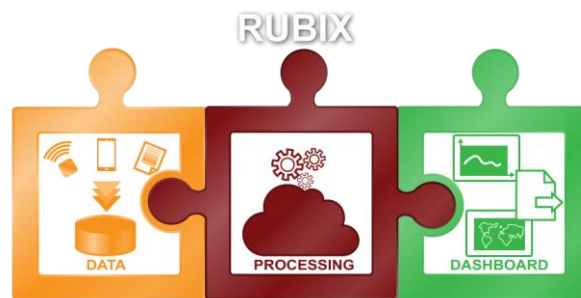
In order for degradation models to be accurate, precise information are required for the roadways as-built structure, subgrade environment, and traffic usage. Those base parameters are not always available and accurate, and can be costly to obtain for network wide analysis. The risk of not using accurate parameters is to miss critical degradation points resulting in poor selection and budgeting of a rehabilitation strategy.

An alternative approach to aid existing degradation models is to perform frequent inspections to provide more data points relative to the actual degradation of the roadway. With its integrated maintenance and update workflow functions, RUBIX is an ideal tool for such an approach.



Integrating inspections into roadway operations

- **Road Roughness:** Data collection is accomplished with **rRuf**: an iPhone app that turns your device into a fully automated class-3 roughness sensor when rigidly mounted to the windshield of a vehicle.
- **Pavement Distress:** Once the initial network roughness assessment is done, updates are done on critical or targeted segments.



Degradation analysis: The RUBIX processing engine converts **rRuf** and **rRate** raw data into a segmented road condition maps with statistical and historical analysis functions.

Benefits

- Establish optimal degradation rate using frequent inspection
- Roughness data can be collected from municipal vehicles allowing for continuous yearlong data collection at no extra operational cost
- Target inspection on critical roadway sections
- Complement existing automated inspection data collection cycles
- Monitor seasonal changes and impacts

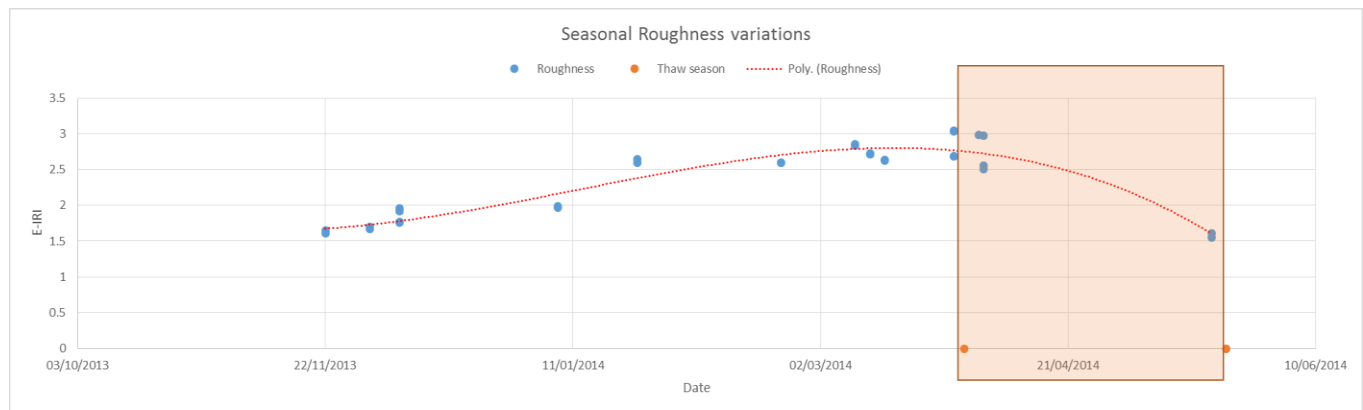
Enabling Effective Decisions

An agile inspection process

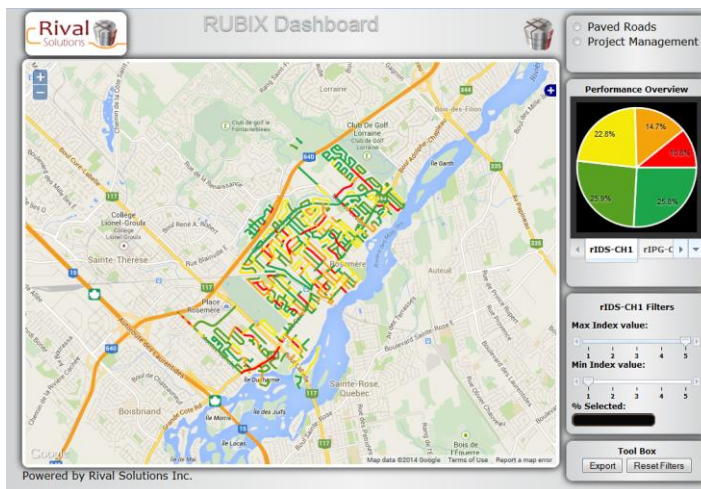
Targeted inspection of critical road sections

RUBIX optimizes the roadway inspection process by providing simple and efficient methods to identify good, fair, and poor roadway sections:

- Roughness data can be used as a pre-screening tool using correlation between roughness and distress levels, and filter out road sections in good conditions quickly from further inspection and;
- Using the RUBIX dashboard, a quick report can be generated on existing road condition status to identify critical road sections that are to be monitored.



This graph shows the usefulness of continuous roughness presenting the variation over the course of a year for a given road section. Thaw season is highlighted in orange.



Network inspection cycles can be adapted to road condition current status. Following the degradation models, degradation rate for roads in good condition is slower thus inspection effort can be applied where it is most needed. The chart above shows that over 50% of this road network is in good condition.

