RUBIX Application Spotlight

Resource Road Condition Monitoring

Project Overview

The Cameco-McArthur River mining operation (Saskatchewan, Canada) is the world's largest high-grade uranium mine. Ore grades within the deposit are 100 times the world average, which means the operation can produce over 18 million pounds of uranium each year by mining only 150 to 200 tons of ore per day.

The mined ore is trucked to the Key Lake operation for milling over a 92 kilometer stretch of all-weather gravel roadway. The maintenance of this roadway is handled by on premise equipment.

Cameco engineers contacted Rival Solutions to conduct a pilot project to provide an automated and mechanical method to monitor the condition of the road in order to anticipate and trigger improvements more rapidly. The objective and investment in the technology will ultimately lead to less wear and tear on the hauling trucks, keeping them on the road more and reducing repair costs.

A simple approach, with a high value return

Rival offers a variety of solutions from the core RUBIX platform to conduct roadway condition surveys. Given that the goal of this project was to provide automated condition assessments with rapid data turnaround, the road roughness performance metric was chosen as the driving condition indicator. Thus, this workflow was selected for the project.

Road Roughness

Data collection is accomplished with ***rRuf***, an iPhone app that turns your device into a class-3 roughness sensor when rigidly mounted to the windshield of a vehicle. The data is sent seamlessly to Rival's cloud processing services where the data is aggregated, and converted into 1 to 10 scale on the condition of the road. Finally, the data is reported every 100-meters through a map based dashboard where the information can be reviewed and exported for further study.

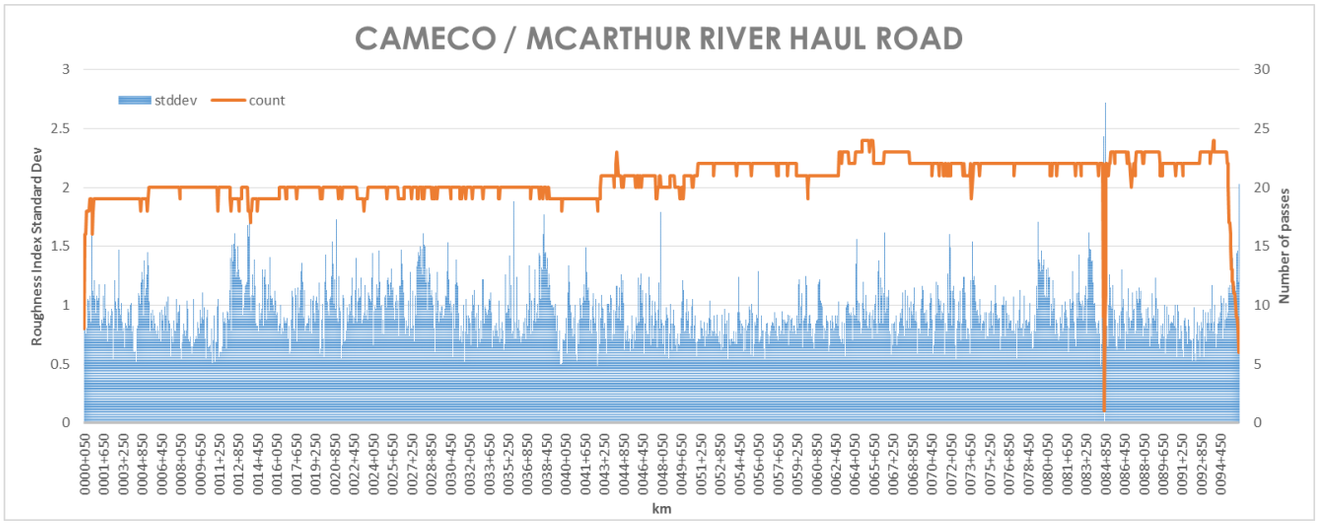
Project Highlights

- 92 km stretch of gravel roadway collected close to daily for roughness
- 2000 km and 20 + passes of data collected and continuously aggregated throughout 6 weeks of collection
- Average road roughness data turnaround time of 10 minutes once sent

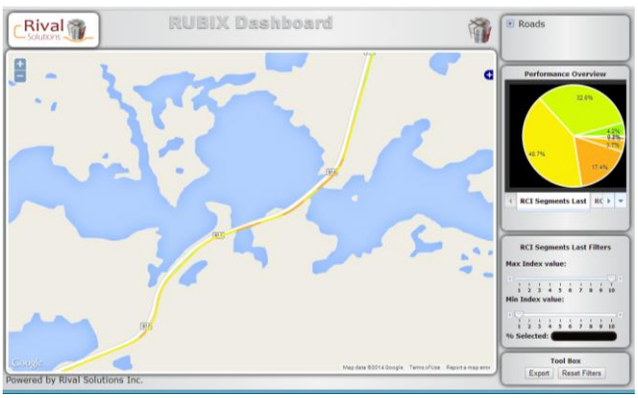
Fast Data, Fast Decisions

RUBIX allows instantaneous access to information aggregated from the raw data collected in the field. Data from ***rRuf*** is sent automatically every 15 minutes via cell network or when preferred wireless networks are detected. The data is positioned via the device's GPS, mapped against a base GIS file, and aggregated with any existing data at the same km location.

Cameco engineers monitor this data frequently (days) and deploy remedial actions to locations presenting poor results. Aggregated metrics, such as condition standard deviations over the time, are also used to identify areas that are frequently problematic. These areas present frequent failures, typically due to poor drainage systems (ditches) and/or crown, and are not able to adequately drain water during rain periods. These instances are candidates for larger capital improvements, as it relates to gravel roadways, to reduce failure rates and thus wear and tear on the large hauling trucks.



This graph shows the roughness variation (blue) over the course of the pilot and the related number of passes (orange). Areas presenting low standard deviations indicate strong performing sections of roadway while spikes indicate more frequent changes in gravel road condition.



A small section of the Cameco / McArthur river haul road showing current problems (rough) areas in orange. Data is reported to this dashboard rapidly once sent from the rRuf iPhone app.

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