BUSINESS CHALLENGE

Within the rail industry, there is nothing more critical than the integrity of the track itself. Unfortunately, it is common for segments of track to experience cracking or breakage, which significantly increases the likelihood for derailment. In fact, some rail companies may experience hundreds of instances of broken track in a single year, with or without catastrophic failures. The likelihood that a piece of track may become defective is contingent on many factors including, but not limited to: track characteristics (e.g., metallurgy), wear and tear, harsh train handling, contact fatigue, and environmental conditions.

Some organizations specialize in collecting data specific to flaws or defects in the rail track itself. Such data is often captured by specialized trucks that drive over the track and scan it for defects. Data are collected via special ultrasonic defect detection equipment that can see inside the track itself. If a potential defect is identified, a technician will conduct further testing on a manual, hands on, basis.

In any case, a detection truck must drive over the track in order to initiate a repair, thus in most cases, defects are discovered by happenstance leading to reactive maintenance and repair. These findings, coupled with the cost potential of failures, far outweighed the mandates for risk mitigation strategies.

THE SOLUTION

Predikto was hired to develop an automated machine learning solution to predict where, specifically, defects were most likely to occur within North America’s 140,000 miles of track network. The goal is to move the industry toward predictive maintenance and
operations for railroad track.

The output from Predikto’s automated solution (i.e., the predictions) were to be interfaced with the customer’s pre-existing data visualization system so that the information could be used immediately and the customer could continue to use their own interface.

Using the information provided by Predikto, the customer now knows what specific half-mile segments of track are most likely to experience a defect at some point during the following 3 months. This lead-time allows the customer to properly schedule and procure for predicted failures, thus reducing operational costs.

RESULTS
The Predikto Track Defect Prediction Solution provides actionable predictions on which half-mile segments of track are most likely to experience a defect well in advance of it actually occurring.

The Predikto platform was used to make predictions on defects based on data provided by the customer including information about ultrasonic readings, historical defects and track details, information provided from the Class I Railroad company owning the track (e.g., train movements, tonnage, etc.), and data built in by Predikto (e.g., weather).

With upward of 3 months notice, response to potential defects could be triaged based on geographic area, helping to optimize maintenance correctly and identifying over 20% of defects before they occurred.