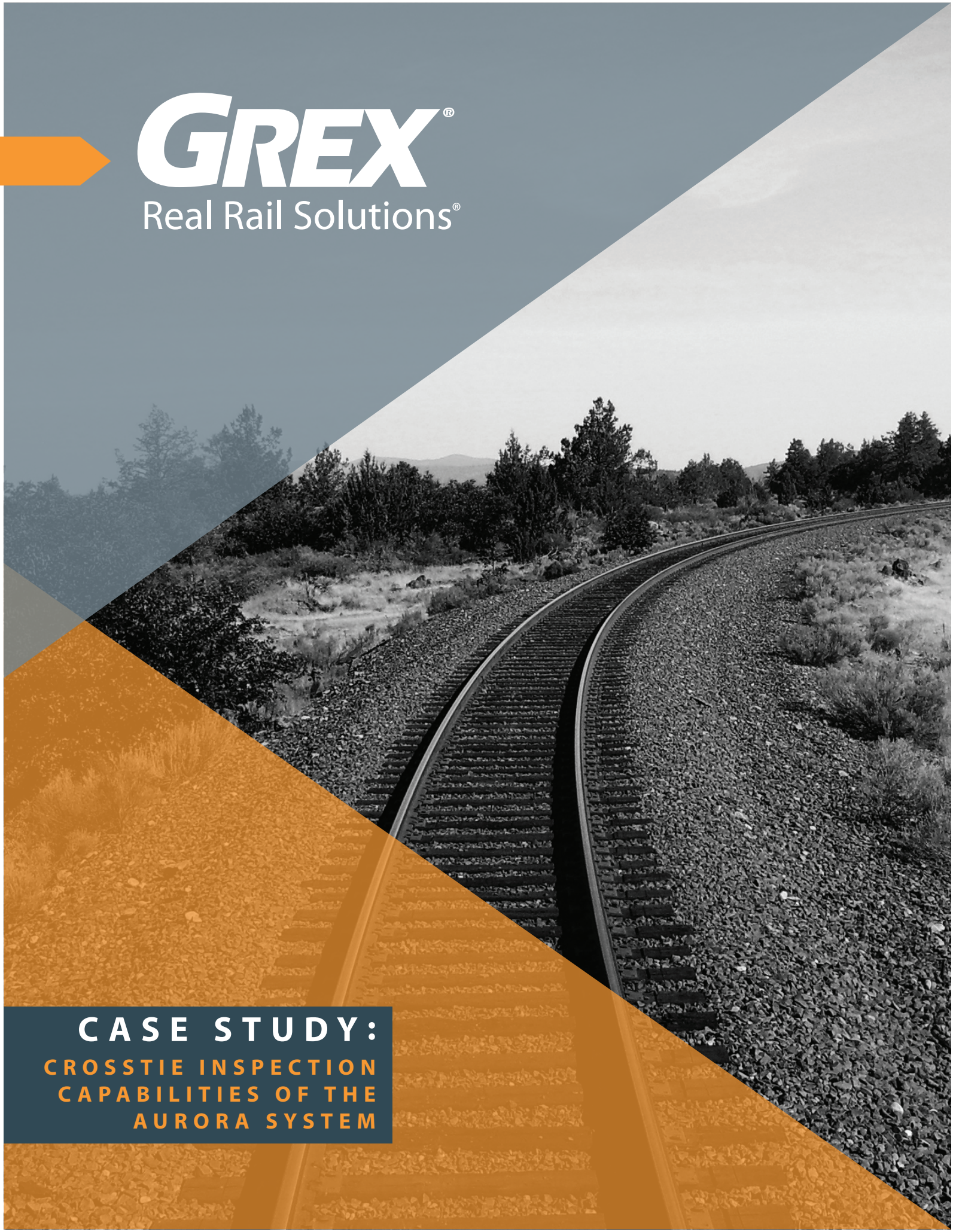
GREX®

Real Rail Solutions®



CASE STUDY:

CROSSTIE INSPECTION CAPABILITIES OF THE AURORA SYSTEM

GREX®
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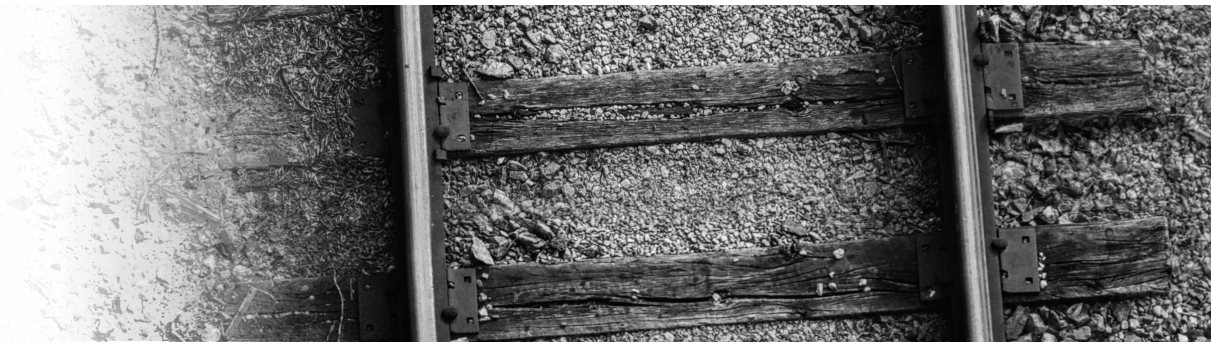


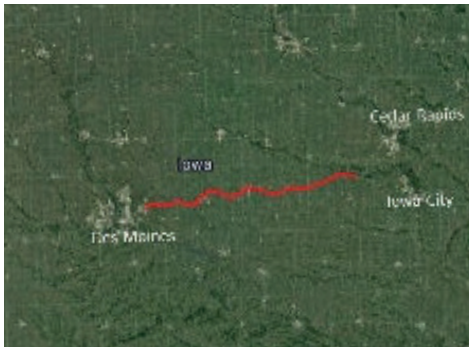
CROSSTIE CLOSE-UP

A partnership between Georgetown Rail Equipment and the Iowa Interstate Railroad showed the extensive crosstie inspection capabilities of the Aurora system.

The Iowa Interstate Railroad used the GREX Aurora® tie inspection system to evaluate the tie condition of more than 120 miles of track.

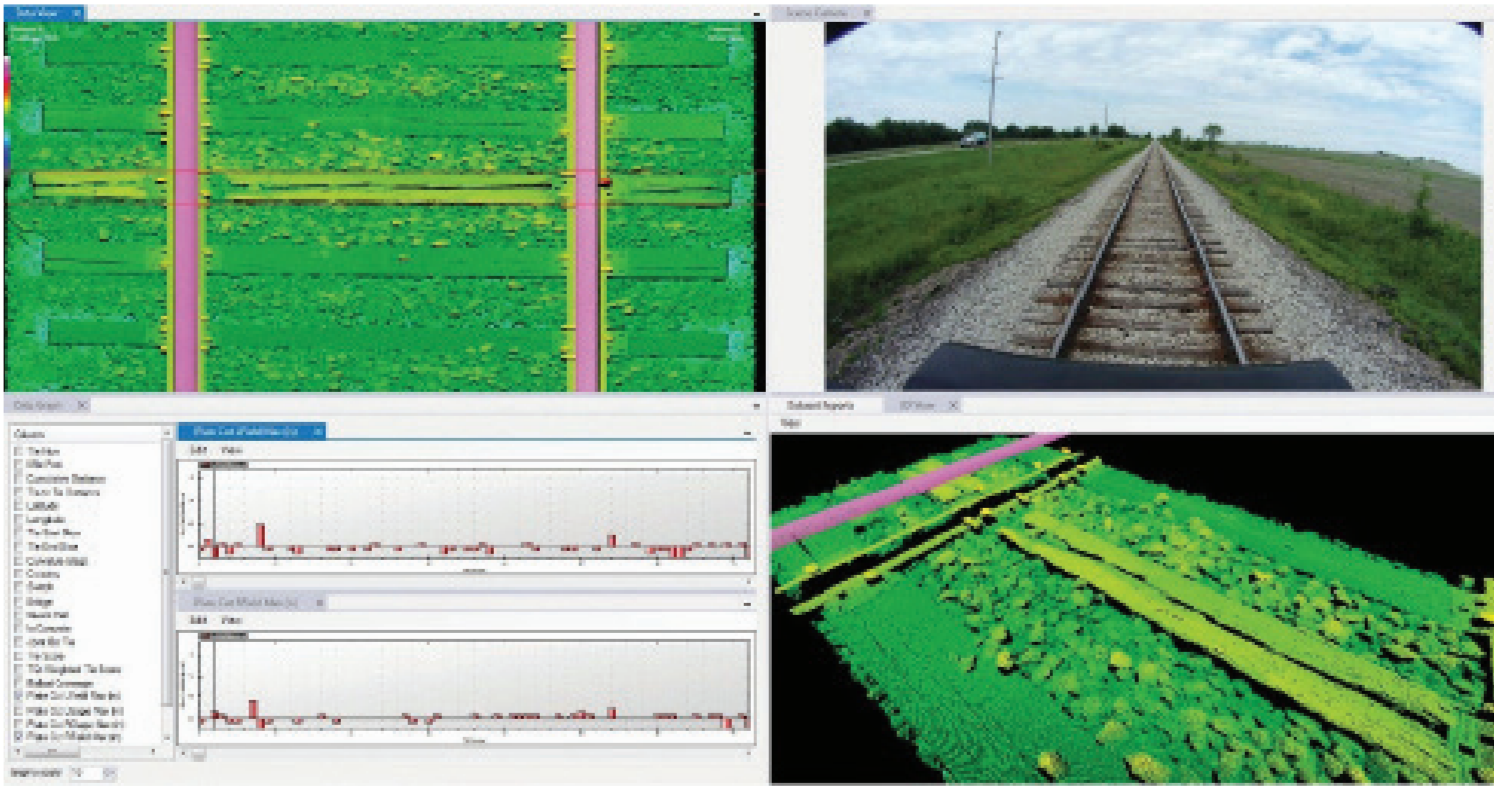
Iowa Interstate Railroad (IAIS) is a regional Class II railroad with operations between Chicago and Peoria, Illinois, and Council Bluffs, Iowa, operating over 550 miles of what was originally the heart of the Rock Island system. Since taking ownership of the railroad in 2005, the Railroad Development Corp. has made significant infrastructure investments that have resulted in a viable, well-maintained railroad. IAIS selected Georgetown Rail Equipment Co. (GREX®) to perform its automated track inspection service for tie condition assessment and for inputs into its maintenance and capital planning programs. According to Chad Lambi, Chief Engineer for the IAIS, there were two significant benefits to using the Aurora system for tie inspection: consistency in tie evaluation and more efficient use of tie capital. IAIS maintains nearly 460 miles of track, most of which

Aurora® keeps GPS records of track inspections.



is maintained at a minimum of Class III standards. The IAIS maintenance portfolio is split into three territories, and each is assigned a roadmaster. Before use of the GREX tie inspection vehicle began, all ties were graded by manual visual inspection, typically by the territory's roadmaster or other qualified personnel. Throughout the IAIS system, tie evaluation may have been performed by a few different individuals, which could mean inconsistencies regarding defective tie counts. To assess

crosstie conditions on IAIS, GREX deployed the Aurora® system, which operates on a hi-rail platform up to 40 mph. The technology creates a high-resolution 3-D image of the track using lasers and high-speed cameras. Data is synchronized using differential GPS, a rate gyro and wheel encoder to provide accurate position information for every crosstie. Machine vision algorithms use the 3-D data to automatically perform crosstie condition assessments, ensuring tracks meet industry regulation standards and



The GREX Aurora® system provides railroads with several different methods to view and analyze the collected data. Photos courtesy of Georgetown Rail Equipment

calling attention to any needed updates or repairs. Aurora has scanned more than 150,000 miles of track across the United States and Canada, including freight, passenger, commuter and transit lines. GREX has continually improved the system, adding the ability to inspect fasteners, anchors, joints, turnouts, grade crossings and open-deck bridges along the way. The initial scans on the IAIS system consisted of approximately 120 miles of automated inspection, and the scans were performed in a few hours within available track time windows. IAIS soon received a list of every tie identified by the machine vision algorithms, each tagged with a unique GPS coordinate and milepost. The condition of the tie is typically reported as a number grade between 1 (good) and 4 (failed), which is determined by a multivariate model of tie condition based on the variables a tie inspector would check. A summary report determines the tie grade distribution for each mile, so the railroad is able to compare the defective tie rate across its system to focus on areas in higher need of tie replacement. Additional reports that can be generated include plate cut reports, component reports, curve condition reports and maintenance level reports that identify the number of functional ties in a 39-foot segment and other factors that can help ensure Federal Railroad Administration compliance. Customers are provided access to all collected data on a GREX hosted web viewer, where they can select a specific location to see 2-D and 3-D views of the track, GPS map location, camera views from the truck and graphs of various track measurements and conditions. "When one considers the variables between multiple inspectors grading ties while simultaneously applying tie replacement logic, it is possible for inconsistencies to arise. The GREX system benefited IAIS by removing these variables and applying a consistent tie grading process across the entire system," said Lambi. The automated tie grading system has provided a more efficient distribution for the IAIS tie program and subsequently more efficient use of its tie capital. In years past, it was typical to figure an "average" tie count per mile. When marking ties manually, each inspector always kept in mind this number and often ended up marking an amount of ties not far from the average. If the tie condition across the railroad is already consistent, this approach can work. "However," said Lambi, "after running the inspection vehicle, the variations in tie conditions per mile were found to vary significantly, and tie counts were adjusted appropriately per mile based on actual conditions. His approach also helps identify clusters of defective ties that must be addressed." The results seen at IAIS show that regional and short line railroads stand to benefit from consistent, reliable inspection data that allow for accurate prioritization of capital spending. Recent capital programs have included significant crosstie investment, and incorporating inspection technology into the planning process will improve safety and allow for the efficient allocation of resources.