

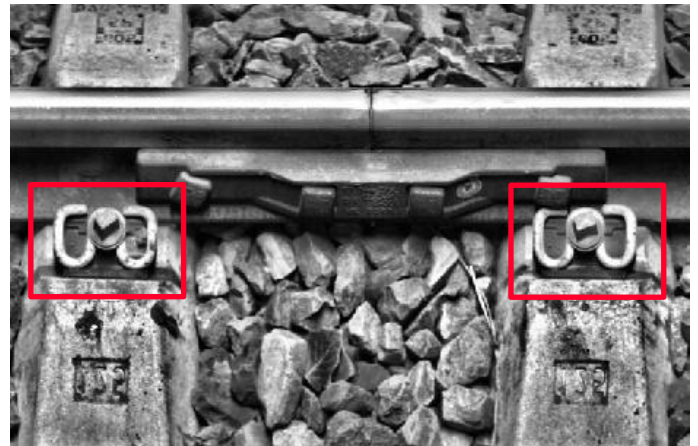
Track Condition Videomonitoring

Passenger train-based infrastructure monitoring system

We are implementing a train-mounted acquisition system that records the full track during normal passenger service.

The system uses four line-scan cameras to continuously capture high-resolution imagery at line speed; all data are time-stamped and geo-referenced for downstream processing. The pipeline enables algorithmic evaluation of track and lineside features and the extraction of events and trends for integration into infrastructure dashboards or maintenance workflows, with configurable interfaces and thresholds.

The approach currently being tested on S-Bahn Berlin improves predictive maintenance and enhances the operational performance of a heavily used rail network.



© VQ.TVP 4 Minden – High-resolution close-up of a rail fastener captured by the train-mounted monitoring system

Our services

- Equipping passenger trains with robust, high-resolution line-scan/video units for autonomous full-track acquisition during normal service
- Utilization of recorded data for early damage detection and assessment of surrounding rail/track features
- Processing recorded data and providing analyses, tailored to customer-specific requirements
- Developing custom ML-based image analysis for defined inspection objects
- Operating and maintaining the onboard system under agreed SLAs with secure and compliant data handling

Reference projects

- As part of a retrofit program, a TRL 6 demonstrator was integrated and deployed on a Series 481/482 S-Bahn-Berlin train in regular passenger service.
- High-resolution bidirectional oblique rail imagery plus forward-facing track view; continuous on-board recording and preprocessing for monitoring isolated rail joints (IRJ).
- Continuous recording at line speed live since Q1 2026; building an ML dataset for additional track elements; from Q2 2026: first live IRJ data transmissions to infrastructure operators and gradual rollout of automated condition assessment, aligned and quality-assured with system operators.

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