

Autonomous Defect Logging System

Fact Sheet

The Department of Transport and Main Roads (TMR) moves and connects people, places, goods and services safely, efficiently and effectively across Queensland.

RoadTek provides transport infrastructure solutions throughout Queensland as a commercial business within TMR, including:

- civil construction and maintenance
- structures, maintenance and rehabilitation
- traffic and electrical services, including intelligent transport systems
- linemarking services
- emergency response to disruptive events and infrastructure failures.

Project overview

RoadTek performs services that include the identification of asset defects for the purpose of rehabilitation and repair. This process is a time consuming manual task that involves workers (e.g. back loggers) traversing the network to undertake visual inspections to quantify and log defects.

- 2018 - Phase 1 saw RoadTek and Retina Visions (RV) partner to successfully implement the use of image recognition software capabilities.
- 2019 - Phase 2 saw RoadTek apply RV's technology in an operational setting to assess its practical application that produced beneficial results.
- 2022 - Phase 3 provides RoadTek with the opportunity to process the raw data currently being recorded in the Autonomous Defect Logging (ADL) system to produce outputs that will improve maintenance planning capabilities and work management practices statewide.

The challenge

TMR is responsible for managing and operating Queensland's network of approximately 33,336km of roadway. RoadTek is responsible for ensuring the maintenance of a significant portion of Queensland's state-controlled road network.

Currently there are defect back loggers based across RoadTek's nine operational units in Queensland performing manual inspections in vehicles and on foot to log defects.

The nine operational units maintain various road maintenance contracts, have variable maintenance service levels, operate in different work environments, and have varying levels of understanding and acceptance of what is achievable.



Image: Positioning of Retina Visions camera that is attached to the internal windscreen of the back loggers vehicle and requires no manual interaction. Installation of the Retina Visions camera takes less than 10 minutes.



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The benefits

The project deployment phase 3 is in its early stages and the initial benefits include:

- increased worker safety due to the reduced requirement for workers to enter the road corridor to undertake defect detection.
- improved data consistency and quality due to autonomous capture technology and machine learning of data processing.
- improved data availability (near real-time) due to autonomous capture technology and connectivity to the Asset Maintenance Management System (AMMS).
- increased visibility of backlogged defects.
- increased opportunity to redeploy resources to other critical operational activities.
- reduced duplication across product lines through collection of data autonomously and sharing to relevant RoadTek product lines and operational units.



Image: The ADL system identified a pothole defect on the road.

ADL system facts

The ADL system provides an average of 95% accuracy level (and some defect types higher accuracy) compared to manually collected data. These defined defect types included:

- roadway - cracking, crocodile cracking, faded linemarking, flushing, graffiti, litter, overhanging branches, ponding water, potholes, raveling, shoving, sweeping and vegetation
- barrier - deformed
- guidepost - deformed.

It should be noted that the system and technology is improving in accuracy as time goes on. There is future opportunity to include electrical and other structure related assets.

Project timeline

