RoadMetrics
Case Study

Devon County Council Trials RoadMetrics AI for their Principal 'A' Road Network

Introduction

Devon County Council manages the largest road network in the UK, covering approximately 13,000 km. This network includes major highways, urban roads and rural countryside roads.

Managing such a vast infrastructure is a significant challenge, which is why the council is exploring innovative approaches, such as AI based road condition surveys.

Innovation Trial

After an early trial in Exmouth in 2022, Paul Davis, then Highways Asset Manager at Devon CC, successfully built a business case for a broader implementation of AI based road condition assessments.

Building on the trial's success, Devon County Council adopted a strategic, staggered approach to implementing this technology.

Meeting with Devon CC's Highways Team

In October 2023, the council procured a 12-month innovation license to deploy AI style surveys across 1,042 km of Devon's Principal 'A' road network.

This phased implementation allowed for a detailed evaluation by their Highways Asset Team, now led by Rob Turner, to validate the AI system's performance, through a comparison with traditional methods including SCANNER and CVI surveys.

The evaluation output will lead to assessing the accuracy, long-term benefits of an AI approach, and future integration into the council's road maintenance strategy.

Solution

Using cost-effective smartphone based hardware equipment and a cloud-hosted web-GIS platform, condition assessments were performed.

RoadMetrics' unique applications:

- **Planned maintenance**
Adhering to DfT's PAS2161 New Data Standard and UKPMS guidelines, a road condition report can be used to allocate budgets and build prioritisation Forward Works Programmes.

- **Reactive maintenance**
Further ad-hoc surveys throughout the year to assist highway officers pick up road defects and assets to asset management systems.

Implementation

The condition surveys were setup and led by Richard Brown and driven surveys performed by two highway officers, Kale Shokar and Zoe Fursman, over six months.

Between October 2023 and February 2024, a total of over 1,100 km of Devon's Principal 'A' Roads were assessed.

As part of this evaluation, a control route assessment covering 57 km was performed in August 2024 using RoadMetrics AI v2 to further explore the system's advancements.
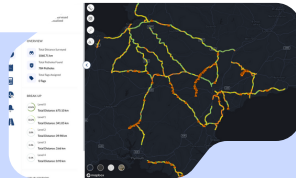
Further, the output was re-calibrated by RoadMetrics, for their team to facilitate a direct comparison to SCANNER surveys.

Trial Objectives

On-demand Survey

With less hardware calibration, highways team can perform survey flexibly opposed to traditional method

Digital Twin

Video footage of road network with objective assessments and auto-generated reports for auditing and building schemes

Inventory Mapping

Track asset information and Bluetooth clicker points for inspector validation of road safety critical defects and other points-of-interest

Challenges

Long turnaround time and limited coverage with manual inspections

No automation and multiple site visits

New Developments

- Tested accuracy in wet weather
- Data visualisation feature
- Converted 10 meter sections with USRNs

Key Findings and Future Developments

- The solution expedited the survey process, with 30% cost savings.
- Received digital twin and objective AI assessment of the road network, streamlining operations.
- GIS platform for visualising defects and assets, and analysing filtering based on inspection runs.
- Data export options in HMDIF, CSV, GeoJSON, and PDF formats for developing Devon CC's highway asset management strategy
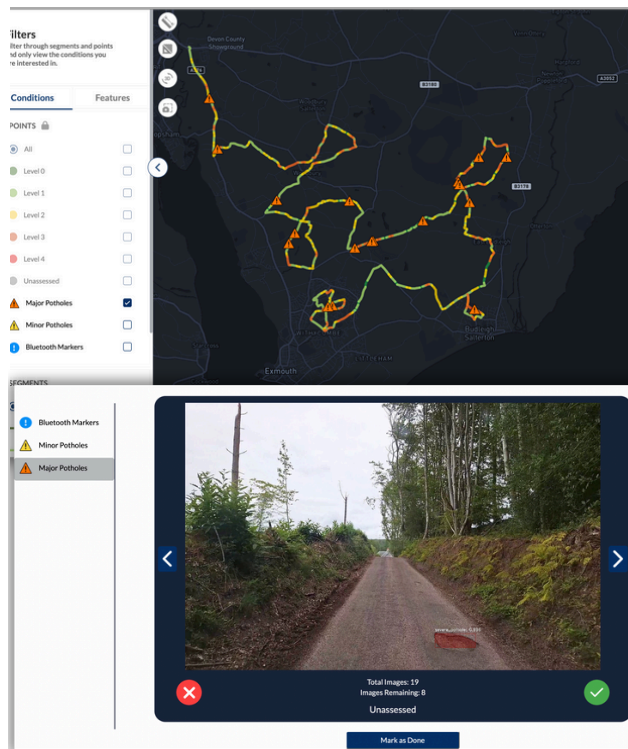

Automated road line marking assessment
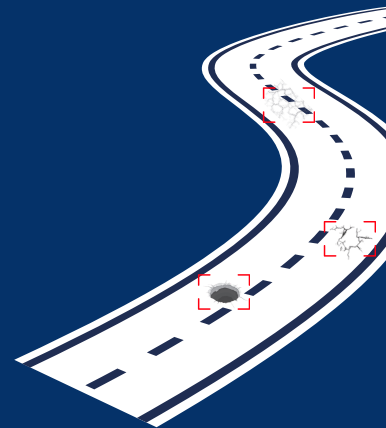
API integration with asset management systems

Improved reporting with road classifications and USRNs

> *What I want to see with AI, is that I want see more technology incorporated in our inspection process. We have a massive network of 13,000 km which has a significant impact on the time taken for inspecting and looking at the defects. AI would free up our inspector resources to focus on other things such as auditing and looking at more defects that need a detailed investigation.*
> – **Paul Davis, Highway Asset Manager, Devon CC**

Conclusion

The 12-month innovation trial license of the RoadMetrics AI System for Devon County Council has demonstrated the value of AI-driven road condition monitoring. By adopting a strategic and phased approach, the council successfully validated the technology's potential to improve operational efficiency and provide actionable data.

Further ongoing evaluation of the results, based on the DfT's PAS2161 New Data Standard, will provide insights into the implications and cost-savings in expanding the usage of AI across Devon County Council.