



Next Generation Operations: Asset Maintenance Efficiency

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The project sought to improve efficiency for Main Roads WA's maintenance operations by identifying problems and improvements in the use of systems and practices. The project covered routine maintenance and in particular the identification and management of road defects.

Background

Global events and socio-economic changes have significantly impacted MRWA's operations. Efficiency and system improvements are needed to respond to resourcing problems, major events, technological change, and increasing costs.

MRWA records around 180,000 road defects per year and has processes to inspect, report, plan and repair the defects. The defects range from road surface and pavement defects to vegetation, signs, litter, edge markers, line marking and drainage. The image below shows an example of flushing, rutting and stripping defects on a MRWA road.

Albany Highway WA, showing road defects



Source: NTRO 2023

Approach

The research and analytical aspect of the project involved a comparison of procedures with two other Australian state road agencies, reviewing MRWA documentation and defect definitions, analysing trends in over 1,000,000 defect data records, and exploring emerging technologies.

The practical aspect of the project involved running workshops with each MRWA region's staff, to identify the extent of different problems and opportunities in routine maintenance practices.

Review of Defect Definitions and Data

The defect definitions (referred to in the past as routine maintenance intervention parameters: RMIP) were reviewed and including workshop feedback some notable findings were made. These included the use of subjective judgement to determine defect risk, problems with dimensions, over 150 defect definitions that were rarely used, and problems in terminology.

Fifteen methods were used to analyse 5½ years of defect data, including the top 10 most used defect types, numbers of defects and response times, changes by month and year, and priority. It was identified that there are many factors that can affect the numbers of defects being reported and repaired by a region such as major events, seasonal effects, and batching of work in inspections and repairs.

Workshops with the Regions

One-day workshops were held with each region with 96 staff attending from many levels of position. Feedback was encouraged through the use of open-ended questions, the seeking of input from each attendee, and the use of Mentimeter for anonymous text and poll feedback.

Workshop feedback all regions on most important resourcing problems relating to routine maintenance



From the workshops 932 comments were recorded as feedback. NTRO then reviewed these and provided 727 suggestions. Many of the feedback items covered common subjects, leading to 10 key recommendations.

Late in the project site visits were undertaken of some region's depots to identify opportunities to improve depot operations. This led to further suggestions specific to the depot operations.

Findings

There are ten key recommendations:

1. Upgrade of field data collection tablets and software.
2. Rectify photo resolution problems in data collection.
3. Improve regional communications.
4. Review and update all defect definitions including priority, defining risk, creating a visual field guide, removing subjective terms, and reviewing the function of MDC and MRT.
5. Develop and improve coordinated cross-organisational user groups for a range of functional areas.
6. Review how major incidents are managed.
7. Develop and improve processes for reporting defects and setting priority.
8. Develop a process of verifying inspections to manage resource needs and work quality.
9. Provide for cost tracking in MMIS for special events.
10. Develop a defects detection technology trial process.

Future Opportunities

The key recommendations lead to potential future projects for MRWA or under WARRIP:



How does this research change the way we think?

The overall finding is that by making dedicated improvements to existing processes and systems and supporting staff development, MRWA will be able to resolve many of the problems and gain long term improvements in efficiency.

In the long term further efficiency, safety and other operational benefits can be realised from a structured introduction of emerging defect identification technologies.