Case Study Project: Network Operations Data Visualisation

Client: Main Roads Western Australia

Overview

Key to managing any asset is a clear understanding of the current and expected performance levels of the infrastructure. To this end it is important to have metrics and indicators that are quantifiable and measurable against real operational data.

Network operations is a growing field that looks to essentially maximise the performance of the asset by better managing capacity and user behaviour through built and non-built technologies.

The Study

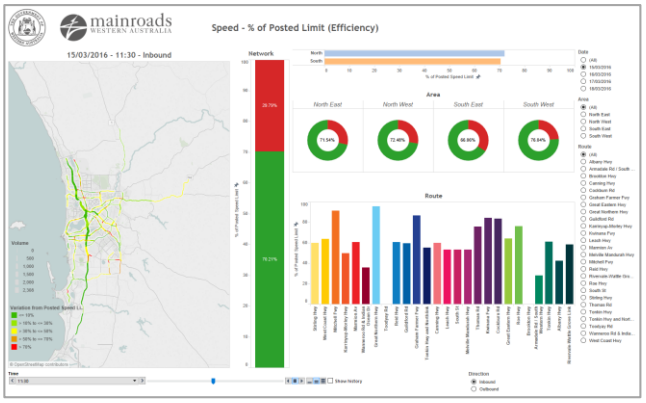
Urbsol was engaged by Main Roads to prepare a complete set of data visualisations and interactive dashboards based on pre-prepared network performance data using Tableau and to assist with the deployment of this important tool within the Network Operations directorate.

As responsible network managers, Main Roads have access to a wealth of existing road user and asset performance data including:

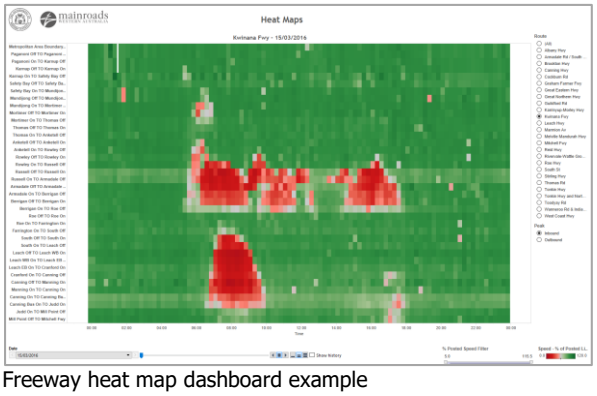
- Traffic volumes
- Traffic speeds
- Accidents

This project involved employing cross-relational databasing and geospatial methods to analyse a range of performance data and compare current network operation against established National Performance Indicators (NPIs) including:

- Travel Speed
- Reliability
- Efficiency
- Productivity



Efficiency NPI dashboard example

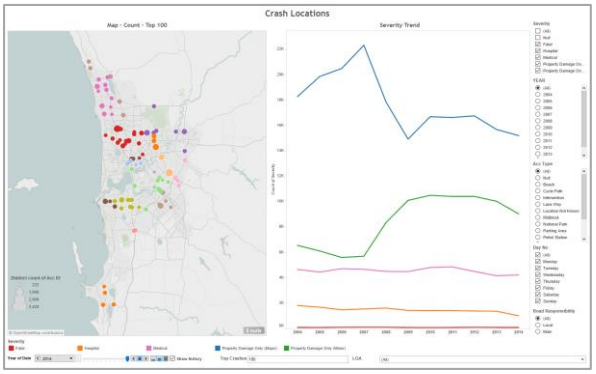


Freeway heat map dashboard example

Data Visualisation

Data visualisation techniques were employed to show the cross relationships between metrics at the area and route management levels to allow for efficient annual reporting on performance.

Dashboards were also prepared with location specific performance drill-down capabilities meaning problem sections of routes and specific intersections could be filtered out and identified for further investigation.



Crash data analysis dashboard example

Tableau was chosen as the most suitable tool for this project for a number of reasons:

- Strong visual analytics
- Readily deployable outputs
- Simplicity of dashboard creation
- Strengths in cross tabulation and relational databasing
- Ability to provide filters across all data levels
- Geospatial display capabilities
- Ability to allow end users to interact with the workspaces to apply expert knowledge and experience to obtain deeper insights

This project resulted in the successful preparation of visualisations that will serve as an ongoing tool for network performance reporting and analysis.