



Transport Case Study

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Business issue 1

Severity of road accidents

The severity of road accidents and number of fatalities was increasing. The Transport Department wanted to know the factors that drove this increase, and which of them could be used to efficiently improve the key aspects of road safety and performance.

Solution

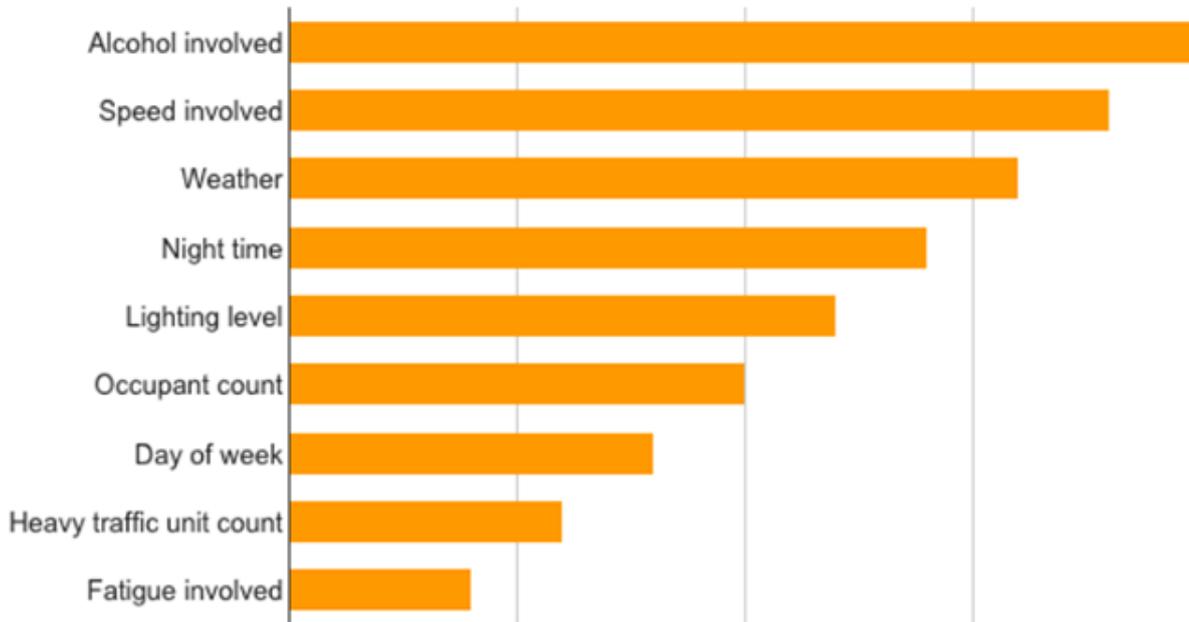
We used the organisation's own asset and road safety data to identify the key levers and rank them in order of importance. The solution was entirely data-driven. We used:

- Streaming data - traffic counters data and GPS data on buses and other selected vehicles
- Road characteristics data - lights, number of lanes, road assets etc
- Road accident data - incident attributes, date, time etc

We applied advanced analytics techniques to the available data and developed a ranked list of key variables that drove the magnitude of accident and fatality rate.

The organisation evaluated each factor and devised appropriate intervention strategies to address the issue.

Key factors influencing probability of fatal road accident, ranked by importance



Findings

Not surprisingly, alcohol and speed were shown to be the top two factors. Other factors were less obvious and provided the organisation with valuable insight into its key challenges. Various intervention strategies were evaluated, including:

Deterrents

- increase fines
- closer police monitoring, especially on the higher-risk days of the week for drink-driving
- police to target overloaded vehicles
- speed cameras in accident-prone areas

Pre-emptive

- improve lighting in the areas with high accident rates

Benefits

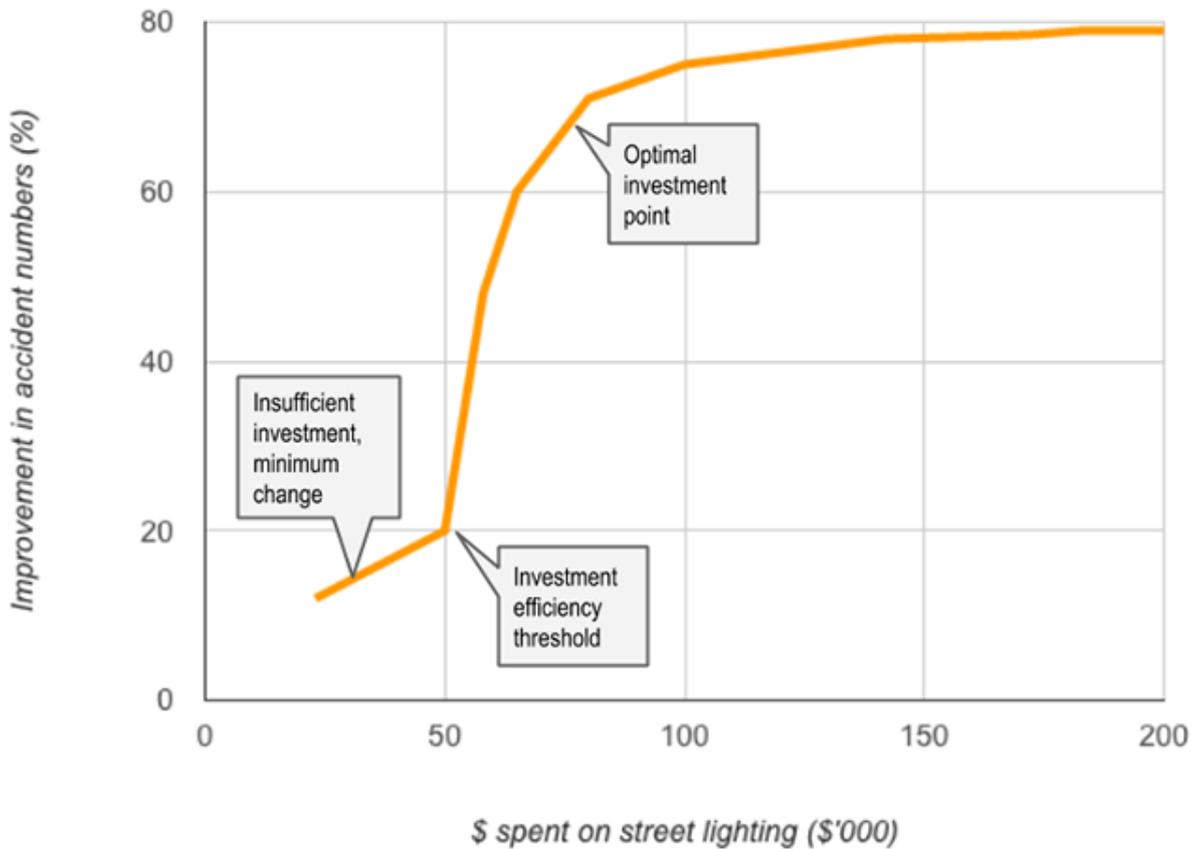
The approach provided data-driven insight into a complex problem. The analysis not only confirmed aspects of the problem already known to the organisation, but highlighted other key drivers for which intervention strategies did not already exist.

It provided the organisation with a shared understanding of the relative importance of the key issues driving the severity of road accidents and the incidence of fatalities. Resources could be devoted to the key issues and targeted intervention strategies devised that aimed to reduce the incidence in fatal accidents.

Business issue 2 Optimising infrastructure investment

As part of its pre-emptive road safety strategy, the organisation sought to invest in street lighting and needed guidance on the required infrastructure spend. Advanced analysis of historical infrastructure spend also informed the magnitude of spend on street lighting required to have a demonstrable effect on road safety outcomes. Too little spend would show no improvement, but too much would fail to proportionally improve road safety outcomes.

Improvement in accident numbers versus spend on street lighting



Additional benefits

The project was conducted at a time when heavy vehicles were considered, mainly by the media, to be causal in the increased accident and fatality rates. The analysis showed that heavy vehicle traffic was among the least important factors. This provided valuable data-driven evidence to avoid resource allocation to relatively unimportant issues.

Approach

The approach used the power of contemporary Data Science methods and was transparent, repeatable, scientifically valid and accurate.

Data Science, also referred to as Advanced Analytics or Predictive Analytics, is an analysis approach that provides businesses with accurate What-If scenarios and evidence-based proactive decision-making tools.

- It is based on predictive analysis of domain-specific organisational data. If an outcome of interest to the business can be measured, then Data Science methods can determine which factors influence it and to what extent - and based on the delivered insights, suggest the call to action.
- It has been proven and pressure-tested globally across many industries. It has been a key to the success of Google and Amazon. It is used by leading banks, insurers, telcos, retailers, manufacturers, utilities and governments to gain insight into how to efficiently improve business outcomes including:
 - targeted resource allocation
 - optimising infrastructure spend