Simulating Traffic Data in the Bay of Plenty

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INTRODUCTION

The Bay of Plenty is a fast growing area. Data from Priority One has identified an increase in traffic flows within Tauranga of 5.7%, in contrast to only a 3.9% increase for New Zealand (Table. 1). This comes at a cost financially and environmentally. A suitable traffic model must be created in order to visualise these traffic flows and develop the best plan to accommodate this growth.

Indicator Annual average % change	Tauranga City	Bay of Plenty	New Zealand
Gross domestic product	▲ 3.6%	▲ 3.5%	▲ **2.9%**
Traffic flow	▲ 5.7%	▲ 4.6%	▲ **3.9%**
Car registrations	▲ 2.9%	▲ 2.7%	▼ **-1.7%**
Commercial vehicle registrations	▲ 2.4%	▲ 3.1%	▲ **2.3%**

Table 1. *Annual average percentage change between September 2017-2018*

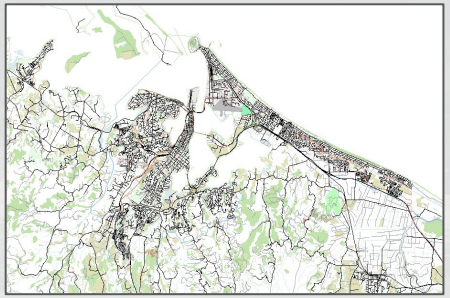
PROJECT AIM

Use Simulation of Urban MObility (SUMO) to create a Bay of Plenty network. This includes using Python to convert geographic coordinates into simulation trips from my own commuting data.

METHODOLOGY

Figure 1. *Chosen model from Google Maps*

Figure 2. *Final network model in SUMO*



The best map option was selected (Fig. 1) to include the main suburbs of Tauranga and Mount Maunganui. The model is generated through software called OpenStreetMap and converted into a network (Fig 2) to be used in SUMO. Using Google Maps Street View, manual changes were made in NETEDIT to ensure the network model is accurate.

To test whether SUMO can be used to simulate real life data, an application called Frugal Maps Journey Mapper (Fig. 3) was used to track my commutes over a period of a week. This was stored in a database, where Python code converted the latitude and longitude coordinates into the equivalent network coordinates. A simulation trip is created using the closest roads to each set of converted X and Y points from a commute.

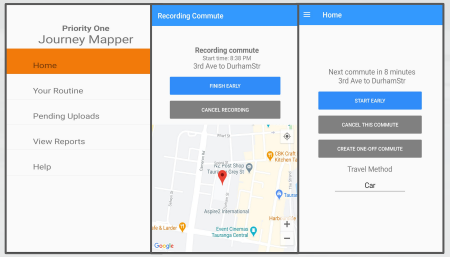


Figure 3 *Frugal Maps Journey Mapper*

CONCLUSION

SUMO is an effective tool to visualise traffic flow scenarios using real data to find ways of easing congestion. Scenarios could include altering the network to test layouts for future roading projects or developing data-targeted bus routes to encourage less single user vehicles on the road and show the various impacts of park and rides.

ACKNOWLEDGEMENTS

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Scan here to view the process behind the project and a few simulation examples