

NP3007: DEVELOPMENT AND EVALUATION OF LOW CARBON MOBILITY SOLUTIONS

DEVELOPMENT OF A SHARED USED MOBILITY CALCULATOR

Research Question

1. What are the environmental impacts of new and emerging technological opportunities to the transportation industry?

2. How can Australian cities reduce their transport carbon footprint by utilising new technological opportunities?

Background

The 2015 Carbon Emission reported that Victoria produced 119 giga tonnes of greenhouse gases into the environment. Almost one fifth (18%) of those emissions were generated by the transport sector, with most emissions coming from the road and rail industries.

“If we shift just 5% of private vehicle use to shared mode, we will reduce greenhouse gas emissions by one million tonnes annually”

If we target a reduction of private single occupant vehicles on the road, and redistribute those trips to shared use transport modes (carpool, public transport, etc), then even a reduction as small as 5% will reduce greenhouse gases by 1 giga tonnes annually.

Methodology

This research project began in April 2017 and as further literature review is completed, the proposed methodology is

dynamically changing and improving based on the research. The projects methodology is as follows:

A comprehensive literature and technical document review of the quantity of emissions generated by various modes of travel, and the typical travel costs of those modes is currently being finalised. Additional data collection is to be undertaken to fill any major data gaps and to validate some data if required.

Using the data obtained during the literature review, and origin destination data, a preliminary emission model framework will be developed. This model will be the backbone behind the calculator, and can be used to help develop additional tools.

The calculator will be built using the framework detailed above. The exact method of calculating the mode shift is still being researched and considered, but it is likely that it will be based on a traffic equilibrium model.

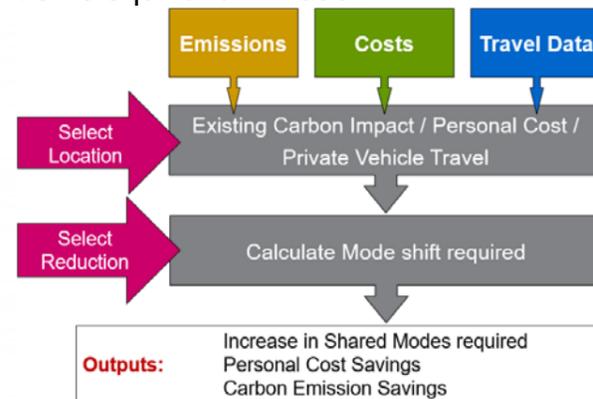


Figure 1: Simplified framework of how the proposed model behind the calculator operates.

This project will focus on Melbourne as a case study to demonstrate the feasibility of the approach, which once validated

could be transferred to other cities. To ensure that the results produced are accurate and reliable, the project will collaborate with local councils.

Results

It is important to note that Victoria has a unique energy industry compared to the rest of Australia. With a much higher generation of electricity using “dirty” energy sources such as coal. Can electric vehicles in Victoria really be considered as a “green” mode of transport?

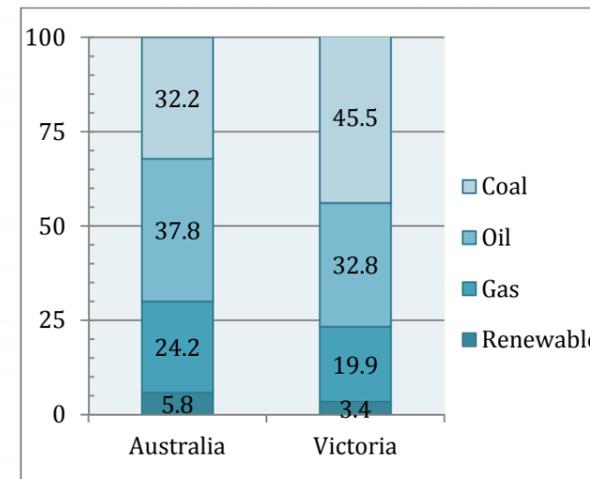


Figure 2: The main fuel types used to generate electricity in Australian during 2014-15.

In order to achieve an accurate representation of the carbon emissions for Victoria, this research is planning to consider emissions from “well to wheel”. For example, the total effective emissions of a vehicle includes both the emissions generated by the vehicle, vehicle manufacture, and the emissions generated to create the fuel source.

Conclusions

This research is still early within the

development stage, and no definitive conclusions can be reached yet. We are currently in the process of liaising with local councils so that we can understand the existing decision making processes around the assessment of shared use modes, if they consider it at all. And what type of outputs they would require for a calculator to become a valuable addition to their decision making process.

Anticipated impacts

This project will result in the improved knowledge of shared use modes and new emerging transportation technology within the context of Melbourne and its local councils. It is anticipated that local councils could use the calculator and the emission framework for some of the following decision making processes:

- planning and developing a low carbon mobility network
- develop local policies
- benchmark proposals, and prioritise funding

Further information

For further information about this project, please send an email the contacts below, or access the CRC LCL website at www.lowcarbonlivingcrc.com.au

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