Planning and Transport Research Centre (PATREC)

EXECUTIVE SUMMARY

Factors Affecting Travel Behaviour Choice

Project No	Project 2
Authors	Cath Ferguson, David Lamb, Craig Standing, Susan Standing, Brett Smith, Tim Perkins, Laura Gladstone, Jessica Crisp, Sharon Biermann
Steering Committee	Simon Grieve (DOT), Rafal Gorecki (PTA), Renlong Han (DOT), Kath Merrick (DOT)
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This project comprises of four discrete research studies, each of which plays a role in the understanding of the factors that are related to behaviour for travel. Each of these four studies has provided a report which enables readers to direct their attention to what is of most interest to them.

Part One – Literature Review and Comparison of Two Theories

Part One of this project comprised of a literature review on behaviour change theories/models that might be useful to underpin interventions to change travel behaviour choice; and the comparison of two theories. One of these theories (Theory of Reasoned Action/ Theory of Planned Behaviour - TPB) has been in use across a number of different behaviours for nearly 40 years. The second theory (Comprehensive Action Determination Model- CADM) was initially promoted around 2010 and is based on the Theory of Planned Behaviour which it extends including additional variables.

In the literature review, seven key theories were examined, their elements and uses in previous research presented. A number of the theories have strong similarities and a table is included in the Appendices to the review from which the reader can determine, the elements of each. Within the literature review, pictorial representations of several of the models provide the reader with details of how the elements are related to behaviour.

In the comparison of two theories, an online instrument was used to determine the behaviour of two discrete age groups, 18 – 25 years and 55 years plus. Participants The instrument included a number of questions that were relevant to the theory test and also provided useful quantitative and qualitative data that were required for use in the research in Part Two of this research. Part Two is detailed later in this Executive Summary.

The analysis of the two theories indicated that there was little difference between the two models. However, the contribution of habit in the CADM revealed the importance of habit to the intention to use a vehicle for completing daily tasks which was the behavioural context for the research (daily tasks were defined as going to work, shopping, school run, or any other venture outside the home). However, if habit is not included in the CADM, the two models provided similar results.

Part Two – Comparisons between two different age groups

In this part of the research two separate studies were conducted: a literature review and analysis of the online instrument that sought to consider differences between the two groups with a view to determining if separate interventions are required for different groups. The literature review was conducted with a focus on the travel behaviour of the two disparate groups: 18 to 25 year olds and 55 years plus.

The literature review focused on active travel (cycling and walking) and the use of public transport. The review reported that according to the existing literature, infrastructure was one of the main keys to increasing active travel and this should provide useful information for planners in relation to these activities.

In the second part of this research, the online instrument was analysed with a view to determining differences between the two age groups. The context of this instrument has been detailed above. The instrument also sought information on how respondents felt about congestion.

Results indicated that there were concerns about congestion, especially in the 55 years plus group, but respondents did not recognise their ownership of the concern/problem they raised with their high use of a private vehicle. Several other factors were examined in this research. Travel mode choice seemed to be dependent on a number of key variables including, safety, weather, availability, access to information about services, season of travel, travel with friend/partner and the estimated time taken to complete the journey. Respondents did report issues with the most used form of travel (by car) as this caused many to feel stressed, because of excess traffic, lack of parking, and cost of parking. Some respondents were concerned with public transport in Perth, often being impractical and unrealistic in the timeframes they had. In these instances, using public transport was not deemed as a viable option or indeed at times reliable as a number of respondents remarked on the limited bus and train networks in Perth.

Nevertheless, for some respondents using public transport caused less stress, reduced their environmental footprint and was generally seen as a cheaper option than the car. Special mention

was made of the Smartrider system in Perth and the free bus transport in the CBD, both of which were seen as good transport practice. Similar concerns to public transport were reported about active travel modes, in particular safety concerns and the general lack of infrastructure and signage for cyclist. Respondents that commented on active travel issues reported that those responsible for travel and planning policy could do much more to encourage people to walk and cycle, by highlighting the associated mental and physical health benefits of this mode of travel. In this latter case, the application of a health behaviour change model (see Part One research) might be useful.

Part Three – The Sharing Economy

The collaborative economy or sharing economy is growing at a rapid pace and is making a significant impact on business and society. It can be defined as systems that facilitate the sharing of underused assets or services, between individuals or organisations, with or without charge. The sharing economy domain is different to traditional business activities in significant but sometimes subtle ways. For example, sharing activities focus on networks, are asset light, depend on information and technology platforms, are customer centric and can provide on-demand real-time services. The transportation sector has been affected by sharing economy developments and this report aimed to take stock of the wealth of literature available and provide guidance on future growth and concerns.

Planning and transportation strategies that maximize transportation sharing, in autonomous environmentally friendly vehicles, fuelled and manufactured from non-polluting energy sources is the ideal solution presented in the literature for the future of transportation, but this is far from reality and will have to overcome many challenges on its way to fulfilment. Western Australia has a high rate of car ownership and private vehicle usage. Sharing options have the potential to reduce car ownership levels and reduce vehicle miles travelled. The range of commercial and community sharing options related to transport include car-sharing, car-pooling, ride-sharing, and bike-sharing. Fundamental change to transportation behaviour will only occur if attitudes to car ownership and self-efficacy change. Evidence suggests that people are most prepared to change transportation behaviour if it provides economic or convenience related benefits. Environmental concerns are generally less important. There is conflicting evidence on how demographics and local context affect attitudes to travel and sharing but it is apparent that local context, available transport and ease of use have the greatest effects on transportation sharing behaviour.

Freight will continue to have a major impact on road congestion as small haulage firms continue to try and compete with large companies by carrying smaller micro loads. Freight sharing apps can

make shipping more efficient for large and small freight if information is shared between multiple actors and across multiple platforms. On the other hand freight apps that allow carriers to source loads directly from shippers could turn into a cost war, akin to the taxi vs. Uber conflict, pitching large carriers against smaller operators, and social freight operators, squeezing margins and reducing labour costs. If shippers and carriers can work together and share information better load balancing would reduce congestion and shipping costs without negatively impacting on wage rates. How social freight operators, such as Uber Freight, will develop in the sharing economy is uncertain but they could add to congestion and vehicle miles travelled in the same way as car sharing services if vehicle journeys are more frequent and replace balanced load journeys.

Transportation and logistics increasingly rely on technology and technological skills but the sector reports a lack of expertise in these areas. These skills will become even more important as big data, open data, the internet of things and vehicle technology develop. Expert knowledge of the transportation domain is needed to understand how the data can be used, and pose questions that need answering. Technical knowledge and analytical skills are equally important in order to access and understand the data and implement and design transportation solutions. Sharing information across multiple domains will deliver innovative, integrated, holistic transportation solutions.

Government regulations are potential barriers to the sharing economy's penetration but are needed to protect users and the economy. Partnerships with transportation sharing firms have to be carefully considered to avoid the possibility of monopolistic activity and inequality in service provision. The sharing economy has produced different business models and will continue to evolve as technology develops and behaviour changes. These developments need to be integrated in transportation planning, balancing the need for modal choice and equality of service provision. Future research can consider people's perceptions and acceptance of the various forms of transport sharing and the readiness of the freight sector to engage in collaborative commerce.

Part Four – Technology Take-up and 2050 Travel Demand and Acceptance of Autonomous Vehicles

This futuristic work considered the intersection of technology (low and high takeup) with mobility (private and shared) and how these aspects would affect travel behaviour in the future. The second part of the work is a collaboration which is still under way. The data provided on this part of the project is therefore limited. Each of these reports is noted below.

In *Technology Take-up and 2050 Travel Demand* certain changes and uncertain potentials are detailed to provide the reader with the perspective from which the scenarios have been developed. The report considered a wide range of different aspects of life for both individuals and included a section on freight and logistics. In this regard, its content is important for a number of different professionals who play a role in the planning of future transport needs.

Autonomous vehicles are becoming a clear part of the future with trials occurring across Australia (including Perth). A key to their acceptance by a majority of individuals is to understand what makes them acceptable or not acceptable. Such understanding enables the development of appropriate interventions to support increased usage. The work undertaken in this regard included a number of aspects of the sharing economy and the use of autonomous vehicles and linked that to personality attributes of drivers/owners of vehicles. The intention in this research is to develop latent class models that will support an understanding of the decisions made by individuals. Preliminary analyses suggest that personality profiles may underlie the propensity to share.