

**TPTM6300**  
**Research Project**  
**Semester 2                      2011**

## **Potential Research Topics**

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### **1. Introduction**

This document provides a list of potential research topics that have been suggested by academics at ITLS. However, students who wish to enrol in TPTM6300 may pursue alternative research topics with the permission of an academic who is prepared to act as supervisor and the Unit of Study Coordinator Dr Geoffrey Clifton ([geoffrey.clifton@sydney.edu.au](mailto:geoffrey.clifton@sydney.edu.au)). This document should be read in conjunction with the Unit of Study Outline which is available on the ITLS website: ([http://sydney.edu.au/business/itls/courses/transport\\_and\\_logistics](http://sydney.edu.au/business/itls/courses/transport_and_logistics)).

### **2. Topics**

Topics are arranged by supervisor. Students who are interested in a particular topic should contact the supervisor in the first instance.

#### **2.1. Professor David Hensher ([david.hensher@sydney.edu.au](mailto:david.hensher@sydney.edu.au))**

- **Crowding.** There is a very limited literature on crowding associated with PT. "...the construct of crowding is difficult to conceptualise and measure." We need to undertake qualitative research alongside a literature review to provided insights into the various meanings of crowding associated with public transport and the role it might play in impacting on the value of travel time savings given that standing in a train or on a bus is far less pleasant that sitting and gets worse as the trip length increases. Key issues to be investigated through qualitative research include what: (i) defines the base level of crowding, (ii) is the smallest incremental change in crowding that respondents can distinguish, and (iii) impact does rolling stock/bus configuration have on perceptions of crowding. Research suggests distinguishing between seat occupancy (e.g., 25% to 100%), standing (e.g., 0, up to X persons, etc.) and physical thresholds (e.g., free available space). The research will investigate different ways in which crowding, reliability and travel time interact.

#### **2.2. Professor Corinne Mulley ([corinne.mulley@sydney.edu.au](mailto:corinne.mulley@sydney.edu.au))**

- **Does a public transport user walk further for a more frequent bus service?** This project will look at the evidence in Sydney for the contention that passengers will walk further to a more frequent bus service. The project will build on recent research by Professor Mulley and Dr Daniels using data from the Bureau of Transport Statistics' Household Travel Survey to relate the distance walked to access a bus service to the frequency of service. This topic could also include the design and implementation of a survey of bus users, depending on the scope agreed with the supervisor.
- **Regularity of public transport travel.** Using 3 waves of GPS data each collected for 1 week of travel from the Adelaide TravelSmart evaluation, the student will investigate the regularity of public transport travel. Research questions include establishing the frequency of public transport use over a week at the individual and household level. The student will identify individuals and households as no, low and high public transport users, and investigate how this changes over the 3 waves.

- **Understanding bus users in Sutherland Shire.** This project will work with Veolia Transport to understand the market for flexible transport services in the peninsulas of Sutherland Shire, which are difficult to serve with regular scheduled bus services. The student will survey current bus users in the area to understand their preferences for travel and potential support for alternative ways to deliver bus services.
- **Travel at Rouse Hill.** Rouse Hill Town Centre in north-west Sydney has an innovative travel demand management program to encourage workers, shoppers and residents to use sustainable transport. There are a number of opportunities to work with the centre's Travel Planning Co-ordinator on surveys of travel behaviour, public transport, car pooling and related topics. This topic would be supervised by Professor Corinne Mulley and Dr Rhonda Daniels.

### 2.3. Professor Peter Stopher ([peter.stopher@sydney.edu.au](mailto:peter.stopher@sydney.edu.au))

- **Route choice behaviour.** ITLS has amassed a substantial amount of data on people's travel, recorded by GPS devices, which reveals the routes people choose to travel to their destinations. In this project, a student will take a sample of GPS travel records and will determine the minimum travel time path for each trip in the record and compare these paths to the actual paths used.
- **Investigation of tours.** Using the National Household Travel Survey from the US for 2001, and tour data developed from this by ITLS staff, this project involves investigating the relationship between the number and type of tours undertaken and the characteristics of the household and person.
- **Detailed analysis of trip purpose.** ITLS is refining software procedures to identify purpose of travel from GPS records, land use, and other characteristics. In this project, a student will undertake a detailed analysis of a small sample of GPS records to determine trip purpose, using all available information from the GPS and the household and person records. The results of this analysis will then be compared with self-report trip purposes and the outputs of the current software to determine how the software can be improved.
- **Detailed analysis of mode of travel.** Similar to the previous project, this project will involve a detailed analysis of GPS records to determine the probable mode of travel, using such information as the actual route of travel, the nature of the travel (speed, acceleration, deceleration, stops, etc.), person and household characteristics (car ownership, bicycle ownership, age, etc.) and any other appropriate characteristics. Again, results will be compared to the outputs of the current software and also to self report diaries and prompted recall results, and conclusions drawn as to how to improve the identification of mode of travel.
- **Investigation of the Stability of Daily Travel Time Expenditures.** The student will draw a small sample of respondents from the three waves of the South Australia GPS data and possibly from the next three waves of the Long-Term Monitoring data, where the same person appears in each or most waves. From these individuals, the student will determine the amount of time spent travelling each day, by day of week, and average for each of all days, week days, and weekend days. The student will then determine if there is evidence of stability or any trend in the averages and will draw appropriate conclusions from this. This work will require careful preliminary cleaning of the data and reprocessing of the data using the latest G-TO-MAP software developed by ITLS.
- **Investigation of the stability of Daily Travel Cost Expenditures.** The student will draw a small sample of respondents from the three waves of the South Australia GPS data and possibly from the next three waves of the Long-Term Monitoring data, where the same person appears in each or most waves. The student will estimate the costs of all travel undertaken by each individual in the sample, by assigning appropriate costs per kilometre for car travel, together with any other costs of car travel, bus and tram fares, and any other relevant costs. The student will report average costs of travel by day, weekday, weekend day, and by year and determine if there is stability in expenditure by day or any clear trend in expenditures. This work will require careful preliminary cleaning of the data and reprocessing of the data using the latest G-TO-MAP software developed by ITLS.

**2.4. Professor John Stanley** ([john.stanley@sydney.edu.au](mailto:john.stanley@sydney.edu.au))

- **Mobility and social inclusion.** The ability to access people, jobs, education, leisure opportunities and various services is an important contributor to how well people can participate in our society. These opportunities are not distributed equally across the community, some people being at particular risk of social exclusion. This topic would look at which types of people/areas are most at risk and consider opportunities for improving mobility opportunities that will reduce risk. It can include such issues as how to evaluate the merits of such schemes, against transport initiatives that provide benefits for more mainstream travellers.

**2.5. Professor David Walters** ([david.walters@sydney.edu.au](mailto:david.walters@sydney.edu.au))

- **An Investigation of the Value Chain for Electric Vehicles.** As new markets emerge developing the supporting logistics and supply chain infrastructure becomes a critical task. The Electric Vehicle (EV) is both an emerging market and an emerging industry. The EV has a very different specification to existing internal combustion powered vehicles and consequently if it is to be successful a whole new industry is required providing component and assembly facilities. The current developments in distribution suggest that the EV will be sold through existing distribution networks. However the EV will require a separate service infrastructure that provides replacement batteries and battery recharging facilities; there are also questions concerning home-recharging to be answered. Current information suggests that the majority of car users do not exceed 150 kilometers per day and this information gives some guide as to service facilities required.

It will explore the likely structure of the emerging market in Australia. Australia has a number of capable organisations that could play significant roles in the manufacture of the EV automotive units as well as the service support infrastructure and these will be identified and evaluated to assess their potential roles.

**2.6. Associate Professor Stephen Greaves** ([stephen.greaves@sydney.edu.au](mailto:stephen.greaves@sydney.edu.au))

- **Changing Driving Behaviour Using Financial Incentives.** This project will involve analysis of a before-and-after study of driving behaviour in which motorists received financial incentives to encourage safer driving behaviour (reduced kilometres, speeding). This will suit a student interested in driving behaviour (and what we can do to improve it) who is comfortable manipulating large data sets and has statistical skills commensurate with those covered in Analysis Tools.
- **Analysing Carbon Reduction Strategies for Aviation in Australia.** This project will involve the use of the TNIP carbon counter software (freely available) to analyse a range of mitigation strategies for reducing the carbon footprint of aviation in Australia. This will suit a student with an interest in aviation & climate change, who is comfortable with software and has good analytical skills commensurate with those covered in Analysis Tools.
- **Using GPS Data to Measure Physical Activity While Cycling.** This project will involve combining a small GPS device and state-of-the-art bicycle computer that measures physical activity to develop algorithms that translate the GPS data into measures of physical activity while cycling. This project will suit a student who is (preferably) a cyclist and/or keen on cycling who enjoys new technologies and has good data manipulation skills. Assistance will be provided to the student for any programming requirements related to the project.

**2.7. Associate Professor Peter Lok** ([peter.lok@sydney.edu.au](mailto:peter.lok@sydney.edu.au))

- **The critical success factors in a network alliance approach to sustain value chain management and high performance in Australia.** This project will involve identifying the relative value contribution of key success factors in a network alliance model. A quantitative survey method will be used to establish the critical success factors and their importance in a particular industry in Australia. Students will focus on a particular industry in Australia of their choice and senior management in these firms will be invited to participate in this study.

**2.8. Dr Ada S.F. Ng** ([suk.ng@sydney.edu.au](mailto:suk.ng@sydney.edu.au))

- **Current practices and difficulties in global empty container repositioning.** This research aims at understand the challenges that shipping lines are facing and the actions being taken out regarding global empty container repositioning in Sydney. Since the empty container repositioning issue not only affects shipping lines, but also transferred to shippers. Therefore, shippers' willingness to contribution in solving the issue will also be investigated. The result can help shipping lines and shippers in developing effective collaboration strategies in solving the problem, and hence improving the logistics efficiency of global supply chains. The student has to design and conduct the survey and interviews with shippers and shipping lines. Data collected will be analysed and a report should be provided at the end of the semester.

**2.9. Dr Geoffrey Clifton** ([geoffrey.clifton@sydney.edu.au](mailto:geoffrey.clifton@sydney.edu.au))

- **Investigation of optimal boundaries for a freight low emissions zone in Sydney (and how these boundaries may vary with respect to the severity of restrictions).** Sydney could potentially benefit from establishing one or more low emissions zones (LEZs), which are areas within which vehicle access is restricted to vehicles that meet a particular emissions standard, to lower the environmental impacts of freight traffic in an area. A project in this area would involve: (1) examining the goals and components of LEZ systems in London and Milan; (2) analysing information on freight traffic in Sydney; and (3) using this evidence to propose one or more particular LEZs for Sydney, taking into account that the appropriate boundaries may vary depending upon the severity of the restrictions governing the zones.
- **Investigation of optimal spatial boundaries for a road pricing system in Sydney (and how these boundaries may vary with respect to charging levels).** Specifying an effective road pricing system requires an understanding of where the system would best be established. A project in this area would involve: (1) examining the spatial boundaries of road pricing systems in London, Stockholm, Singapore and, should an area-wide charge be considered, The Netherlands; (2) analysing information on traffic demand in Sydney; and (3) using this evidence to propose optimal boundaries for a Sydney road pricing system, taking into account that the appropriate boundaries may vary with respect to the pricing structure in the system.