MONASH University

Public Transport Research Group

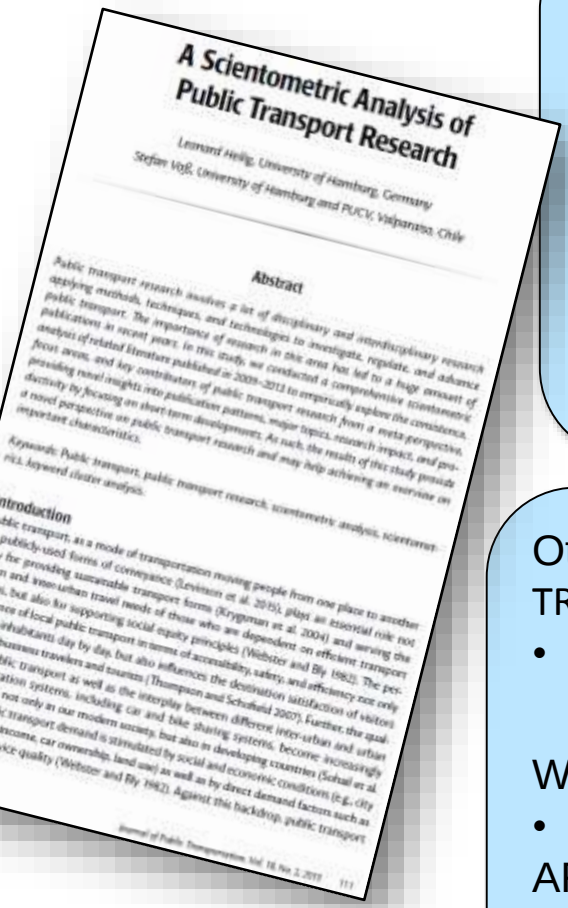
PTRG PUBLIC TRANSPORT RESEARCH GROUP

Prof Graham Currie FTSE,
Director Public Transport Research Group
Director SEPT-GRIP
Monash University, Australia
March 2019

PTRG PUBLIC TRANSPORT RESEARCH GROUP

GROUP OF EIGHT AUSTRALIA


PTRG PUBLIC TRANSPORT RESEARCH GROUP
MONASH University
CONNECTING CITIES
PTRG is the name for researchers at Monash University who are engaged in research on public transport systems, users, planning and policy.
DISCOVER MORE



A Scientometric Analysis of Public Transport Research

Leonard Heilig, University of Hamburg, Germany
Stefan Voß, University of Hamburg and PUCV, Valparaíso, Chile

Abstract

Public transport research involves a lot of disciplinary and interdisciplinary research applying methods, techniques, and technologies to investigate, regulate, and advance public transport. The importance of research in this area has led to a huge amount of publications in recent years. In this study, we conducted a comprehensive scientometric analysis of related literature published in 2009–2013 to empirically explore the consistency, focus areas, and key contributors of public transport research from a meta-perspective, providing novel insights into publication patterns, major topics, research impact, and productivity by focusing on short-term developments. As such, the results of the study provide a novel perspective on public transport research and may help achieving an overview on important characteristics.

Keywords: Public transport, public transport research, scientometric analysis, scientometrics, keyword cluster analysis.

Introduction

blic transport, as a mode of transportation moving people from one place to another publicly-used forms of conveyance (Levinson et al. 2010), plays an essential role not for providing sustainable transport forms (Krygsman et al. 2004) and serving the n and inner-urban travel needs of those who are dependent on efficient transport , but also for supporting social equity principles (Webster and Bly 1982). The per- ce of local public transport in terms of accessibility, safety, and efficiency not only inhabitants day by day, but also influences the destination satisfaction of visitors usiness travelers and tourists (Thompson and Schuffield 2007). Further, the qual- blic transport as well as the interplay between different inter-urban and urban not only in our modern society, but also in developing countries (Suhail et al. c transport demand is stimulated by social and economic conditions (e.g., city come, car ownership, land use) as well as by direct demand factors such as ce quality (Webster and Bly 1982). Against this backdrop, public transport

Journal of Public Transportation, Vol. 18, No. 2, 2015 111

World Review of Public Transport Research (2009-2013)

Heilig L and Vos S (2015) 'A Scientometric Analysis of Public Transport Research' Journal of Public Transportation Vol 18 No 2

Top 3 world Universities in Public Transport Research

- Uni of Toronto, UCal Berkeley, MONASH UNIVERSITY

Most Productive Authors (World Ranking)

- PTRG Staff - Graham Currie 2nd, Alexa Delbosc 11th
- PTRG Associates – Avi Ceder 3rd, John Nelson 10th

Most Cited World Authors

- Graham Currie 5th

Other International Awards

TRB Largest Transport Conference in the World (13,000 delegates)

- Best Paper in Public Transport
  - 2012
  - 2017

World Conference on Transport Research

- Best research paper in Transport Policy 2016

ARRB Transport Research

- Research Impact Award 2017

PTRG is part of a wider collaborative framework in transport research across multiple groups/ faculties

Key Research Groups

PTRG PUBLIC TRANSPORT RESEARCH GROUP

Institute of Transport Studies
ITS (Monash)

IRT Institute of Railway Technology

MADA
MONASH ART DESIGN & ARCHITECTURE

Key Research Themes

- Railway Engineering & Technology
- Public Transport Policy & Operations
- Traffic & Transport Systems
- Intelligent Transport Systems
- Design in Public Transport
- Model Data Fusion
- Light Weight Vehicles
- Aerodynamics
- Transport Safety

Key staff, the associate team & students

Prof Graham Currie
Chair of Public Transport

Nicholas Fournier
Research Fellow

Dr Alexa Delbosc
Senior Lecturer
DECRA Fellow

James Reynolds
Research Fellow

Katerina Pavkova
Research Fellow

Wendy Walker
Website Manager

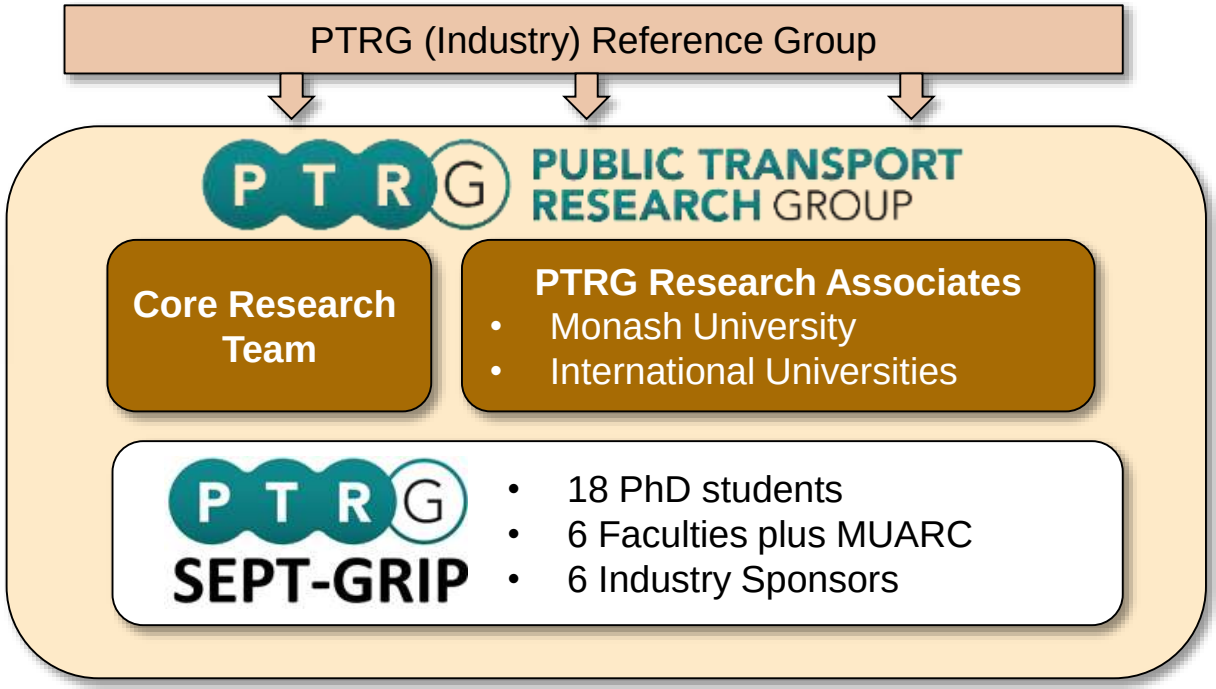
Dr Farhana Naznin
Research Fellow

- 27 PhD students
- 52 Research associates across Monash University (e.g. ITS, MADA, MUARC), International Universities, and external experts
- 48 Masters Students; most in China
- 10+ final year civil engineering undergraduate research students per year

Laura McCarthy
Research Fellow

Dr Kun An
Lecturer

Rebadged in 2015 as the TFV-Monash Public Transport Research Group (PTRG)



TRANSPORT FOR VICTORIA

PUBLIC TRANSPORT VICTORIA PT

- **World First joint Authority/Uni. Research and Training Initiative**
- **Starts March 1st 2015 for 5 years; then continues subject to review**
- **$5M total funding - $ 2.5M PTV seed funding provided, $2M Monash $0.5M Industry**

Its aim is “to enhance PTV’s Planning and Management Using Applied Research and Training” through:

- University Research
- Contract Research
- Joint PTV/Monash Research
- Training/Masterclass Programs
- Public Engagement

Topic focus is highly varied and inter-disciplinary:

PTRG PUBLIC TRANSPORT RESEARCH GROUP

- Rail Maintenance & Service Reliability
- Timetable Synchronisation
- Social Changes and Travel
- ICT-Social Media & Pax Information
- Ridership Drivers
- Regulation Management
- Infrastructure Funding, Design, Management
- Industry Best Practices
- Best Practice Transit Authorities
- Understanding/ Improving Customer Experiences
- Improving Planning Methods
- Integrated Planning & Marketing
- System Design & Users Experience
- Managing Overcrowding
- Reliability Management
- Big Data Methods
- Tourism & Public Transport

OECD (ITF) Review – world practice in private sector involvement in Public Transport

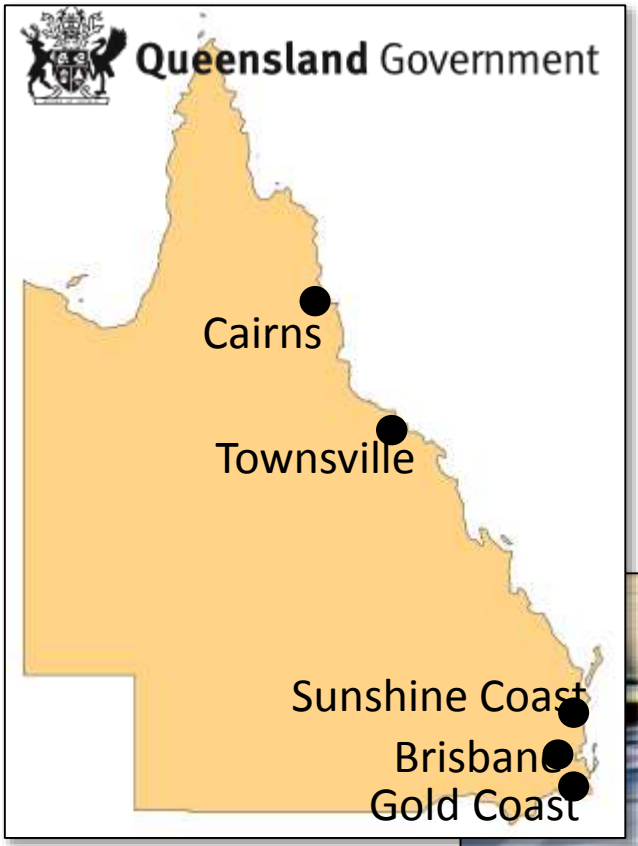
Research Program

- Part of the International Transport Forum international research program:
  - Public Transport Market Organisation and Innovation
- Includes researchers from:
  - Australia, Japan, Korea, Chile France, UK, Denmark, Sweden, Netherlands, Spain, Russia, India and Mexico

Benchmarking how urban PT can better cater for international tourists

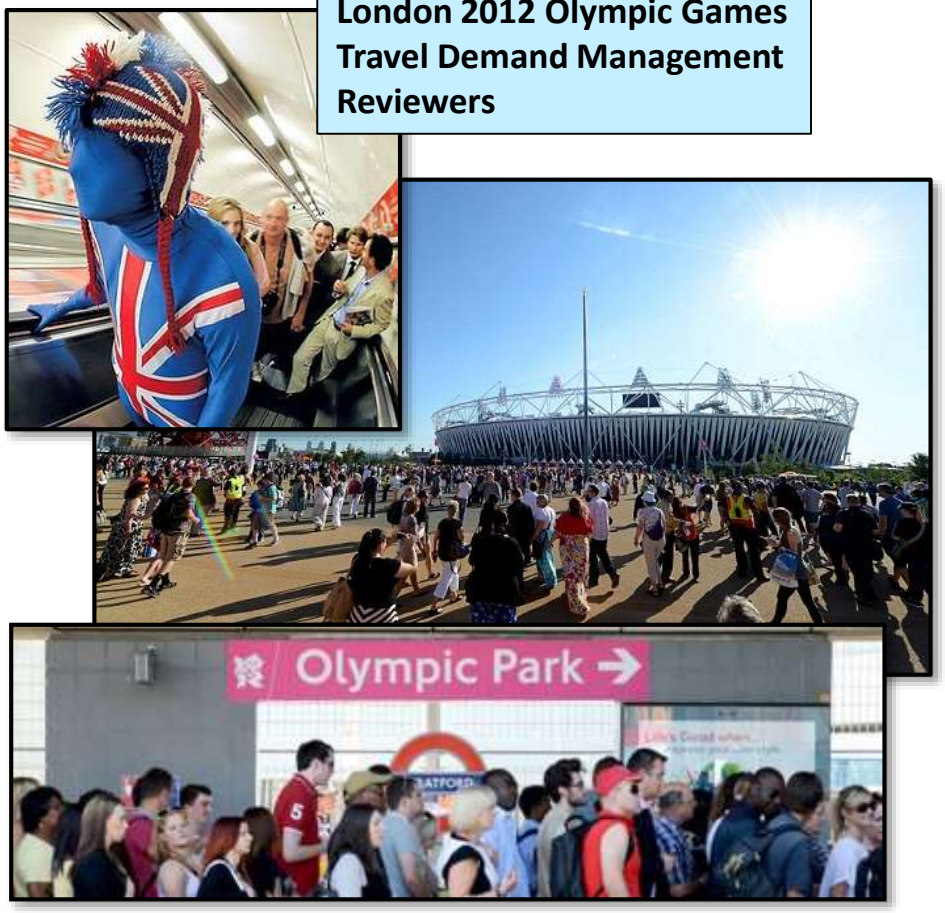
- A. Information
- B. Cost/Ticket
- C. Service Level
- D. Special Service

London
Paris
Melbourne
Singapore

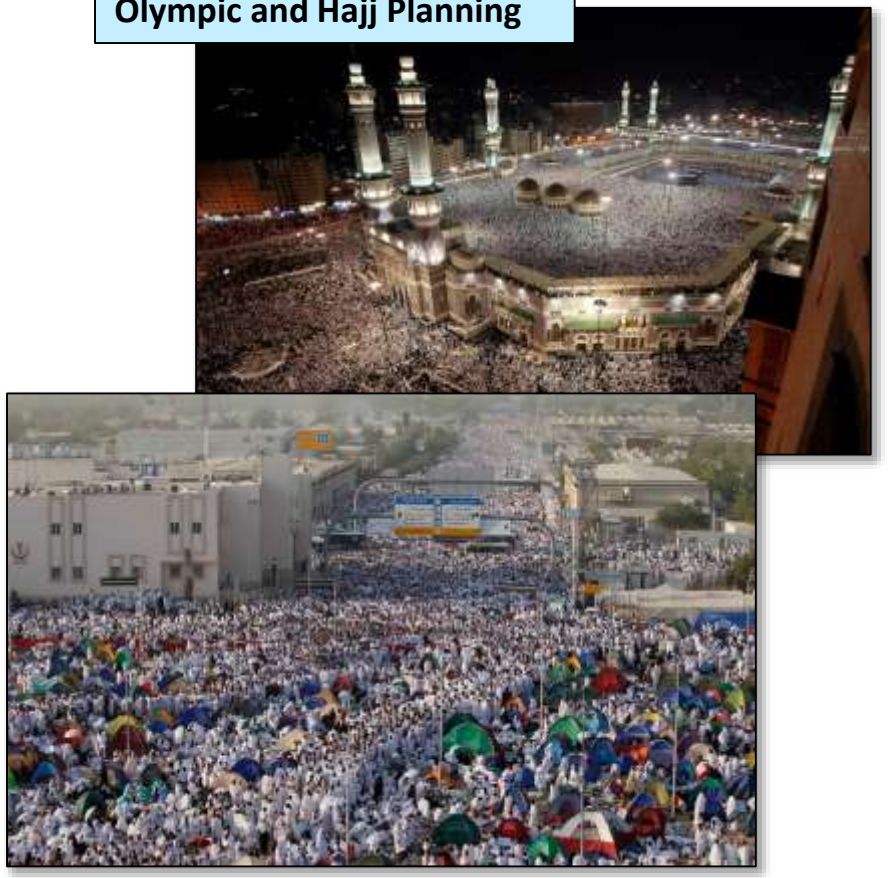


PTRG special event planning and research

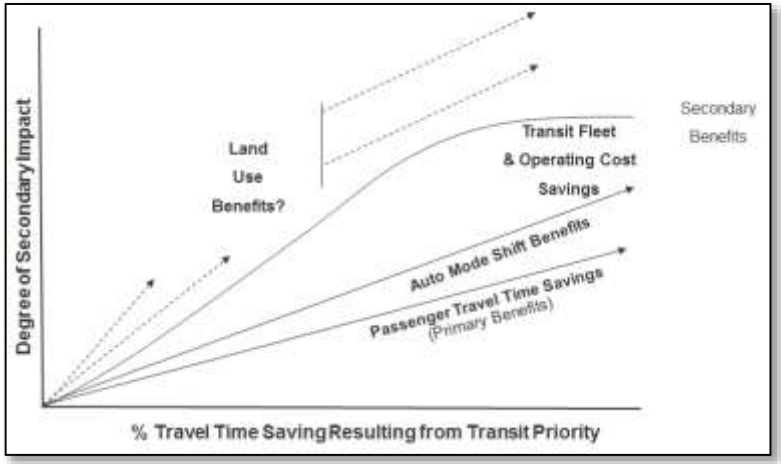
London 2012 Olympic Games Travel Demand Management Reviewers

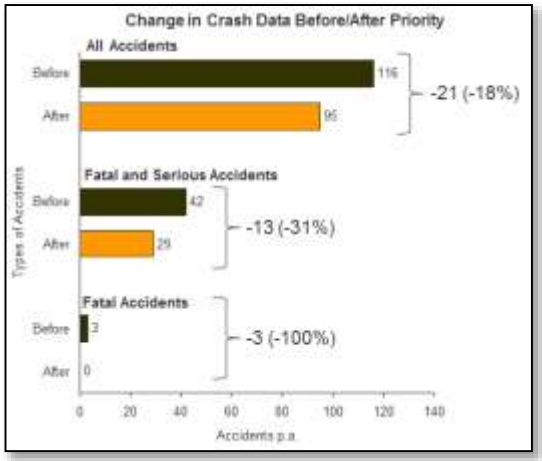


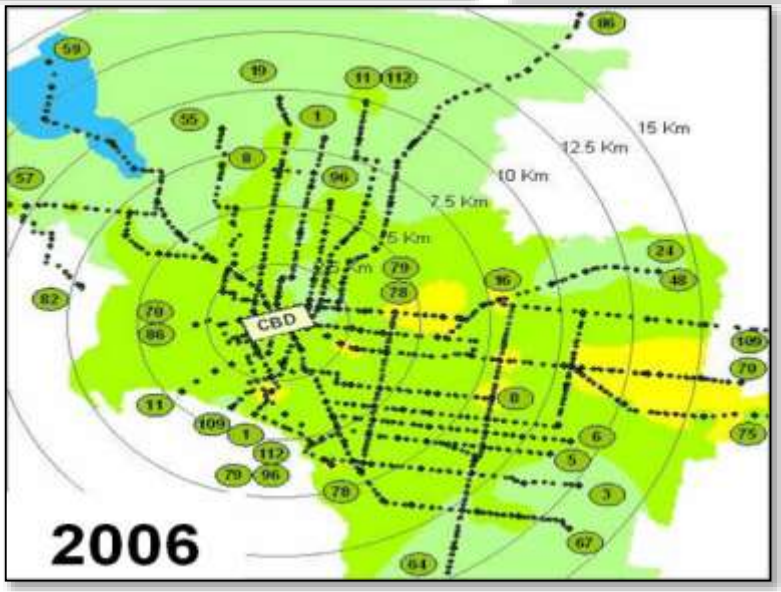
Mecca – Hajj/Umrah Events Synthesis of Lessons from Olympic and Hajj Planning



Optimising design for PT Priority

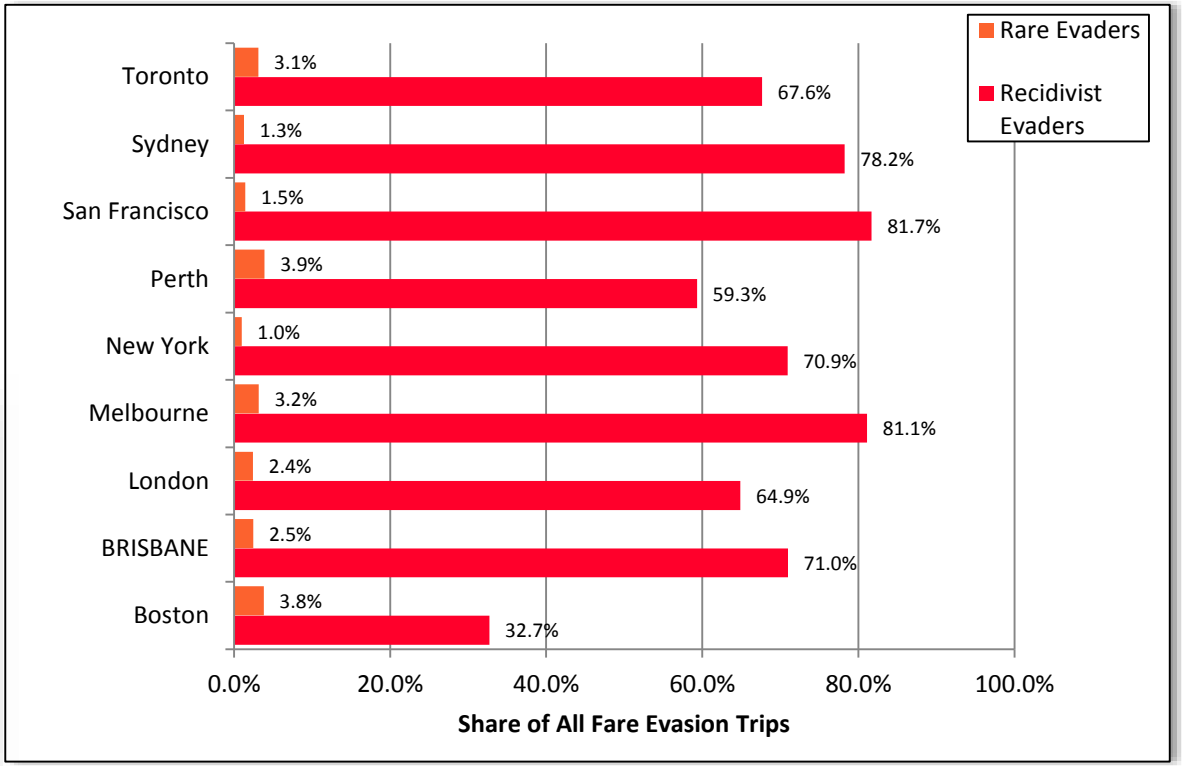






Example Projects: Understanding the Psychology of Fare Evasion Behaviour

IMPACT – Over $105mp.a. in savings in Australia ; much larger in overseas cities

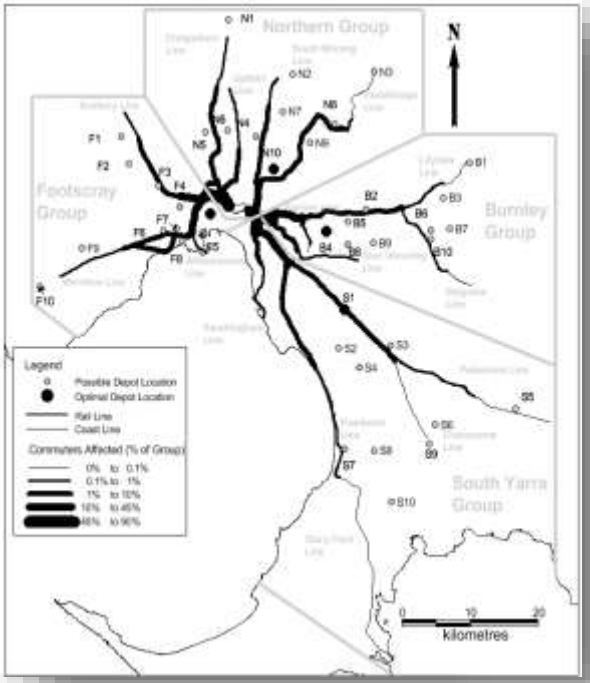


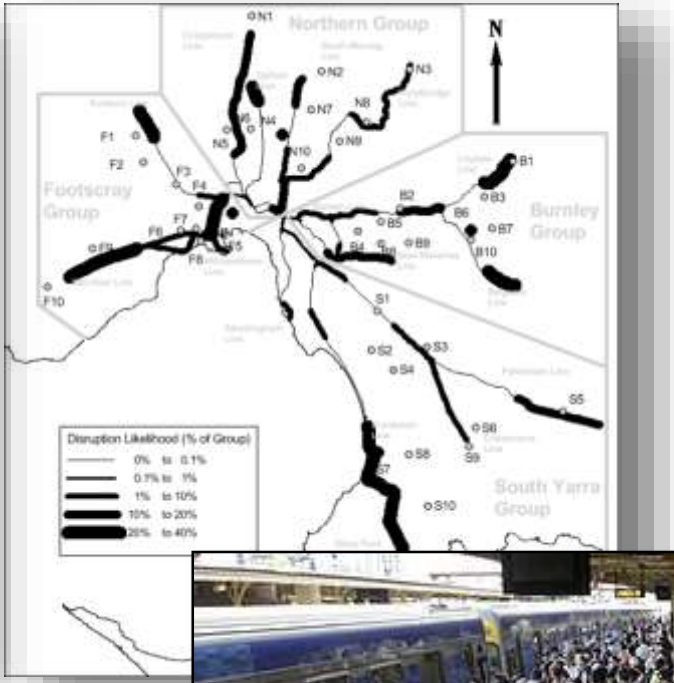
IMPACT - Large improvement in revenue protection ~$105M savings in Melbourne and Sydney since 2015 EVERY YEAR ; more reductions internationally

Research Awards:

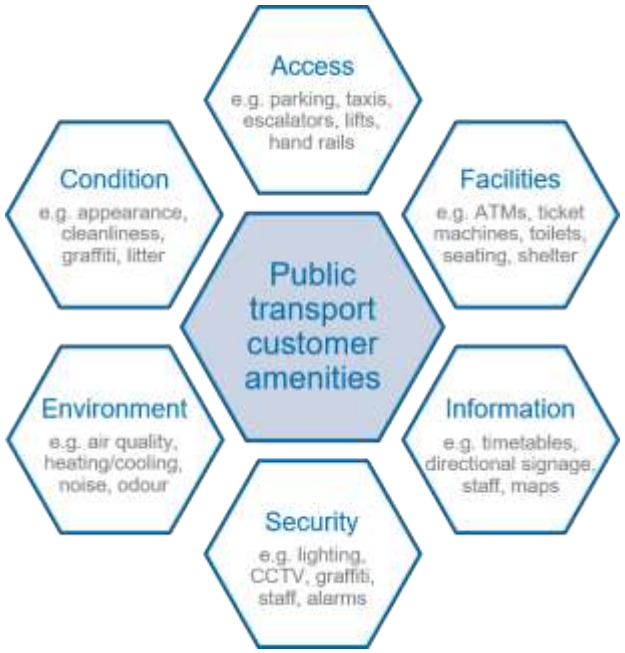
- **2016 - Best Research Paper – World Conference on Transport Research**
- **2017 - ARRB Inaugural Research Impact Award**
- **2017 - Vice Chancellors Award for Research Impact**

International Study of Rail Disruption Management





Current major research program – International Review of Approaches to Valuing Customer Experience Infrastructure in Project Appraisals



Key aims of the research program:

- Review **evidence** on measured values with regard to public transport customer experience initiatives
- Understand **current practices** in the use and adoption of these methods in Australia and internationally in public transport
- Understand what **can and cannot be measured** in terms of customer experience initiatives
- Explore **methods** used to measure amenity/soft factor values, their pros and cons and what is considered **good practice**

Program Tasks

1. Research Literature Review
   - Review of published evidence on values and methodologies
   - Types of amenities valued, range of approaches used, locations applied
2. World Transit Industry Practice Review
   - Survey of public transport agencies in Australia and major world cities
   - Current practices towards valuation and application of existing values
3. International Practitioner Delphi Survey
   - Survey of 20-30 experts worldwide (consultants, academics, government)
   - Methods and best practices towards valuation of customer amenities

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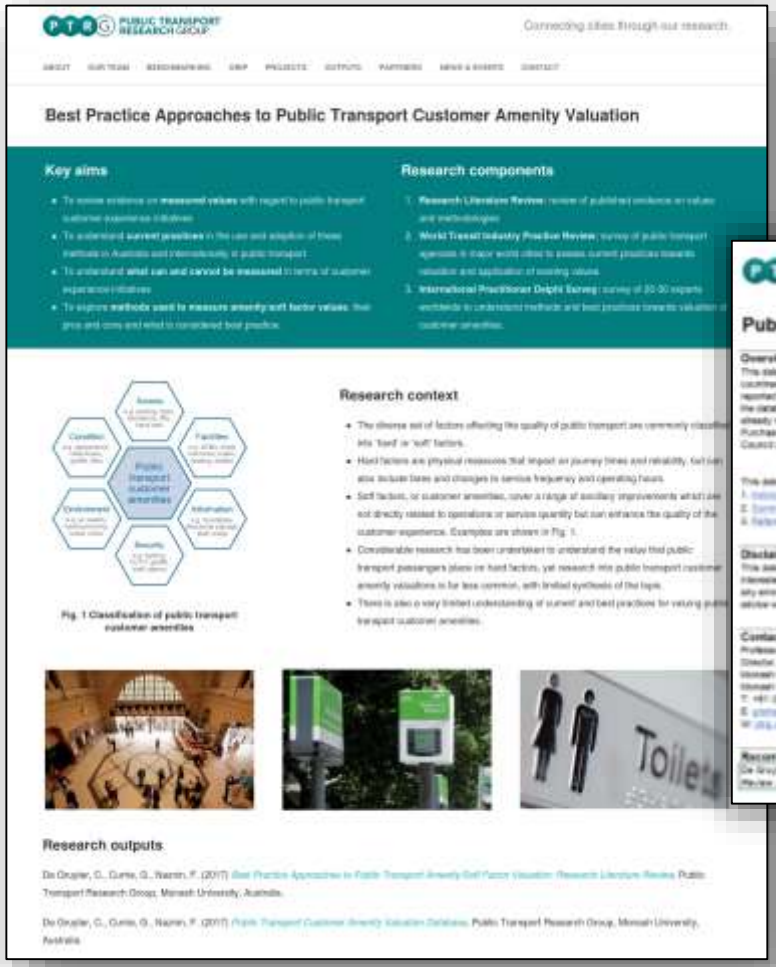
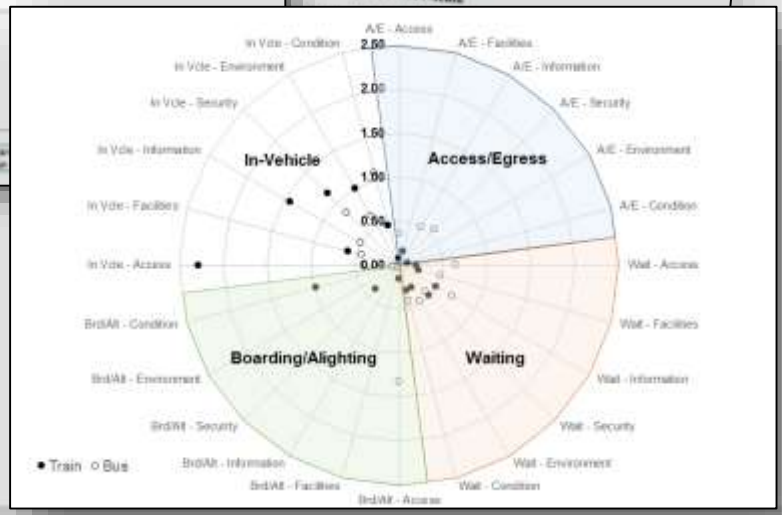
Current major research program – International Review of Approaches to Valuing Customer Experience Infrastructure in Project Appraisals

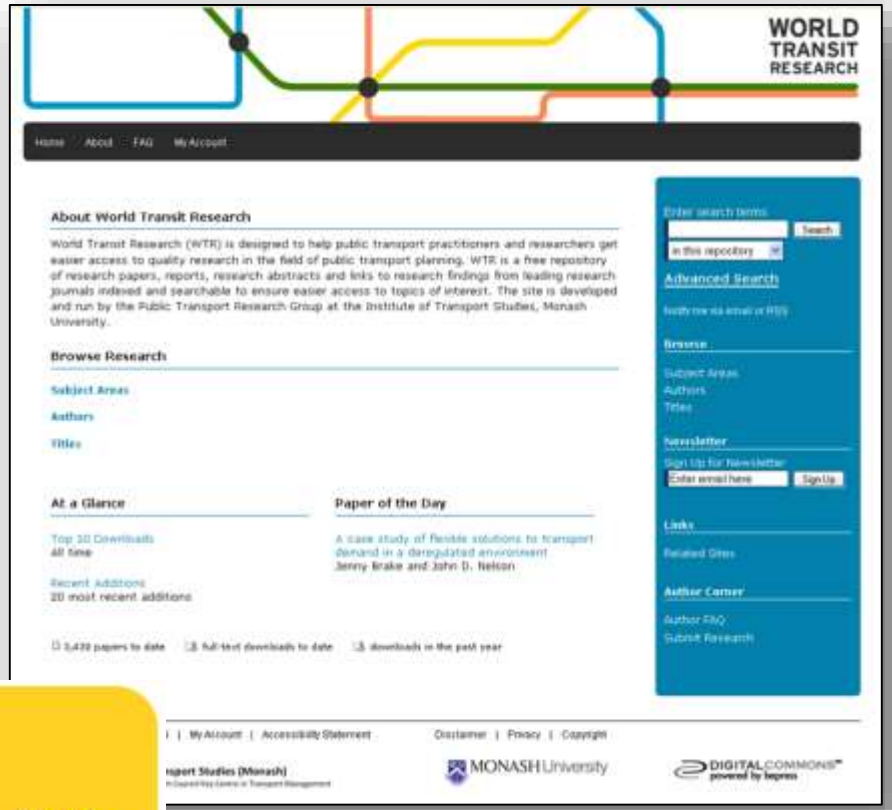
See: PTRG.info





Source: De Gruyter, C, Currie, G, Truong, LT & Naznin, F 2018, 'A meta-analysis and synthesis of public transport customer amenity valuation research', **Transport Reviews**, pp. 1-23

PTRG runs World Transit Research; the global research clearinghouse for public transport research



World Transit Research

- Commenced 2010
- 256,639 site users
- 8,000 towns and cities from 170 countries
- 6,896 journal papers
- World index of authors and topics

2025=PTx2

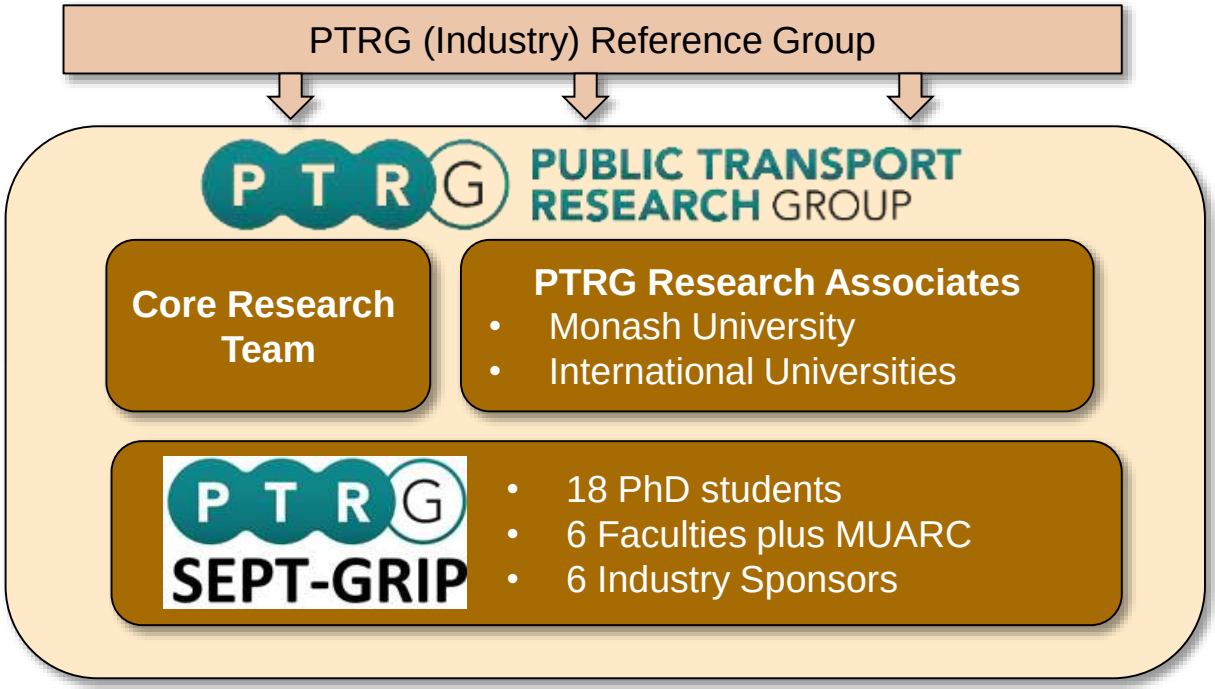
UITP Showcase Award Winner

www.worldtransitresearch.info

Industry Training in Public Transportation, Europe, Asia, North America and Australasia

https://www.monash.edu/engineering/its/public-transport-short-course

SEPT-GRIP is an initiative of the Public Transport Research Group (PTRG) at Monash and TfV/PTV



TRANSPORT FOR VICTORIA

PUBLIC TRANSPORT VICTORIA PT

It has 18 research topics…

1. TOD & Transit
Laura Aston

2. Big Data & Visualisation
Homayoun Rafati

3. Network Synchronisation
Rejitha Ravindra

4. Shared Mobility
Taru Jain

5. Changing Travel Behaviour
Laura McCarthy

6. Tourism & Public Transport
Victoria Radnell

7. Reliability Engineering Approaches in Best Practice Railways
Maryam Nawaz

8. Improving Gender Diversity in the Public Transport Workforce
Rachel Mence

9. Future Train
Lisa Fu

10. Designing Urban Rail to Reduce Vandalism
Amy Killen

11. Bus & Tram Priority Implementation
James Reynolds

12. Simulating Bus & Tram Priority
Samithree Rajapaksha

13. Placemaking & Street Redesign
Matthew Diemer

14. Passenger Falls in Trams
Luke Valenza

15. Transit Network Design
Nora Estgfäller

16. Future Bus
Sarah Roberts

17. The New Bus Rider
Prudence Blake

18. Road Safety Impacts of Bus Safety Inspections
Jianrong Qiu

PTRG SEPT-GRIP

…with 6 industry partners…

1. TOD & Transit
Laura Aston

2. Big Data & Visualisation
Homayoun Rafati

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TRANSPORT FOR VICTORIA

PTRG SEPT-GRIP

9. Future Train
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METRO

vicroads

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yarra trams

transdev

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BusVic

…and 4 Research Networks ;

1. TOD & Transit
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Homayoun Rafati

3. Network Synchronisation
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PTRG SEPT-GRIP

Research Network A; Planning Implementation, Land Use and Place

1. TOD & Transit
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Research Network B; People, Behavior and Society

1. TOD & Transit
Laura Aston

2. Big Data & Visualisation
Homayoun Rafati

3. Network Synchronisation
Rejitha Ravindra

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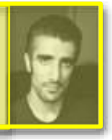
Research Network C; Data, Operations, Modelling and Analysis

1. TOD & Transit
Laura Aston

2. Big Data & Visualisation
Homayoun Rafati



3. Network Synchronisation
Rejitha Ravindra

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18. Road Safety Impacts of Bus Safety Inspections
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PTRG SEPT-GRIP

Research Network D; Design, User Experience and Safety

1. TOD & Transit
Laura Aston

2. Big Data & Visualisation
Homayoun Rafati

3. Network Synchronisation
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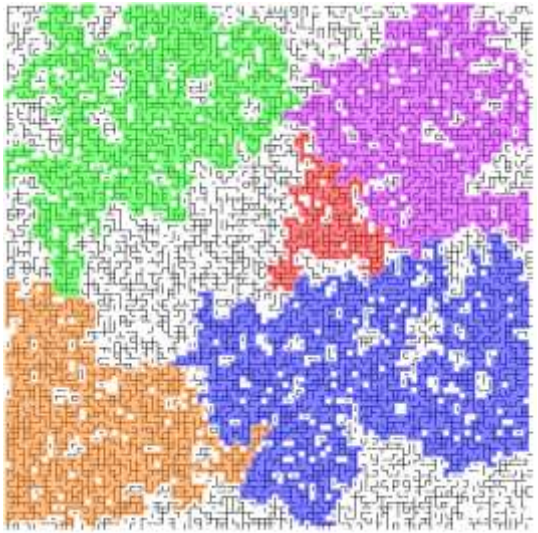
PTRG SEPT-GRIP

Example Projects – Homayoun Hamedmoghadam-Rafati – Adopting Percolation Theory with Smartcard data to understand network bottlenecks

2. Big Data & Visualisation
Homayoun Rafati

- Percolation Theory:
  - A framework to study the movement of fluids in porous material
  - Mathematical modeling of porous material with network representation
  - Performance of the system is modeled locally as permeability probability of the links



Example Projects – Homayoun Hamedmoghadam-Rafati – Adopting Percolation Theory with Smartcard data to understand network bottlenecks

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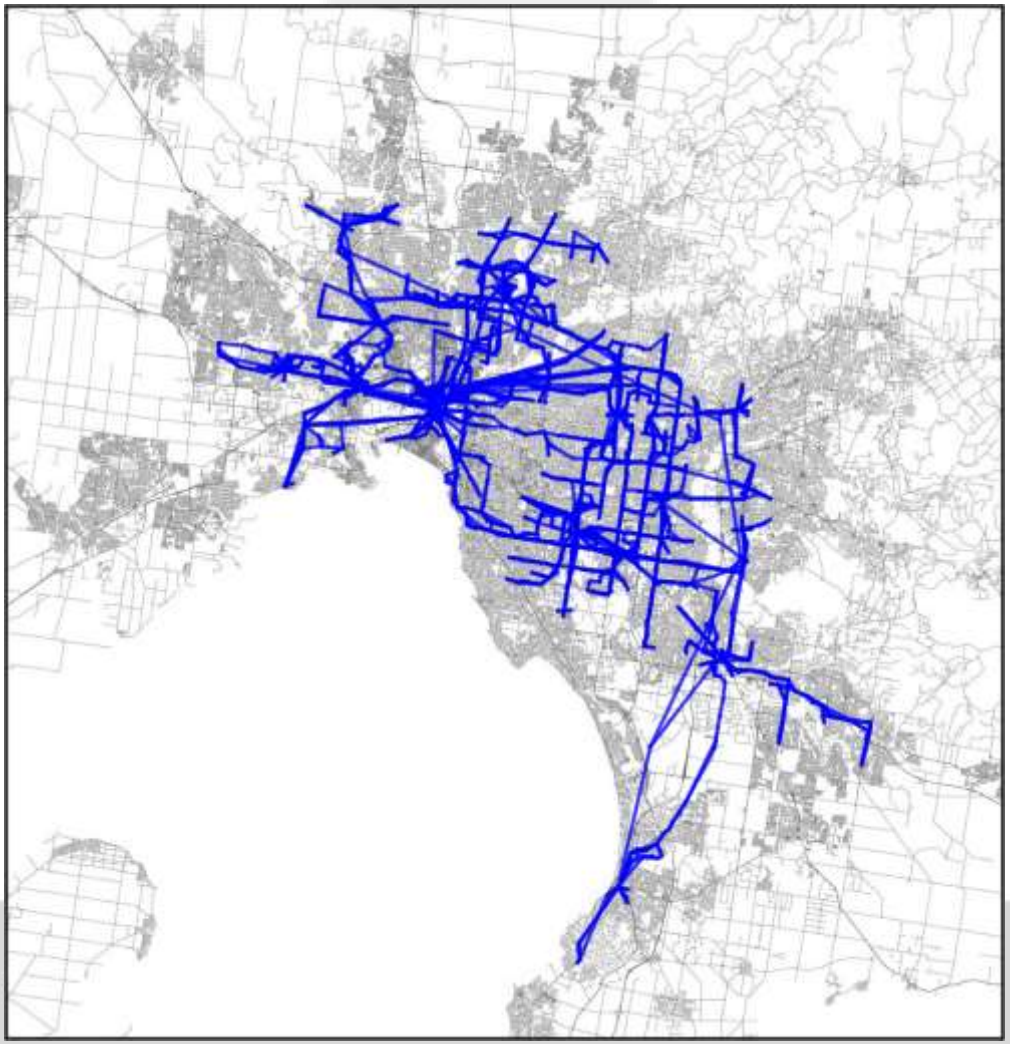
Homayoun Rafati



Percolation Simulation

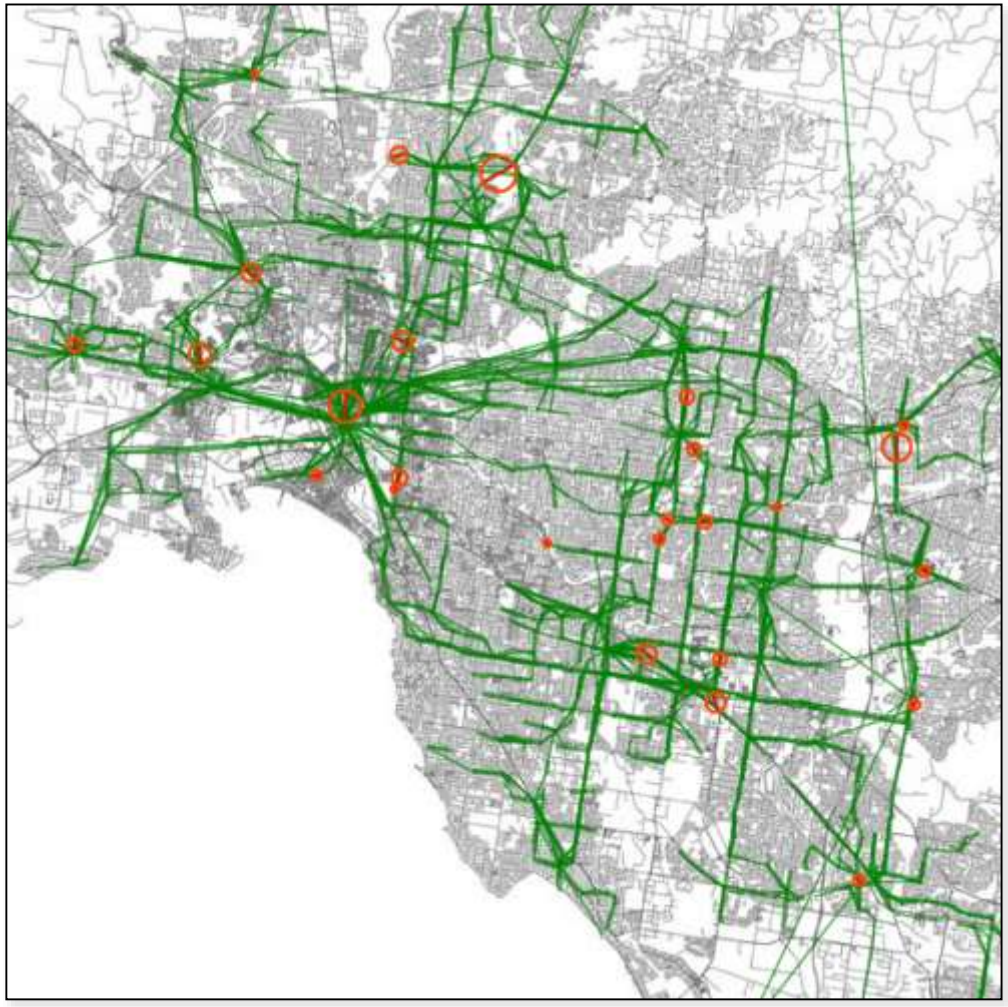
- An inverse percolation process reveals the low performing links by which the passenger flows become separated from each other and isolated from a global flow circulation.
- We introduce a measure that indicates network reliability in terms of the on-road PT network conflicts with road conditions.
- An efficient network provides more alternative routes <

Example Projects – Homayoun Hamedmoghadam-Rafati – Adopting Percolation Theory with Smartcard data to understand network bottlenecks

2. Big Data & Visualisation
Homayoun Rafati

Bottleneck Identification

- The links that bridge between the high-performance well-connected clusters of the network, act as network bottlenecks.
- We identify the bottlenecks of the network by taking into account both structure (service supply for spatial movements) and dynamics (conflict of service with road conditions) on the network.
- Global efficiency of the network is highly dependent on the performance of bottlenecks.
- We show that the reliability of the PT network is significantly improved by reducing the conflict on a small number of network bottlenecks. This can be done through different measures such as bus/tram segregation, signal priority strategies, and pedestrian crowd management.<<<



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