



PATREC

Planning and Transport Research Centre (PATREC)

ANNUAL REPORT

2015



www.patrec.uwa.edu.au



THE UNIVERSITY OF
**WESTERN
AUSTRALIA**



Curtin University



mainroads
WESTERN AUSTRALIA



Department of
Transport

CONTENTS

1	INTRODUCTION	3
1.1	Background and Focus	3
1.2	Purpose	3
1.3	Achievements in Brief	3
2	RESEARCH	4
2.1	Overview of Project Activity in 2015.....	4
2.2	Overview of Completed Projects	4
3	KNOWLEDGE TRANSFER	11
3.1	PATREC Research Forum 2015.....	11
3.2	Events.....	12
3.3	Industry Engagement.....	13
3.4	Building Capacity in WA	14
3.5	Research Outputs.....	14
4	PEOPLE AND RESOURCES.....	17
4.1	Staffing	17
4.2	Finances	18
5	GOVERNANCE	19
5.1	Advisory Board Members	19
5.2	Review of PATREC Sustainability.....	19
6	PERFORMANCE AGAINST KPIs AND TARGETS.....	21
7	APPENDIX A: PATREC RESEARCH FORUM PROGRAM.....	23

Prepared By	Professor Sharon Biermann
Date	18 August 2016
Version	Final

1 INTRODUCTION

1.1 Background and Focus

Whereas the focus of PATREC in 2012 was re-establishment at UWA, in 2013 it turned to the establishment of a research program through a stakeholder engagement process, assembly of the core research team and project initiation. 2014 was primarily about delivering a series of baseline research projects which essentially established an understanding of the current (local) situation through data collection and analysis, literature reviews to establish international trends and best practice, and a view of applicability of the best practice learning to Perth and WA. In 2015, the emphasis was on knowledge transfer, commencing and substantially completing a highly significant research project with our agency partners and a review of the operational sustainability of PATREC.

A number of substantive research projects were completed with key findings and policy implications communicated through an inaugural PATREC Research Forum together with the initiation of a PATREC book, the continued publication of a series of PATREC Perspectives, hosting of PATREC events and also academic publications. Commissioned by the Department of Transport in 2015, PATREC conducted research to produce a plan for 'mass rapid transit' for the Perth and Peel Region @ 3.5 million and beyond. This research delivered a technical report together with a number of working papers. PATREC's report was included in a high-profile public release of a suite of government documents on 29 July 2016, intended for public consultation. A review of arrangements for the continuing and sustainable operation of PATREC was undertaken during the latter part of 2015 with a view to informing the renewal of the current Collaborative Agreement which ends in April 2017.

1.2 Purpose

The primary purpose of this report is to provide an update of activities conducted in 2015 with a focus on outputs and outcomes achieved.

1.3 Achievements in Brief

- One new, large, high impact project undertaken:
 - Mass Rapid Transit for Perth & Peel @ 3.5 Million and Beyond (Mass Rapid Transit @3.5)
- Four substantive projects completed:
 - Activity Centre Accessibility
 - Activity Centres: Making Land Use and Transport Work
 - AURIN WA Data Hub
 - Stated Preference Survey – Experimental Design.
- PATREC Sustainability Review undertaken.
- More than 400 delegates attended nine PATREC seminars/events including the PATREC Research Forum.
- 18 academic publications.
- "PATREC Perspectives" series continued to communicate research findings in an accessible format, with three issues published on the PATREC website.
- One new PATREC PhD Top-up scholarship awarded for freight research.
- Dr Brett Smith and Assoc. Prof Doina Olaru (together with their research peers) awarded the inaugural Lindsay Oxlad award for best paper on Transport Modelling and Analysis at the Australasian Transport Research Forum (ATRF) 2015.
- The core financial contribution of \$420,000 from the collaborating partners leveraged additional external research funding of \$445,990.

2 RESEARCH

2.1 Overview of Project Activity in 2015

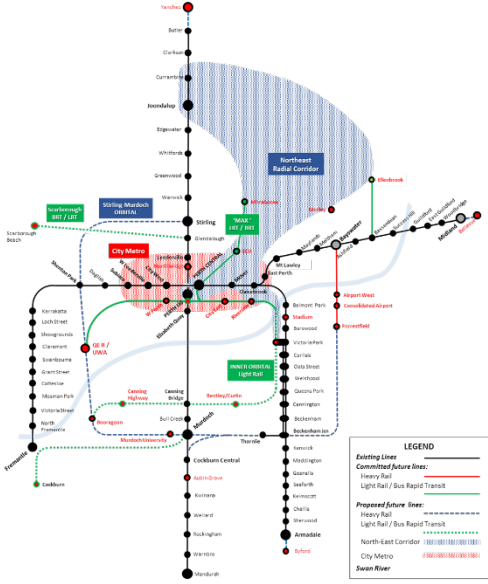
The focus of project work in 2015 was on completing six substantive projects (Activity Centres, Stated Preference, AURIN, Accessibility, Freight, Infrastructure Funding), five small (<\$7.5K each) seed projects and commencing and substantially completing the Mass Rapid Transit @3.5 research project (Table 1).

Table 1: Overview of Project Activity in 2015

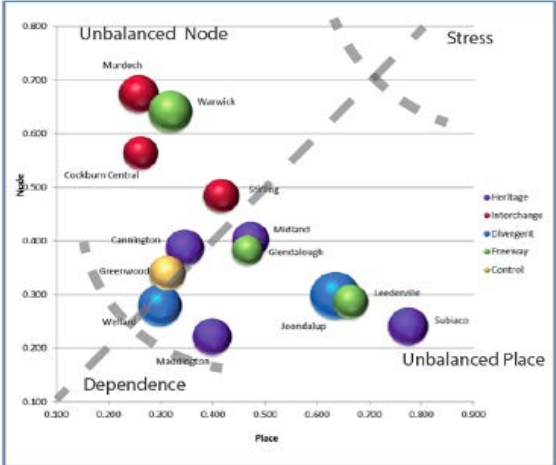
Project	Status	Funding \$
Mass Rapid Transit @3.5	Completed	\$466,600 (\$385,600 - Non-core funds: Dept of Transport; \$81,000 - Core funds)
Activity Centres: Making Land Use and Transport Work - Stations in or near freeway medians – reconciling node/place conflicts	Completed	\$185,000 (\$80,000 - Core funds; \$105,000 – Main Roads)
AURIN WA Data Hub	Completed	\$200,000 - Non-core (AURIN)
Stated Preference Survey – Experimental Design	Completed	\$68,700 – Core funds
WA Freight Studies – Stage 2	Completed	\$55,250 – Core funds
Activity Centre Accessibility	Completed	\$70,000 - Non-core (RAC)
Infrastructure Funding Research Priorities and Project Planning	Completed	\$30,000 - Core funds
Seed Projects: <ul style="list-style-type: none"> • <i>Use of Mobile Fitness Application Data to Model Bicycle Usage Patterns (\$5K)</i> • <i>Suburbs Research for Australian Cities (\$7.5K)</i> • <i>Transport Technology Futures (\$5K)</i> • <i>Travel Behaviour Change(\$4.5K)</i> • <i>Employment self-sufficiency (\$5K)</i> 	Completed	\$25,000 - Core funds

2.2 Overview of Completed Projects

Project Name	Mass Rapid Transit @3.5
Program Area	Integrated Land use–Transport Planning and Policy and Information and Modelling
Steering Committee	Adjunct Prof Fred Affleck, Adjunct Prof Stuart Hicks AO, Mr Eric Lumsden PSM (WAPC)
Research Team	Laurie Piggott, Prof Sharon Biermann, Yuchao Sun, Dr Doina Olaru, Dr Brett Smith, with support from Prof Chris Pettit, Prof Corinne Mulley, Prof Graham Currie
Duration	Commenced April 2015 – February 2016
Purpose	To research, evaluate and advise on the options for the primary mass transit network to serve the Perth and Peel metropolitan region to cater for a population of 3.5 million and beyond as set out in the documents making up the Perth Planning Framework.
Findings	A ‘sketch planning’ methodology estimated capacity-critical week-day peak-hour public transport boardings for the 3.5 million population horizon. The urban development strategy of the Western Australian Planning Commission (WAPC) for ‘Perth and Peel @ 3.5 million’, was used in estimating transit demand, but differing employment distribution scenarios were tested. A growth in all-day public transport market share from about 8% (2015) to at least 12% (@ ‘3.5 million’) was been assumed. Future MRT network development was based on recommended Hi-Trans© ‘demand-based’ principles, which seek to maximise service frequency to achieve as far as practicable ‘turn-up and go’ timetabling. Plans by the PTA for MRT network capacity enhancement until 2031 (including minimal network extensions) were the basis for network capacity estimation without significant new infrastructure.

Project Name	Mass Rapid Transit @3.5
	<p>Findings regarding additional new infrastructure included:</p> <ul style="list-style-type: none"> options for a new line serving the inner north (east of and absorbing demand which would otherwise flow to the present northern railway, which will reach practicable capacity before 3.5 million) complemented by significant addition of orbital network lines (one 'heavy' rail and one LRT) joining strategic Activity Centres an inner city Metro distributor a small number of new rail links aimed at enhancing network connectivity and improving operating resilience. <p>An important aim of proposed new orbital lines and the new MRT corridor east of the northern line is to divert peak-hour boardings from the northern MRT radial, which will reach capacity before '3.5 million'. A substantial part of the extended network would probably be built in tunnels to avoid using major road capacity needed for road traffic, and to avoid adverse effects on TOD precinct designs.</p> <p>Variations from the planned land-use densification would necessarily affect the utility of future additions to public transport infrastructure, with less densification requiring reductions in investment, and conversely greater densification providing opportunities for greater network capacity and connectivity.</p> 
Outputs	<ul style="list-style-type: none"> Final Report Seven supporting Working Papers Spreadsheet-based patronage estimator sketch model
Outcomes	<p>Launched as part of the Transport@3.5 Perth Transport Plan for 3.5 Million People and Beyond (Department of Transport, 2016) in July 2016. The Minister's foreword to the full Plan acknowledges that "Transport@3.5 Million ... is based on extensive research, knowledge, experience and predictive modelling. The mass transit network is based on independent advice from the Planning and Transport Research Centre (PATREC) led by Adjunct Professor Fred Affleck" (p1). The Summary report says, "The Planning and Transport Research Centre (PATREC) were independent advisors for the mass transit network" (p 4). The Public Transport Plan supporting report devotes a section (2.2 pp 8-9) to the Mass Transit Research Study, "undertaken by the PATREC research team consist[ing] of specialists from UWA and partner universities, with participation of personnel from the Department of Transport (DoT), Department of Planning (DoP), PTA, and Main Roads WA (MRWA)".</p> <p>At the launch event on 29 July 2016, within the first few sentences of his launch address, Minister Nalder specifically acknowledged by name the contribution of Adjunct Professor Fred Affleck and his PATREC team. The Chair was part of the high profile group who addressed the media after the launch, with subsequent coverage on the ABC, 96FM and 6PR news, and in Community Newspapers.</p>

Project Name	Activity Centres: Making Land Use and Transport Work - Stations in or near freeway medians – reconciling node/place conflicts
Program Area	Integrated Land use–Transport Planning and Policy
Steering Committee	D. Morgan (MRWA), L. Glare (DoP), L. van Aarde (DoP), O. Thomas (PTA), C. Shepherd (DoP)
Research Team	C. Babb, D. Oлару, A. Duckworth-Smith (AUDRC), R. Falconer (ARUP), R. Isted (Jacobs), S. Biermann
Independent Reviewer	Prof David Gordon, Queens University, Canada
Duration	September 2014 – September 2015
Purpose	<p>In order to inform decisions regarding the co-location of new freeways, rail lines/stations and activity centres and also strategies to improve land use and transport outcomes in existing settings, the aim of this study was to:</p> <ul style="list-style-type: none"> understand the particular set of land use and transport issues and impacts unique to activity centres located in or in close proximity to rail stations situated in freeway medians in relation to Node and Place performance in Perth; assess the applicability of comparable national and international best practice in resolving the

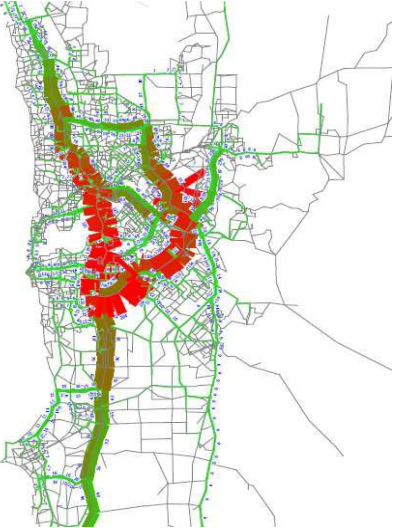
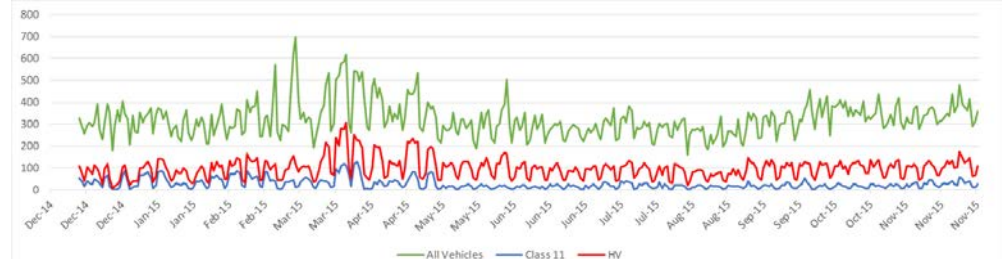
Project Name	Activity Centres: Making Land Use and Transport Work - Stations in or near freeway medians – reconciling node/place conflicts
	<p>conflict between Node and Place; and</p> <ul style="list-style-type: none"> provide a range of options for enhanced performance of existing and future settings. <p>Research questions:</p> <ul style="list-style-type: none"> How can land use and transport performance be improved in current station precincts in Perth? In future, should we align passenger rail in freeway medians?
Findings	<p>A multi-criteria evaluation analysis of 13 stations precincts in terms of 43 criteria, broadly using Chorus and Bertolini's (2011) node/place conceptual framework was undertaken. The most significant finding evident is that no stations perform well as both a Node and a Place. Whilst several stations perform well solely as Nodes (Murdoch, Warwick, Cockburn Central and Cannington), others function predominantly as Places (Subiaco, Joondalup and Leederville). Wellard and Maddington are suggestive of stations that are "dependent". The remaining stations indicate some balance between their Place and Node function.</p>  <p><i>Place and Node performance of 13 station precincts using team weightings (Background Traffic indicated by size of sphere)</i></p> <p>The findings help to demonstrate that:</p> <ul style="list-style-type: none"> Efforts to create TODs in Perth are best focused on stations outside freeway medians and in the hinterland of freeway median stations assuming that there is satisfactory investment in secondary transit (light rail and bus rapid transit). If stations are located in or near freeways, particularly in outer city locations <ul style="list-style-type: none"> they may be better to serve as enhanced Nodes, with a predominantly interchange function for a larger regional catchment a case may be made for a staged approach to develop as Places, using park-and-ride as an interim land use and later providing large developable land lots for activity centre development. Divergent stations may be better for Place (Joondalup) but no strong indication that Divergent configurations are better functioning in other respects; they have good background traffic (BT) performance, but they do not perform well as Nodes.
Further Research Opportunities	Additional performance measures to better reflect the underlying Place, Node and Background Traffic functions, and the future development potential of the station areas is required. The current measures represent the status quo performance conditions, and there are limitations to the question of how stations Node and Place functionality may be developed.
Output	<ul style="list-style-type: none"> Technical Report Conference paper Book chapter
Outcome	The roll-out of the node and place concept developed and applied to 13 stations is to be further developed and rolled out to all stations as part of a 2016/17 PATREC project (Project 1: Addressing Future Uncertainties of Perth at 3.5 million: What-if Scenarios for Mass Transit).

Project Name	AURIN WA Data Hub
Program Area	Land use-Transport Modelling, Information and Economics
Steering Committee	AURIN (Client), Landgate, DoP
Research Team	V. Paul, P. Hooper, D. Purnovo (DoP), B. Boruff, S. Biermann
Duration	April 2014 – March 2015
Purpose	To enable programmatic access to WA data through the AURIN portal to allow urban researchers, policy and decision makers across Australia to interrogate and analyse WA spatial datasets along with many other datasets within the AURIN environment. The focus was on transport and urban planning datasets.

Project Name	AURIN WA Data Hub
Outputs	Using Web Feature Service (WFS) to facilitate data access to geospatial data through Landgate's Shared Land Information Platform (SLIP), this project delivered 174 datasets through SLIP (Classic) able to be harvested by AURIN with ALL metadata records completed; enabled 39 Department of Planning datasets able to be harvested by AURIN (no metadata available); and obtained and integrated new datasets into the WA Data Hub.
Further Research Opportunities	The Director was invited to participate in a process of planning for a hub-based, AURIN II.
Outcome	The Director was invited to participate as a CI for a collaborative ARC LIEF grant based on AURIN – Urban Analytics Data Infrastructure (successful).

Project Name	Stated Preference Survey – Experimental Design
Program Area	Land use-Transport Modelling, Information and Economics
Steering Committee	A. Kleidon, R. Han
Research Team	D. Olaru, B. Smith, H. Ying
Duration	October 2014 – February 2015
Purpose	To design a suite of Stated Preference (SP) surveys and to examine the advantages and feasibility of combining these SP surveys with the upcoming Perth and Regions Travel Survey (PARTS, scheduled for 2016) to improve the mode choice component of Perth's strategic models of the current strategic models.
Findings	Drawing on state-of-the-art practices in designing SP experiments, a number of recommendations were made, including: <ul style="list-style-type: none"> • SP should form part of the PARTS 2016 household travel survey • SP to be primarily applied to the journey to work or education travel purpose • SP instrument should be designed to support decisions in 1) managing congestion during peak hour and 2) forecasting the patronage for a new light rail service • Pilot studies should be undertaken • SP component of the survey needs to be solidly embedded into the main survey instrument - SP instrument should be as seamless as is possible • SP choice sets and attribute levels should be conditioned on RP data using appropriate segmentation that takes into account the respondent's context • SP should account for departure time • Administration of the surveys should be integrated into one organisation, with consistent channel of communication with respondents.
Output	<ul style="list-style-type: none"> • Conference paper • Technical Report
Outcome	PATREC was asked to review the Request for Proposals as part of the tender documentation and Doina Olaru has been asked to be part of the proposal evaluation process.

Project Name	WA Freight Studies: <ul style="list-style-type: none"> • Urban - PILOT - Retail Supply Chains - Freight Vehicle Usage of Perth Metropolitan Roads • Regional - Grain Freight Activity on Southern Wheatbelt Roads
Program Area	Freight Studies
Steering Committee	Anne-Marie Brits (DOT); Brett Hughes (DOT), Wes Soet (MRWA)
Research Team	Tim Hoffman, Courtney Babb, Monir Moniruzzaman with in-kind support from DOT (Gavin Chan)
Duration	December 2014 – December 2015
Purpose	<ul style="list-style-type: none"> • The Urban Freight project is to provide a qualitative understanding of freight vehicle usage per industry sector supply chain, starting with the grocery sector of the retail industry as a pilot to provide a platform for a more fine-grained analytical study. • The Regional Freight project is conceived as the first attempt to gain some systematic knowledge of grain road freight usage over the course of an export grain season.

<p>Findings</p>	<p>Urban Freight Pilot: Supermarket Sector</p> <p>The map shows estimated daily heavy vehicle numbers (ie semi-trailer combinations) and does not include any estimates of lighter trucks and vans servicing the sector. The map is a summary of estimated heavy vehicle numbers for the three major retailers, their main supply locations, including rail freight yards and meat, milk and bread suppliers, their DCs and their network of stores. It can be seen that heavy vehicle use is concentrated onto a few major highways linking the key industrial zones with the greater urban area. The great majority of these movements utilise the Kwinana, Graham Farmer and Mitchell Freeways, and the Tonkin and Reed Highways. The geographic spread of stores across the city serves to dissipate the number of heavy vehicles on lesser roads quite dramatically.</p>  <p style="text-align: center;"><i>Estimated daily heavy vehicle usage for grocery sector – Greater Perth urban area</i></p> <p>Regional Freight: Grain Freight on Southern Wheatbelt Roads</p> <p>The project has demonstrated the type of road use analysis for the Wheatbelt regions which can be obtained through combining traffic count resources (both permanent and temporary) with broad aggregated grain industry data. It readily demonstrates the capacity to show how routine grain industry road usage affects the overall traffic mix on key road sections, and allows measurement of the significance of this usage, and its peaks and troughs.</p> <p>Data provided for this study by both CBH and Bunge is aggregated so as not to risk any confidential information being made widely available. Bunge does not provide origins for its trucking, but does provide daily numbers arriving at its Bunbury terminal. It has also provided some data on the numbers of trucks carrying grain to Bunbury from its new bins at Arthur River and Kukerin. CBH data does include information on originating bins, but on a monthly rather than daily basis.</p> 
<p>Further Research Opportunities</p>	<p>The retail consumer goods sector would be a logical target to expand the urban freight pilot. This sector, like the grocery sector, is reasonably contained to a small number of major retailers with well-defined locations and relatively simple chains. This study would allow a rounded overall picture of the ‘retail’ sector in Perth to be developed. It should be possible to negotiate the regular provision of this data on a more granular basis by each company if it is considered useful information for transport policy makers and roads authorities.</p> <p>It is suggested that there is no obvious need for any extension to this type of monitoring (especially the use of temporary counters) until such time as a more comprehensive update of the 2010 Strategic Grain Network Report (SGNR) has been undertaken.</p>
<p>Outcome</p>	<p>This urban grocery sector pilot study has shown that an understanding of and planning for road freight transport in Perth can be well-informed, through a qualitative ‘bottom-up’ analysis of the industries it serves. A project to roll-out the methodology for the whole retail sector has been approved for 2016/17.</p> <p>The southern Wheatbelt grain freight road use data provided provides a useful insight into the overall use of the road network by CBH and others in the grain industry, although the monitoring was not comprehensive enough to capture all road freight movements. The data should provide some assistance in future decisions by regional management as to the allocation of maintenance and upgrade funding for various road sections in the network.</p>

Project Name	Review of Infrastructure Planning and Financing Options for WA
Program Area	Infrastructure Funding and Implementation
Research Team	Paul McLeod
Independent Reviewer	Prof Sergio Jara-Diaz, University of Chile
Duration	Stage 1: March 2014 – January 2015 (Research Priorities) Stage 2: January 2015 – December 2015 (Project Planning)
Purpose	To identify research priorities for PATREC through a review process (Stage 1) as the basis for developing specific project proposal/s (Stage 2).
Findings	In Stage 1 it was found that there are several areas of research where PATREC could potentially add value to the policy debate, such as Congestion Charges, Public Private Partnerships (PPP), Refinancing with Privatisation and Regulatory Asset Bases (RABS) and Value Capture. Road pricing as an instrument to achieve efficiency and value capture and its applicability to Perth emerged as high priorities. In Stage 2, after further discussions with stakeholders, it became clear that what is needed is research that integrates value capture into the PPP framework so that predicted value capture receipts can be factored into the PPP framework for funding of construction and operation.
Output	<ul style="list-style-type: none"> • Technical Report - Research Priorities Discussion Paper (Stage 1) • Project Proposal on the integration of value capture into the PPP framework (Stage 2) put forward for consideration for funding in the 2016/2017 round of PATREC priority projects. • Book chapter (PATREC Book)

Project Name	Activity Centres Accessibility (RAC)
Program Area	Land use-Transport Modelling , Information and Economics
External Client	RAC (Sarah Cutter and Anne Still)
Research Team	M. Moniruzzaman, D. Olaru and S. Biermann
Independent Reviewer	Ian Espada (ARRB)
Duration	October 2014 – May 2015
Purpose	The goal of the study was to ascertain, through analysis of accessibility and development potential, which activity centres should be prioritised to support decentralisation of jobs, encourage better integration of transport and land use and ultimately aid the evaluation of a more compact, consolidated and connected city.
Findings and Outcome	Commercial-in-confidence

Seed Project Name	Research Team	Purpose	Output/Outcomes
Mobile Fitness Application Data to Model Bicycle Usage Patterns	D Blake	Effectiveness of using individual cycling information collected using mobile phone applications, to model bicycle usage in the Perth.	Technical Report http://www.ecu.edu.au/news/latest-news/2015/02/app-data-to-assist-bike-infrastructure https://au.news.yahoo.com/thewest/a/26434768/back-roads-chosen-over-cycle-paths/
Suburbs Research for Australian Cities	P Maginn, D Gordon, A Sisson, I Huston, S Biermann	Visiting Prof Gordon led a research project which defines, classifies and maps Australia's "suburban" following the methodology he established and applied in Canadian cities, strongly based on transport criteria. Using 2011 ABS census data, including journey to work data, Australian cities with a population of greater than 50,000 were analysed. Perth was used to trial the methodology for application to Australian cities.	<ul style="list-style-type: none"> • PATREC Perspective • Seminar with PIA • Peer review of Activity Centres - stations project • PIA publication Suburb to City, Essays on Transformation, Urban Design Forum 2014-2015 • Journal paper forthcoming

Seed Project Name	Research Team	Purpose	Output/Outcomes
Transport Technology Futures	L Gladstone, C Sun	Literature scan of impact of technology changes on transport demand. Research opportunities in area of legal and policy system for AV testing.	<ul style="list-style-type: none"> Literature synthesis report Project proposal – legal and policy system for AV testing Book chapter (PATREC Book)
Travel Behaviour Change	C Ferguson	To provide research from a behavioural perspective that will increase knowledge of what is required to facilitate behavioural change in individuals in choosing transport options to alleviate congestion.	<ul style="list-style-type: none"> Technical Report Book Chapter (PATREC Book)
Employment Self-sufficiency (\$5K)	K Martinus, S Biermann	Employment pattern and decentralisation research opportunities.	<ul style="list-style-type: none"> Journal paper (under review) Seminar presentation (Thomas Sigler) Book chapter (PATREC book) Concept grant proposal with UQ

3 KNOWLEDGE TRANSFER

Part of PATREC’s value proposition is ensuring knowledge transfer through (non-)academic publications, connection events and an information portal (website) as a reliable and accessible resource for researchers and policy-makers. The highlight in 2015 was the PATREC Research Forum which showcased the results of PATREC projects and other planning and transport related research. PATREC continued to host and co-host a series of seminars.

3.1 PATREC Research Forum 2015

With many research projects having been completed in 2015, it was an ideal time to host a PATREC Research Forum. Held on 16 November 2015 in Fremantle, the Forum was attended by 113 people (academics, government and consultants). The Forum was organised into two parallel streams of three sessions, chaired by our government partners (Program at Appendix A). 28 talks were presented (Table 2), many of which have been converted into book chapters to be published in the forthcoming PATREC book “Planning Boomtown and Beyond”, due for release in late 2016.

Table 2: Presentations at the PATREC Research Forum on 16 November 2015

Presenters	Title
M. Fulker	Introduction
A. Joutsiniemi	Boomtown, metapolis and competing neologisms of urban form
P. Newman	Infrastructure Planning in Perth: Past, Present and Future
K Martinus, T. Sigler	Boomtown goes global: Perth as an internationally connected resource hub
Y. Sun, L. Gladstone, J. Taplin	Hype or hope – can future transport technologies ease congestion
R. Jones	Local Government amalgamation and the lack of a metropolitan government: a political geography
P. McLeod	Funding transport infrastructure to support Perth’s growth – options and strategies
N. Foley	Planning system trends
B. Smith, C. Babb, B. Hughes	Travel Demand Management options
S. Cox , T. Jones	Unsettling planning in Perth: indigenous planning in a boom
C. Ferguson:	Managing and motivating sustainable travel behaviour change
S. Biermann, K. Martinus	Plans, targets and models: mechanism to enhance integration between land use and transport planning
C Curtis, J. Scheurer	Did Perth's growing wealth lead to growing transit accessibility?
C. Babb, R. Falconer, D.Olaru, A. Duckworth-Smith, R. Isted	Transport and land use functions of four rail station configurations in Perth
G. McCarney	Accessibility – a Parramatta for Perth?
A. Duckworth-Smith	Testing strategic planning for Activity Corridors through urban design research
J. Taplin, Y. Huang B. Smith:	Public transport patronage success – the role of Park’n’Ride
C. Babb on behalf of R. Falconer	Cities as systems: node functions of stations and network creation
J. Xia, S. Nurlaela, D. Tuladhar, T. Lin, T.Litman	Exploring distance decay pattern of transport induced agglomeration around Perth stations
R. Isted	Urban modelling for Perth 2050: the dangers and opportunities
T. Perkins, D. Blake	Cycling in Perth: a case-study of mobile phone fitness applications
M. Atkins	Baby Boomers in Boomtown
D. McFarlane	Will Perth have enough water for its diverse needs in a drying climate?
T. Hoffman, C Babb	Road freight activity in Perth's grocery supply chains
B. Boruff, N. Pauli	Perth’s natural environment and urban liveability
F. Affleck	Freight and land use planning: noise impacts
B. Boruff on behalf of F. Bull, P. Hooper	Liveable Boomtown
F. Haslam McKenzie	Boom Doom and Gloom
V. Paül	Peri-urban open spaces: a missing dish on the Boomtown planning menu?

3.2 Events

PATREC hosted or co-hosted seven seminars in 2015, attracting over 200 delegates. In addition, PATREC sponsored a CEDA event on the Future of Roads and was associated with the UWA Institute of Advanced Studies Public Lecture by Prof David Gordon, whose work PATREC supported with seed funding. Both these events drew audiences of around 150 each.

Table 3: Overview of PATREC hosted (and co-hosted) Events

Speaker	Presentation Title	Event	Date	Attendees
Yuchao Sun , Research Fellow, PATREC	COULD: COmputational Urban Layout Design	Australian Early Career Urban Research Network (AECURN)/PATREC seminar	6 Mar 15	12
Stephen Fargo , Practicing Architect and PhD Candidate, AUDRC	Commuting Volume/Direction, Workplace Distribution, and Activity Centre Planning in Perth Metropolitan Sub-regions			
Prof David Gordon , Director of the Queen's University School of Urban and Regional Planning, Canada	Sustainable Suburbs? – Best practices from Canada	UWA Institute of Advanced Studies	29 Apr 15	150
Assoc Prof Lael Parrott , Okanagan Institute for Biodiversity, Resilience, and Ecosystem Services (BRAES), The University of British Columbia, Canada	Towards resilient and sustainable landscapes	UWA Business School/PATREC seminar	13 May 15	30
Assoc Prof Christo Venter , Department of Civil Engineering, University of Pretoria, South Africa	GPS-derived metrics for assessing the equity impacts of tax and toll road funding: Recent experience in Gauteng, South Africa	PATREC Seminar	8 Jun 15	20
Assoc Prof Doina Olaru and Dr Brett Smith , UWA Business School/PATREC	The Future of Perth: a Panel Discussion with UWA and PATREC Researchers and Industry Experts (Research Week 2015)	UWA Business School/PATREC panel discussion	7 Sep 15	55
Prof Corinne Mulley , founding Chair in Public Transport, Institute of Transport and Logistics Studies, University of Sydney	Identifying resident preferences for public transport investments: a buy-in perspective	PATREC seminar	18 Sep 15	20
Keynote by Peter Harris , Chairman Productivity Commission Mr Terry Agnew , Group Chief Executive Officer RAC of WA Dr Keith Hampson , Chief Executive Officer Sustainable Built Environment National Research Centre Mr Tony Earl , Acting Director, Road Network Operations, Main Roads Western Australia	Future of Roads	CEDA event, sponsored by PATREC	17 Nov 15	140

Speaker	Presentation Title	Event	Date	Attendees
Assoc Prof Anssi Joutsiniemi , Tampere University of Technology, Finland	The cost of information-seeking and changes in datascape in urban planning	PATREC/URBANET Seminar: How can big and open data advance urban policy and planning practice?	18 Nov 15	37
Yuchao Sun , Research Fellow, PATREC	Using crowd-sourced GPS data for road performance monitoring			
Dr Thomas Sigler , Lecturer in Human Geography, The University of Queensland	Using location-based corporate data to understand the global role of Australian cities			
Prof Chris Pettit , Associate Director, City Futures Research Centre, The University of NSW,	On the Completeness of Open City Data for Measuring City Indicators			
Prof Fiona Haslam-McKenzie , Co-director of the Centre for Regional Development, The University of Western Australia	Regional Development and Planning in Western Australia with a European Reference	Centre for Regional Development/ PATREC Seminar	19 Nov 15	18
Dr Valerià Paül , Department of Geography, University of Santiago de Compostela, Galicia Spain				

3.3 Industry Engagement

The Director was invited to address transport and planning research related issues on several occasions in 2015 and accepted invitations to speak at the following events:

- **UWA Research Week** “Future of Perth” Panel Discussion on 7 September 2015. The title of the Director’s presentation was “Planning and Transport Research Challenges and Findings”.
- **ARUP Crowdsourcing a City Series**, 31 March 2015, the Director gave a presentation titled “Topic: Fast Forward Fifty – Perth Journeys Imagined – 50 Years From Now”.
- **Interview:** A requested interview (7 May) by Channel 7 eliciting a response of PATREC to Colliers International white paper on parking, ‘The evolution of car parking – technology creating risk and opportunity’. The interviewer was mainly interested in the price and availability of parking in Perth CBD. Brett Smith argued that there was no major shortage of parking places in Perth CBD and that the parking rates are in line with being the 4th largest city in Australia. PATREC’s understanding is that this news item did not go to air.

A number of media opportunities were pursued including:

- A UWA press release was issued on 26 February 2015, announcing Yuchao Sun’s publication: “Bio-inspired computer model that can design street layouts”.
- Cycling project (ECU) - In the article on ECU website PATREC was acknowledged: <http://www.ecu.edu.au/news/latest-news/2015/02/app-data-to-assist-bike-infrastructure>
<https://au.news.yahoo.com/thewest/a/26434768/back-roads-chosen-over-cycle-paths/>
- The Director accepted a requested interview by Channel Nine News, prompted by the Research Week at UWA. The interview did not take place.
- Brett Smith was interviewed (1 September 15) on a local radio station in NSW on Park and Ride.

3.4 Building Capacity in WA

- PATREC hosted a hands-on AURIN What-if Training Course on 20 November 2015.
- The Director and PATREC Research Fellow, Chao Sun, contributed to ECU's transport planning teaching unit on 22 October 2015.
- PhD Top-up Scholarship awarded to Mr Hendrik Braun (Business School, UWA, supervisor Assoc Prof Doina Olaru) on 20 May 2015 for the duration of three years. His PhD is entitled "Revenue management in road freight transport: Capacity control and dynamic request integration under profit maximisation".

3.5 Research Outputs

On finalisation and with the permission of the client, final research project Technical Reports are published on the PATREC website. In 2014 the "PATREC Perspectives" series was introduced, as a way of communicating research findings in an accessible format, presenting substantiated research ideas which may evolve into a full research project, or the Perspective may be of a monitoring-type which could periodically update key planning and transport trends. Three Perspectives were published on the PATREC website in 2015. Academic outputs in the form of journal papers, conference papers and book chapters were produced (Table 4).

Table 4: Research Outputs

Publication Title	Author/s	Publication Date
RESEARCH PROJECT TECHNICAL REPORTS COMPLETED		
Stated Preference Surveys - Experimental Design (DoT)	Smith, B., Olaru, D., Ying, H. & Biermann, S.	3 Feb 15
Activity Centres: Making Land Use And Transport Work - Phase 1: Stations in or near freeway medians - reconciling node/place conflicts	Babb, C., Duckworth-Smith, A., Falconer, R., Isted, R., Moniruzzaman, M., Olaru, D. & Biermann, S.	1 Sep 15
Activity Centres Accessibility (RAC)	Moniruzzaman, M., Olaru, D. & Biermann, S.	11 Nov 15
Urban - Freight Vehicle Usage of Perth Metropolitan Area Roads	Hoffman, T.	4 Jun 15
Regional - Grain Freight Activity on Southern Wheatbelt Roads	Hoffman, T.	24 Nov 15
Mass Rapid Transit for Perth & Peel @ 3.5 Million and Beyond	Affleck, F.	11 Feb 16
Mass Rapid Transit - Working Paper 1: Future Trends and Mass Transit 2050	Gladstone, L.	Dec 2015
Mass Rapid Transit - Working Paper 2: Employment & Population Scenario Modelling	MacFarlane, J. and Kyne, R.	Oct 2015
Mass Rapid Transit - Working Paper 3: Sketch Modelling for Mass Transit Options	Piggott, L. & Patterson, D.	Dec 2015
Mass Rapid Transit - Working Paper 4: Sensitivity Analysis for Mass Transit Options	Olaru, D., Piggott, L., Smith, B., McCarney, G., & Patterson, D.	Dec 2015
Mass Rapid Transit - Working Paper 5: International Learning on Network Planning and Its Contribution to Perth and Peel @ 3.5 million	Mulley, C.	Dec 2015
Mass Rapid Transit - Working Paper 6: Option Generation and Assessment	Smith, B.	Jan 2016
Mass Rapid Transit - Working Paper 7: Perth City Rail 'Metro' Assessment	Hoare, J.	Jan 2016

Publication Title	Author/s	Publication Date
JOURNAL PAPERS PUBLISHED		
Derivation of demand elasticities from travel choice elasticities. <i>Journal of Transport Economics and Policy</i> , 49(1)	Smith, B. & Taplin, J.	Jan 2015
Participatory Sustainability Approach to Value Capture-Based Urban Rail Financing in India through Deliberated Stakeholder Engagement. <i>Sustainability</i> , 7, 8091-8115.	Jillella, S.S.K., Matan, A., & Newman, P.	Jun 2015
About time the regions were recognised: A discussion on the region-building process in Western Australia. <i>Australian Geographer</i> , 46(3). DOI: 10.1080/00049182.2015.1049242	Paül, V. & Haslam-McKenzie, F.	Sep 2015
Influence of Parking on Train Station Choice under Uncertainty for Park-and-Ride Users. <i>Procedia Manufacturing</i> , 3, 5126-5133	Chen, C., Xia, J. C., Smith, B., Olaru, D., Taplin, J. & Han, R.	Oct 2015
Measuring the Accessibility of Public Transport: a critical comparison between methods in Helsinki. <i>Applied Spatial Analysis and Policy Measuring</i> , DOI 10.1007/s12061-015-9177-8	Albacete, X., Olaru, D., Paül, V. & Biermann, S.	Nov 2015
BOOK CHAPTERS		
Pragmatic incremental or courageous leapfrog [re]development of a land use-transport modelling system for Perth, Australia (2015), in <i>Planning Support Systems and Smart Cities</i> , Geertman, S., Ferreira, Jr., J., Goodspeed, R., Stillwell, J. (Eds.), Springer.	Biermann, S., Olaru, D., Taplin, J. & Taylor, M.	
Physical verification of household rainwater tank systems (2015), in <i>Rainwater Tank Systems for Urban Water Supply</i> , Ashok K. Sharma, Donald Begbie and Ted Gardner (Eds), IWA Publishing.	Biermann, S. & Butler, R.	
PATREC PERSPECTIVES		
Tolls, Taxes or Travelsmart? - Travel demand management solutions for congestion	Courtney Babb, Brett Smith and Sharon Biermann	May 2015
Sensing Technology Innovations for Tracking Congestion	Isabel Huston, Sharon Biermann, Doina Olaru and Yuchao Sun	Aug 2015
Estimating the size of Australia's Suburban Population	David Gordon, Paul Maginn, Sharon Biermann, Alistair Sisson, Isabel Huston and Monir Moniruzzaman	Oct 2015
CONFERENCE PAPERS PRESENTED AND PUBLISHED IN PROCEEDINGS		
Modelling travellers' choice between park-and-ride and other modes of travel to work in the context of uncertainty. Paper presented at the International Choice Modelling Conference, Austin, USA (9-13 May 2015)	Huang, Y., Smith, B., Olaru, D. & Taplin, J.	May 2015
Stemming car dependency and improving transport options in Indian cities. Innovative Transit Financing For Indian Cities Workshops, Delhi, India (28 May-3 Jun 2015)	Jillella, S.S.K.	Jun 2015
Improve understanding and skills around transit-oriented design and value capture through the deliberative democracy process: Bangalore city. Innovative Transit Financing For Indian Cities Workshops, Delhi, India (28 May-3 Jun 2015)	Jillella, S.S.K.	Jun 2015
On the buses or on the clock? An error components diagnostic of commuters' time of departure and mode choices in the context of uncertainty. Paper presented at the International Association of Travel Behaviour Research (IATBR) meeting, Windsor, UK (19-23 July 2015)	Huang, Y., Smith, B., Olaru, D. & Taplin, J.	Jul 2015
The performance and potential of rail stations in and outside freeway medians: the application of a node/place model to Perth. Paper presented at and published in the proceedings of the Australasian Transport Research Forum (ATRF) in Sydney (30 Sep-2 Oct 2015)	Babb, C., Duckworth-Smith, A., Falconer, R., Isted, R., Olaru, D. & Biermann, S.	Oct 2015

Publication Title	Author/s	Publication Date
Combining stated and revealed preference surveys in strategic transport models. Paper presented at and published in the proceedings of the Australasian Transport Research Forum (ATRF) in Sydney (30 Sep-2 Oct 2015)	Smith, B. & Oлару, D.	Oct 2015
Electric Vehicles Adoption: Environmental Enthusiast Bias in Discrete Choice Models. Paper presented at and published in the proceedings of the Australasian Transport Research Forum (ATRF) in Sydney (30 Sep-2 Oct 2015) *Awarded the Lindsay Oxlad Best Paper on Transport Modelling and Analysis	Smith, B., Greaves, S., Jabeen, F. & Oлару, D.	Oct 2015
Is there a Best-Worst (B-W) sequence: Evidence from a PnR study on commuters in Perth? Poster presented at the Australasian Transport Research Forum (ATRF) in Sydney (30 Sep-2 Oct 2015)	Huang, Y., Oлару, D. & Smith, B.	Oct 2015
Travel Demand Management Matrix and an Evaluation Framework. Poster presented at the Australasian Transport Research Forum (ATRF) in Sydney (30 Sep-2 Oct 2015)	Babb, C. & Smith, B.	Oct 2015
Modelling Behavioural Responsiveness in City Structuring. Paper presented at and published in the proceedings of the State of Australian Cities Conference (SOAC) on the Gold Coast (8-10 December 2015)	Biermann, S., Pettit, C. & Brits, A.	Dec 2015
Indicating Quality of Place for station precinct development: enhancing 'place' in the place/node model. State of Australian Cities National Conference. Gold Coast. (9-11 Dec 15)	Duckworth-Smith, A. & Babb, C.	Dec 2015

Table 5: Journal Papers and Book Chapters Submitted in 2015 for Publication

Title of Paper	Authors
Spatial Planning Down Under. <i>Evolution, Governance and Policy Reality of Strategic Spatial Plans in Australia</i> (Book chapter)	Maginn, P., Paül, V. & Biermann, S.
Electric Vehicles Adoption: Environmental Enthusiast Bias in Discrete Choice Models, <i>Transportation Research D: Transport and Environment</i>	Smith, B., Oлару, D., Jabeen, F. & Greaves, S.
An availability design for air ticket choice to capture upsell and recapture rates when multiple decision rules are applied, <i>Journal of Choice Modelling</i>	Wang, J., and Smith, B
The dog wagging its tail: Policy led choice of the most appropriate empirical model to estimate hedonic prices in the residential market, <i>Journal of Economic Geography</i>	Oлару, D., Smith, B., Mulley, C. & Ma, L.
Combining samples to offset nonresponse and respondent biases, <i>Case Studies in Transport Policy</i>	Jabeen, F., Oлару, D., & Oлару, D. Smith, B.,
Applying principles of agent-based modelling and developmental biology for automated urban residential layout design, <i>Environment and Planning B</i> (resubmission)	Sun, Y. & Taplin, J.
Innovative Value Capture based Rail Transit Financing: An opportunity for Emerging Transit Cities of India	Jillella, S.S.K. & Newman, P.
Emerging Value Capture Innovative Urban Rail Funding and Financing: A Framework. <i>Handbook of Research on Emerging Innovations in Rail Transportation Engineering</i> (Book Chapter)	Jillella, S.S.K., Sitharam, T. G Matan, A. & Newman, P.

4 PEOPLE AND RESOURCES

4.1 Staffing

During 2015, the capacity of the core research team was considerably supplemented through involvement of consultants with the necessary complementary expertise to meet the skills requirements for in particular the Mass Rapid Transit @3.5 research project (Table 6).

Table 6: Research Staff and Associates

PATREC Office		
Sharon Biermann	0.6 FTE	Director
Andrew Lo	0.7 FTE	Centre Administrator
Valeria Paül	0.4 FTE	Research Development Office (until Feb 2015)
Chao Sun	0.4 FTE	Research Fellow (from Feb 2015)
Core Research Team		
Sharon Biermann (PATREC)	0.4 FTE	Program Leader: Integrated LU-T policy and planning
Yuchao Sun (PATREC)	0.6 FTE	Research Fellow
Doina Olaru (UWA)	0.25 FTE	Program Leader: Modelling, information and economics
Brett Smith (UWA)	0.5 FTE	Research Associate – Modelling, information and economics
Courtney Babb (Curtin)	0.5 FTE	Research Associate – Integrated LU-T policy and planning (until July 2015)
Gary McCarney (DoP)	0.4 FTE	Secondment from Department of Planning (commenced April 2015) at no cost to PATREC
Valeria Paül (UWA)	0.6 FTE	Program Leader: Regional Planning and Transport (until Feb 2015)
Monir Moniruzzaman (UWA)	1.0 FTE	Research Associate – Modelling, information and economics (funded through in-kind contribution of Doina Olaru and Brett Smith – until March 2015)
Extended Core Research Team		
Paul McLeod (UWA Adjunct, consultant)	Sub-contracted	Program Leader: Infrastructure Funding
Tim Hoffman (Consultant)	Sub-contracted	Program Leader: Freight Studies
Project-based Research Associates – WA		
Anthony Duckworth-Smith (AUDRC, UWA)	Sub-contracted	Activity Centres: Making Land use and Transport work – stations in freeway medians
Ryan Falconer (ARUP)	Sub-contracted	Activity Centres: Making Land use and Transport work – stations in freeway medians
Richard Isted (Jacobs)	Sub-contracted	Activity Centres: Making Land use and Transport work – stations in freeway medians
Paula Hooper (CBEH, UWA)	Sub-contracted	AURIN – WA Data Hub
Bryan Boruff (CBEH/SEE, UWA)	Sub-contracted	AURIN – WA Data Hub
John Taplin (UWA)	Sub-contracted	Independent Transport Modelling Review
David Blake and Tim Perkins (ECU)	Seed-funded	Mobile Fitness Apps and Cycling Patterns
Cath Ferguson (ECU)	Seed-funded	Travel Behaviour Change
Laura Gladstone (Consultant)	Seed-funded	Future Technology Impacts on Transport
Kirsten Martinus (UWA)	Seed-funded	Employment Patterns and Decentralisation
Laurie Piggott (Consultant)	Sub-contracted	Mass Rapid Transit@3.5
Jason McFarlane, Rob Kyne (Consultants)	Sub-contracted	Mass Rapid Transit@3.5

External Reviewers/Project Team – National/International		
Ian Espada (ARRB)	Sub-contracted	External Reviewer: RAC Accessibility of Activity Centres
Graham Currie (Monash University)	Sub-contracted	External Reviewer: Congestion Abatement through Travel Demand Management; Mass Rapid Transit @3.5
Corinne Mulley (ITLS)	Sub-contracted	Mass Rapid Transit @3.5 external advisor
Chris Pettit (UNSW)	Sub-contracted	Mass Rapid Transit @3.5 external advisor
David Gordon (Queens University, Canada)	Sub-contracted	External Reviewer - Activity Centres: Making Land use and Transport work – stations in freeway medians and Suburbs seed-funded project

4.2 Finances

Table 7 provides the status of YTD actual income and expenditure against budget as at the end of the financial year (31 December 2015). Total income of \$910,604 exceeded budget due to higher than expected external research grant income as a result of the Mass Rapid Transit @3.5 research project (\$385,600).

Total expenditure was \$1,184,370, which is \$175K under budget due mainly to lower than expected core research program and academic salary expenditure (Valeria Paul and Courtney Babb leaving). A balance of just over \$1M was carried forward to 2016, \$388K over budget as a result of \$213K more income than budgeted and \$175K under-expenditure.

Table 7: Financial Summary for 2015

Item	YTD Actual 31/12/2015	Budget 2015	Variance Budget vs Actual
INCOME			
Collaborating Partners - Core funding	420,000	420,000	
Other Research Grants & Contracts/Tenders	445,990	240,000	205,990
Accrued Interest	44,614	38,000	6,614
Total Income	\$910,604	\$698,000	\$212,604
EXPENDITURE			
PATREC OFFICE (excl. research of Dir. & RDO)	550,415	713,965	163,550
RESEARCH (incl. research of Dir. & RDO)	633,955	645,400	11,445
Total Expenditure	1,184,370	1,359,365	174,995
BALANCE (Income less expenditure)	-273,766	-661,365	387,599
Balance Carried Forward from 2014	1,300,351	1,300,351	
CLOSING CASH BALANCE	\$1,026,585	\$638,986	\$387,599

5 GOVERNANCE

5.1 Advisory Board Members

The PATREC Advisory Board comprises a senior representative of each of the collaborating Parties and a Chair who is independent of all Parties. The PATREC Director is an ex officio member of the Advisory Board. There have been three changes of representatives to the Advisory Board:

- ❖ **Graeme Doyle** replaced Sue McCarrey as the Department of Transport representative;
- ❖ **Keith Hampson** replaced Mike Burbridge as the Curtin University representative; and
- ❖ **Tim Perkins** replaced Geoff Syme, as the Edith Cowan University representative.

Table 8: PATREC Advisory Board Members

2014	2015
Adjunct Prof Fred Affleck, Independent Chair	Adjunct Prof Fred Affleck, Independent Chair
Mr Eric Lumsden, Chair, Western Australian Planning Commission	Mr Eric Lumsden, Chair, Western Australian Planning Commission
Mr Stephen Troughton, Managing Director, Main Roads Western Australia	Mr Stephen Troughton, Managing Director, Main Roads Western Australia
Ms Sue McCarrey, Deputy Director General, Department of Transport	Mr Graeme Doyle, Managing Director, Policy Planning and Investment, Department of Transport
Mr Mike Burbridge, Executive Director of Australian Sustainable Development Institute, Curtin University	Prof Keith Hampson, Chief Executive Officer, SBEnc, Curtin University
Prof Geoff Syme, Professor of Planning, Edith Cowan University	Mr Tim Perkins, Program Director Centre of Planning, ECU, Edith Cowan University
Prof Matthew Tonts, Head of School of Earth and Environment, The University of Western Australia	Prof Matthew Tonts, Head of School of Earth and Environment, The University of Western Australia
Prof Sharon Biermann, Director PATREC	Prof Sharon Biermann, Director PATREC

5.2 Review of PATREC Sustainability

At the Advisory Board Meeting held on 12 March 2015 (No. 39), it was agreed that the sustainability of PATREC was being hampered by the fixed termination date in the present five-year Collaboration Agreement which runs to mid-2017. As the date for termination has moved to a horizon of less than two years, it has become virtually impossible to recruit and/or retain qualified and experienced academic staff. It was agreed that a review of arrangements for the continuing and sustainable operation of PATREC should be undertaken, with a view to renewal of the Collaborative Agreement, in a different form if appropriate.

Consultants were engaged to advise the Advisory Board on:

- the effectiveness of the current inter-university 'collaborative' research model;
- the effectiveness of fixed-term renewable collaborative agreements;
- appropriate models for research collaboration for the future of PATREC after termination of the present agreement;
- appropriate models for financial and academic resourcing for the future of PATREC; and
- after consultation with the Chair of the Advisory Board, any other relevant matters.

Australian Venture Consultants (AVC) submitted their final report on 12 October 2015 with the following principal findings:

- There remains a strong need for planning and transport research in WA. AVC: *“It is abundantly clear from consultation processes that there are short and long term research needs to be met in respect of transport and planning matters in Western Australia...”*.
- There is a role for PATREC in meeting the need. AVC: *“...PATREC can have a strong role to play in meeting those needs.”*
- PATREC has set itself ambitious targets for its limited resources and relatively limited time of ‘renewed’ operation (essentially restarting from a zero base in October 2012). AVC: *“PATREC has set itself ambitious aims on the basis of limited resources.”* And *“PATREC has, essentially, re-established itself as a new centre...”*.
- PATREC has demonstrated strengths and achieved successes. AVC: *“A number of evident strengths and successes for PATREC were raised regularly in the course of consultation.”*
- PATREC is facing some challenges, mostly relating to insufficient levels of staffing:
 - Attracting and retaining appropriately skilled academic staff from within partner universities and externally.
 - Developing a research capacity pipeline through teaching.
 - Reliance on existing public sector agency partners for major project funding.
 - Need for ‘thought leadership’ independent of the governance-oriented Advisory Board.
 - Perceived high administration levels.
 - Achieving outcomes which address both academic and policy-relevant objectives.
 - Building public profile through media and engagement with industry partners.
 - Role and responsibilities of the Advisory Board.
 - KPIs are too ambitious for the small scale of operation and not sufficiently outcome quality-oriented.

It was recommended by the Review that many of these operational constraints could be alleviated through an alternative operational and structural model:

“...the PATREC Board and partners [should] consider a transition from the current collaborative venture to a single University centre [the first step being that] the Board and the PATREC partners consider, as a matter of priority, the establishment of a single University centre to replace PATREC as of April 2017 (or sooner, if preferred and possible)”.

After engagement with PATREC partners following the Review, the following key actions were agreed to address key challenges:

- A new Collaborative Agreement with current collaborating partners and a three-year rolling funding arrangement with an exit clause enabling participants to leave the collaboration after a notice period of one year;
- Establishment of a PATREC Research Advisory Committee (PRAC);
- New set of KPIs – fewer/focussed, outcome-oriented, both academic and policy relevant; and
- Renewed impetus to attract skilled academic staff.

Addressing these and associated actions will be the priority for PATREC in 2016.

6 PERFORMANCE AGAINST KPIS AND TARGETS

No Business Plan as such was finalised for 2015 as a result of the PATREC Review which was undertaken by consultants from May to September 2015 and the resulting process of engagement with partners to considering the recommendations and necessary actions emerging. KPI targets were thus not set for 2015. Only achieved KPIS for 2015 are thus reported against 2014 targets and achievements as a benchmark. KPIS for 2016 have been revised in the Business Plan 2016 in the light of PATREC Review recommendations that they needed to be reduced and focussed on outputs and outcomes.

Broad key performance indicators set for PATREC relate directly to the value-add role or purpose that PATREC was established for. The university collaborators require an increase in research profile and performance while the government partners require better evidence on which to base policy and investment and development spending decisions.

Table 9: Summary Statistics of Performance in Relation to Set Targets

Key Performance Indicators	Targets 2014	Achieved 2014	Achieved 2015	Qualification
Performance impacts for enhanced research capacity				
Number of research grant proposal <i>submitted</i> (external and core funded)	5	6	7	<ul style="list-style-type: none"> • Mass Rapid Transit @3.5 • ARC LIEF – Urban Analytics Data Infrastructure • ARC Centre of Excellence EOI - Critical Transport Infrastructure • AHURI - Housing aspirations and trade-off • Business School Research Development Awards (BSRDA) - Do Autonomous Vehicles spell the end of private vehicle ownership? • ARC Linkage Projects 2016 - Electric City - Electric Vehicle Fast-Charging Infrastructure Requirements
Number of research grants <i>secured</i>	4	7	3	<ul style="list-style-type: none"> • Mass Rapid Transit @3.5 • ARC LIEF – Urban Analytics Data Infrastructure • Business School Research Development Awards (BSRDA) - Do Autonomous Vehicles spell the end of private vehicle ownership?
Number of seed research projects supported		1	5	Mobile Fitness Application Data to Model Bicycle Usage; Suburbs, Transport Technology Futures; Travel Behaviour Change; Employment Patterns and Decentralisation
Number of journal articles, conference papers in proceedings and book chapters <i>published</i> in 2015	5	4	18	See Table 4 (Journal papers – 5; Book chapters – 2; Conference papers – 11)
Number of journal articles, conference papers for inclusion in proceedings and book chapters <i>submitted</i> for publication but not published in 2015	8	4	8	Table 5
Number of top-up scholarship PhD's graduated	1	1	0	
Number of PhD top-up scholarships awarded	3	3	1	Hendrik Braun (UWA)

Profile impacts for improved competitive advantage				
Number of research staff attracted and retained	10	16	24	See Table 6 (8 core team research staff; 2 core team consultants; 14 project sub-contractors)
Value of additional research funding secured	\$500K	\$240K	\$446K	Mainly Department of Transport (Mass Rapid Transit @3.5)
Productive partnerships for institutional vitality				
Attendance number at workshops and connection events	200	350 plus	400 plus	Forum and seminars
Number of external collaboration agreements initiated	4	4	4	Espada, Currie, Mulley, Pettit
Number of joint projects approved		3	1	Mass Rapid Transit @3.5
Policy-relevant evidence for knowledge transfer				
Number of project plans with policy links proposed		6	1	Mass Rapid Transit@3.5 proposal
Number of Steering Committees established and functional		7	1	Mass Rapid Transit@3.5
Number of Technical Reports published	4	3	11	See Table 4
Number of factsheets published	5	2	3	See Table 4
Number of conference papers presented	8	5	28	Excluding Table 4; include Forum
Number of connection events	6	11	10	Table 3
Number of short courses planned/given in projects	0	1	0	



Planning Boomtown and Beyond

16th November 2015
Esplanade Hotel Fremantle, Western Australia



PATREC RESEARCH FORUM 2015 PROGRAM

Partners



About PATREC

PATREC is a unique collaboration between three Western Australian public universities (The University of Western Australia, Curtin University and Edith Cowan University) and the Western Australian government (Department of Transport, Main Roads Western Australia and Western Australian Planning Commission) established for the purposes of conducting collaborative research and teaching in the area of integrated land use and transport policy and planning.

PATREC delivers policy-informing, multi-disciplinary and multi-institutional applied research that extends the evidence-base in support of the effective planning and management of Western Australia's transport and land use futures, drawing from an extended network of academic and industry expertise and policy partners.

PATREC's strong governance structure involving universities, founding industry partners and an independent chairman, ensures a level of independence and a high level of attention to quality outcomes.

The Centre connects people with strong local, national and international experience in research, industry and government, so its programs are highly relevant to contemporary public policy and planning issues.

Through its network of researchers and policy partners, PATREC has successfully delivered a series of policy-informing research projects including reviews of Transport Modelling and Travel Demand Management Instruments, Experimental Design of a Stated Preference Survey for enhancing the collection of travel behavioural data, Accessibility of Activity Centres, Node and Place Conflicts in Activity Centres at Stations in Freeway Medians, Infrastructure Funding Options and Understanding Grain and Retail Freight Movement Patterns. PATREC has been instrumental in the establishment of the WA Spatial Data Hub with the Australian Urban Research Infrastructure Network (AURIN).

Research findings are disseminated through formal academic publications, a series of accessible web-published "PATREC Perspectives", topic specific seminars, PATREC Research Forums, specialist workshops hosting international experts.

As part of its knowledge transfer activities, PATREC is publishing a book "Planning Boomtown and Beyond". The aim of this publication is to showcase the results of recent research undertaken by PATREC and its associates and other researchers in WA to inform policy makers in their task of planning and managing a rapidly growing city like Perth with a diverse range of challenges.

For more information on PATREC and to access our publications, please see our website: www.patrec.uwa.edu.au.

Opening Address



Marion Fulker

Marion Fulker is the founding Chief Executive of the Committee for Perth Ltd. She took up the position in January 2007 having previously been the Executive Director of the Urban Development Institute of Australia (UDIA) WA Division.

The Committee for Perth is the leading think tank on the liveability of the Perth metropolitan area. Foundation members include global brands such as Rio Tinto, BHP Billiton, Woodside and Wesfarmers.

Marion is an Adjunct Senior Research Fellow at the University of Western Australia and holds an MBA from Curtin Graduate School of Business.

Through her on the ground research Marion has become recognised as one of the leading experts on the future growth and development of the Perth region.

In the past decade, Marion has travelled extensively throughout the US, Europe, Australasia and the UK to examine how cities work. Her research focus has been on a range of topics including inner city vibrancy, urban renewal and public transport. Marion's opinions on Perth's future are regularly sought by government and the media.

Additional to her role as the Committee's CEO, Marion is the Chair of the Heritage Council of Western Australia and a director of RugbyWA.

She was a finalist in the Telstra Business Women's Awards and this year was named as one of Australia's 100 Women of Influence.

Keynote Speaker



Dr Anssi Joutsiniemi

Dr. Anssi Joutsiniemi is appointed as Associate Professor and Director of EDGE Laboratory for Architectural and Urban Research of Tampere University of Technology. His research interests are centered on issues of complex system approaches in urban planning and his work include topics of urban modelling, morphological analyses and rule-based planning.

His expertise is in GIS and computational methods in urban planning and design and his more recent research interests are in distributed urban modelling and simulation and algorithmic problem solving in a design process.

Dr. Joutsiniemi is editor-in-chief of the Finnish Journal of Urban Studies and also holds an Adjunct Professorship in Regional Science at University of Helsinki. Before engaging in academic activities, he worked as an architect-planner in the planning department of the City of Espoo in the Helsinki metropolitan area.

Program

Date: Monday 16 th November 2015		
0830-0900	Registration (Island Suite Lobby area)	
0900-0930	Official welcome to PATREC 2015 Forum <i>Garden/Rottnest Room</i>	Welcome address by Sharon Biermann Opening address by Marion Fulker
0930-1020	Keynote Speaker <i>Garden/Rottnest Room</i>	Boomtown, metapolis and competing neologisms of urban form <u>Anssi Joutsiniemi</u>
1020-1045	Plenary session <i>Garden/Rottnest Room</i>	Infrastructure Planning in Perth: Past, Present and Future <u>P. Newman</u>
1045-1115	Morning Tea Carnac Room	
ROOMS	Session 1a – Garden Room CHAIR: Craig Shepherd	Session 1b – Rottnest Room CHAIR: Brett Hughes
1115-1135	Boomtown goes global: Perth as an internationally connected resource hub <u>K Martinus, T. Sigler</u>	Hype or hope – can future transport technologies ease congestion <u>Y. Sun, L. Gladstone, J. Taplin</u>
1135-1155	Local Government amalgamation and the lack of a metropolitan government: a political geography <u>R. Jones</u>	Funding transport infrastructure to support Perth's growth – options and strategies <u>P. McLeod</u>
1155-1215	Planning system trends <u>N. Foley</u>	Travel Demand Management options <u>B. Smith, C. Babb, B. Hughes</u>
1215-1235	Unsettling planning in Perth: indigenous planning in a boom <u>S. Cox, T. Jones</u>	Managing and motivating sustainable travel behaviour change <u>C. Ferguson</u>
1235-1330	Lunch at Atrium Garden Restaurant	
ROOMS	Session 2a – Garden Room CHAIR: Renlong Han	Session 2 b – Rottnest Room CHAIR: Lisl Van Aarde
1330-1350	Plans, targets and models: mechanism to enhance integration between land use and transport planning <u>S. Biermann, K. Martinus</u>	Did Perth's growing wealth lead to growing transit accessibility? <u>C Curtis, J. Scheurer</u>
1350-1410	Transport and land use functions of four rail station configurations in Perth <u>C. Babb, R. Falconer, D.Olaru, A. Duckworth-Smith, and R. Isted</u>	Accessibility – a Parramatta for Perth? <u>G. McCarney</u>

1410-1430	Testing strategic planning for Activity Corridors through urban design research <u>A. Duckworth-Smith</u>	Public transport patronage success – the role of Park'n'Ride <u>J. Taplin, Y. Huang B. Smith</u>
1430-1450	Cities as systems: node functions of stations and network creation <u>C. Babb on behalf of R. Falconer</u>	Exploring distance decay pattern of transport induced agglomeration around Perth stations <u>Jianhong (Cecilia) Xia, Siti Nurlaela, Dinesh Tuladhar, Ting (Grace) Lin and Todd Litman</u>
1450-1510	Urban modelling for Perth 2050: the dangers and opportunities <u>R. Isted</u>	Cycling in Perth: A case-study of mobile phone fitness applications <u>T. Perkins, D. Blake</u>
1510-1540	Afternoon Tea Carnac Room	
ROOMS	Session 3a – Garden Room CHAIR: Anne-Marie Brits	Session 3b – Rottneest Room CHAIR: Bryce Bunny
1540-1600	The Baby Boomers in Boomtown <u>M. Atkins</u>	Will Perth have enough water for its diverse needs in a drying climate? <u>D. McFarlane</u>
1600-1620	Road Freight activity in Perth's grocery supply chainsy <u>T. Hoffman, C Babb</u>	Perth's natural environment and urban liveability <u>B. Boruff, N. Pauli</u>
1620-1640	Freight and land use planning: noise impacts <u>F. Affleck</u>	Liveable Boomtown <u>F. Bull, P. Hooper</u>
1640-1700	Boom Doom and Gloom <u>F. Haslam McKenzie</u>	Peri-urban open spaces: a missing dish on the Boomtown planning menu? <u>V. Paül</u>
1700-1900	Closure and Cocktail Function Esplanade Resort Pool	

Planning Boomtown and Beyond

Editors: Sharon Biermann and Doina Olaru

Perth's unprecedented current and expected population growth has, in the last half a decade, inspired both the imagining of large-scale urban landscape design scenarios of new forms of housing and an enquiry into the ability of the planning system to manage development through cycles of not only growth, but also downturns. Popularised for Perth in the epic tome, *Boomtown 2050* (Weller, 2009), the term "boomtown" has become synonymous with Perth in a Western Australian, if not Australian context. Whilst the term conjures up impressions of wealth, success and well-being, foregoing scholarly works have warned of the need for vision, foresight and preparedness in planning and managing both the positive and negative development consequences across time and space.

It is now increasingly recognised that planning and implementation has not kept pace with the population growth which has continued despite the effects of the global economic recession towards the end of the first decade of 2000 and the slowing of the construction stage of a resources surge. Traffic congestion, declining productivity, being one of the most expensive cities in the world, drops in liveability rankings and housing unaffordability, are some of the tangible effects policy makers, communities and visitors are confronting. Furthermore, planning and transport policy outcome targets and performance measures are falling short of expected achievements.

Against a backdrop of slow global economic recovery and a deceleration of the construction phase of the local resources boom, there is just not the same level of financial resource availability to supply infrastructure at the rate required by the continuing population growth. Planning and infrastructure, in particular, transport policy prerogatives, have accordingly shifted focus to that of demand-side approaches, deferring the need for more infrastructure investment, making the most of existing infrastructure and finding alternative ways of funding infrastructure.

The purpose of this book is to establish the baseline for demand-side oriented research to better inform policy-makers in planning and managing Perth. Conducted primarily by, but not limited to, PATREC and its academic, government agency and consulting associates and peers, this baseline research has essentially captured international best practice and learning, undertaken preliminary analysis of the Perth current context, assessed the applicability of what has been proposed and applied elsewhere to Perth and providing a range of options with implications for implementation and proposals for more substantive research, building on the baseline.

This book is primarily about Perth, by Perth-based researchers, with and for Perth transport and urban and regional planning policy-makers and potentially, students. While the focus is Perth, the city does not exist as an island. Including Perth "and beyond" is intended to capture spatial and socio-economic interconnectedness with a broader "region" - not only with other parts of the state of Western Australia and Australia, but also globally. Beyond boom is further cognisant of the time element and economic cycles of boom and bust which are short term relative to infrastructure life cycles.

To a limited extent, the wider research community has been drawn in from other parts of Australia and wider, to inform and review the research presented here. Where possible, these contributors have been involved in authoring or co-authoring chapters. It is anticipated that a secondary outcome will be that planning and transport policy-making in other boomtowns benefit from this collection of baseline research.

This book will form the basis and serve as the published proceedings of the PATREC Research Forum 2015 to showcase the research findings. The book will be published by UWA Publishing and is expected to be available by mid-2016.