



**PATREC**

**Planning and Transport Research Centre**

# ANNUAL REPORT

## 2016



[www.patrec.uwa.edu.au](http://www.patrec.uwa.edu.au)



THE UNIVERSITY OF  
**WESTERN  
AUSTRALIA**



Curtin University



mainroads  
WESTERN AUSTRALIA



Department of  
Transport

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## 1 INTRODUCTION

### 1.1 Purpose

The primary purpose of this report is to provide an update of activities conducted in 2016 with a focus on outputs and outcomes achieved.

### 1.2 2016 in Focus

2016 culminated in a **new Collaborative Research Agreement** signed on 8 December 2016 by the six PATREC core partners “for the purposes of conducting collaborative, applied research and teaching in support of policy in the connected spaces of transport and land use planning”. The new agreement includes a three-year rolling funding arrangement to provide a greater level of continuity. This followed an independent review of PATREC during 2015, conducted by Australian Venture Consultants Pty Ltd.

A PATREC **Research Advisory Committee (PRAC)** was established to (1) enhance collaboration and communication amongst partners at the research project level; and (2) introduce an element of formality and rigour to the process of project identification, selection, support, monitoring and dissemination. Comprising at least one senior representative from each partner organisation, chaired by one of the government partners, the PRAC meets three times per annum in advance of Advisory Board meetings, to advise the Board on more detailed research project matters including progress.

On the advice of the PRAC, and following a project prioritisation and selection process, the Advisory Board formally approved **five core funded research projects** to commence in 2016.

The communication focus in 2016 was on the publication of the “PATREC book”, *Planning Boomtown and Beyond*, due for launch in early 2017.

PATREC participated in the successful two-stage bid process for the iMOVE CRC (Intelligent MObility & Vehicle Evolution) with the Stage 1 Bid submitted on 31 March 2016, resulting in the invitation to proceed to Stage 2 with submission on 20 October 2016. The PATREC Advisory Board agreed to contribute most of Main Roads WA and Department of Transport’s PATREC subscription to the iMOVE CRC, which will officially commence in July 2017, and continue for ten years. The proposed priority areas/themes and expected outcomes align well with PATREC research focus areas and provide the opportunity in particular, to develop the freight and network operations research capacity and capability of PATREC. It was announced on 6 March 2017 that this CRC bid, and PATREC’s participation in it, had been successful with Commonwealth funding of \$55 million, Industry funding of \$38m and with Researcher Providers contributing \$17m.

### 1.3 Achievements in Brief

- Establishment of a PATREC Research Advisory Committee.
- Commencement of five core funded research projects.
- ARC LIEF Urban Analytics Data Infrastructure (UADI) Project commenced.
- A further initiative to improve collaboration was the appointment of coordinators at Curtin and ECU.
- 35 academic publications, including 28 book chapters in *Planning Boomtown and Beyond*.
- RAC ‘Accessibility of Activity Centres’ work published in RAC *Horizons* magazine, Oct-Nov 2016 issue and as the basis for the RAC report “Transport Accessibility of Perth’s Activity Centres” published on their website.
- Achievement of an overall stakeholder satisfaction index of 79%.

## 2 RESEARCH

### 2.1 Overview of Project Activity in 2016

The focus of project work in 2016 was on selecting and commencing five substantive research projects, due for completion in 2017 (Table 1). An externally funded ARC LIEF Urban Analytics Data Infrastructure (UADI) Project commenced with a completion date of July 2017. Two seed projects to co-ordinate and determine research needs in the areas of freight and network operations were undertaken in association with the iMOVE CRC Bid submission process.

A small project was undertaken in association with the Centre for Regional Development at UWA “Creating Age Friendly Communities: Local Transport Solutions Project” for the Wheatbelt Development Commission.

**Table 1: Research Project Activity in 2016**

Project	Research Questions and Policy Relevance	Funding and Status
Project 1: Addressing Future Uncertainties of Perth at 3.5 million: What-if Scenarios for Mass Transit	<ul style="list-style-type: none"> <li>Through a classification of station precincts, what is the appropriate infill response (land use mix and intensity) for different station typologies and what are the impacts on patronage?</li> <li>What are the critical density, diversity, and patronage tipping points and threshold levels to inform where and at which stage land-use changes require additional infrastructure or support additional services and when the change is sufficient for viable patronage levels?</li> <li>What are the investments/actions (land-use mix and intensity, infrastructure and non-infrastructure) required to maximise potential synergy (transit and place functions) at particular stations?</li> </ul> <p><i>Policy relevance:</i> Implementation of P&amp;P@3.5 million – LU mix and intensity at stations and AC to support 11% mode share target; ICC relevance; Inform business plans for investment in station precincts</p>	Core funded (\$125,000) Commenced
Project 2: Factors Affecting Travel Behaviour Change	<ul style="list-style-type: none"> <li>What are the social-psychological motivators influencing travel attitudes and behaviours in different demographic groups which need to be accounted for in tailoring interventions for different demographic segments to change behaviour and reach mode share targets?</li> <li>What are the social-psychological attitudes and potential travel behaviours in response to technical and social change?</li> </ul> <p><i>Policy relevance:</i> Will assist in targeting the most appropriate travel demand management interventions for different demographic groups to reach 11% aspirational mode share targets in the transport plan for P&amp;P@3.5.</p>	Core funded (\$100,000) Commenced
Project 3: An Appraisal of Travel Plans and Voluntary Transport Behaviour Projects	<ul style="list-style-type: none"> <li>What standardised evidence-based method should be used to appraise specific travel plans for new developments and VTBC projects in order to prioritise TDM funding?</li> <li>What are the benefits of travel plans for new developments and VTBC programs when included as a component of supply side projects including roads, railways and bike paths?</li> <li>What standardised evidence-based method should be used to monitor and evaluate the impacts of travel plans and VTBC projects in order to justify TDM funding as well as make subsequent funding decisions?</li> </ul> <p><i>Policy relevance:</i> Will assist in the identification and appraisal of a targeted suite of TDM instruments that will be necessary in managing congestion. In particular, travel plans and DOT’s flagship voluntary travel behaviour change (VTBC) program, Your Move.</p>	Core funded (\$55,000) Commenced

Project	Research Questions and Policy Relevance	Funding and Status
Project 4: Understanding Travel Behaviour Patterns and Trends	<ul style="list-style-type: none"> <li>What are the spatial-temporal transport usage patterns as evident from SmartRider data in relation to socio-economic factors?</li> <li>What are the origin-destination travel patterns as determined from SmartRider and other available data and how do they compare to modelled patterns?</li> <li>Are there any new patterns of travel which can be discovered through data mining of SmartRider data?</li> </ul> <p><i>Policy relevance:</i> Performance monitoring in near real time – could feed into the Directions/P&amp;P@3.5 Annual Report Card; PT OD matrix validation, improve strategic modelling assumptions; inform PARTS survey sample frame, supporting evidence-based policy formulation.</p>	Core funded (\$195,000) Commenced
Project 5: Understanding Road Freight Demand Generation Patterns Per Industry Type – Perth Road Freight Analysis	<ul style="list-style-type: none"> <li>What are the freight patterns generated by different types of industrial activity in metropolitan Perth?</li> <li>What is the freight generating potential of businesses specialising in warehousing, distribution and logistics, in strategic areas such as Kewdale-Forrestfield-Hazelmere and the port precincts?</li> <li>Why do businesses of various types locate in particular areas, and what are the barriers and costs associated with relocation to other areas, including new industrial zones, which might offer economic benefits?</li> <li>What is the potential for improved use of rail for metropolitan freight by the various sector activities?</li> </ul> <p><i>Policy relevance:</i> Will provide much-needed data on road freight activity (scale, nature, origin-destination pattern and growth trends) and support planning for economic clusters</p>	Core funded (\$105,000) Commenced
ARC LIEF Urban Analytics Data Infrastructure (UADI) Project	<p>After a prolonged grant application process, this year-long project, officially commencing in July 2016 and extending until June 2017, led by Prof Abbas Rajabifard (University of Melbourne, Centre for Spatial Data Infrastructures and Land Administration) in collaboration with 11 other investigators from five other Australian universities, aims to develop an urban analytics data infrastructure that builds on the Australian Urban Research Infrastructure Network (AURIN).</p> <p>PATREC's role is to 1) develop and implement a fundamental technical framework for Urban Transport infrastructure, modes, quantity and quality and 2) develop an open API and necessary web-services related to Urban Transport domain.</p>	Externally funded (\$90,000) Commenced
iMOVE Bid-related seed projects:	<ul style="list-style-type: none"> <li>Network operations research needs</li> <li>Freight industry research needs</li> </ul>	Core funded (\$50,000) Commenced
Creating Age Friendly Communities: Local Transport Solutions Project	<p>PATREC contributed the component of Evaluation of age-friendly community pilot transport services to the project which was used to inform the development of an Integrated Transport Strategy for the Wheatbelt to allow older residents across the Wheatbelt to better access key services and infrastructure.</p>	Externally funded (\$7,000) Completed

### 3 KNOWLEDGE TRANSFER

#### 3.1 PATREC Seminars

Part of PATREC's role is ensuring knowledge transfer through academic and non-academic publications, connection events and an information portal (website) as a reliable and accessible resource for researchers and policy makers. Four seminars were arranged and hosted by PATREC, some in association with others (Table 2). Two of the seminars trialled a new approach for those who have attended conferences to share the learning with short, concise feedback papers presented. The feedback has been positive and more of these seminars will be arranged in future.

**Table 2: PATREC Hosted (and Co-hosted) Events**

Speaker	Presentation Title	Event	Date	Attendees
<b>Prof Edwards Chung</b> , Director of the Smart Transport Research Centre at the Queensland University of Technology	<b>Use of Bluetooth and Wifi for Measuring Vehicles and People Movements</b>	PATREC Seminar	5 May 16	29
<b>Assoc Prof Doina Olaru</b> , Management and Organisations, UWA Business School	Travel Demand at a Multidisciplinary Crossroad	<b>PATREC Seminar: World Transport Research Highlights: Feedback from WA Participants at the 14th World Conference on Transport Research (WCTR)</b>	6 Sep 16	26
<b>Dr Renlong Han</b> , Team Leader Transport Modelling, Integrated Transport Planning, Dept of Transport	Integrated Land Use and Transport Modelling			
<b>Hendrik Braun</b> , PhD Candidate, UWA Business School	WCTR Shanghai Review: WCTRS-Y and Selected Papers on Road Freight Mapping			
<b>Dr Jianhong (Cecilia) Xia</b> , Senior Lecturer, Department of Spatial Sciences, Curtin University	WCTR Shanghai Review: Airline Competition and Efficiency			
<b>Dr Chao Sun</b> , Research Fellow, PATREC	Macroscopic Fundamental Diagrams			
<b>Qian (Chayn) Sun</b> , PhD Candidate, Department of Spatial Sciences, Curtin University	Framework for Investigating Older Adults' Driving Behaviours and the Underlying Cognitive Mechanisms			
<b>Dr Jack Barton</b> , AURIN Urban Data and e-Research Facilitator, Australian Urban Research Infrastructure Network (AURIN)	<b>AURIN Seminar and Workshop</b>	Australian Early Career Urban Research Network (AECURN)/PATREC seminar	6 Oct 16	40
<b>Brett Hughes</b> , Executive Director, Transport Strategy & Reform, Department of Transport	ITS World Congress - Policy Perspective	<b>PATREC/ Department of Transport Seminar: Intelligent Transport Systems (ITS) Conference Learnings</b>	29 Nov 16	48
<b>Michael Pal</b> , Principal Logistics Analyst, Fremantle Ports	ITS World Congress - Port and Maritime Perspective			
<b>Ms Anne Still</b> , Senior Manager, Policy and Research, RAC	ITS World Congress - User Perspective			
<b>Steve Atkinson</b> , Strategy and Communications, Main Roads WA	ITS World Congress - Main Roads WA Perspective			
<b>Dr Chao Sun</b> , Research Fellow, PATREC	Australian Transport Research Forum - Road to Autonomous Vehicles in Australia: A comparative literature review			
<b>Prof Sharon Biermann</b> , Director, PATREC	European Transport Conference - ITS Highlights			

### 3.2 Research Outputs

The focus of PATREC's research outputs in 2016 was on a book, *Planning Boomtown and Beyond*. A total of 28 chapters written by PATREC associates have been published in this book, edited by Sharon Biermann, Doina Olaru and Valeria Paül (Table 3). The book will be printed and launched in 2017.

A total of 11 conference papers were presented with five published in proceedings (Table 3). Eight journal papers and book chapters were submitted for publication (Table 4).

**Table 3: Research Outputs**

Publication Title	Author/s	Publication Date
<b>RESEARCH PROJECT TECHNICAL REPORTS COMPLETED</b>		
Creating Age Friendly Communities: Local Transport Solutions Project (report prepared for the Wheatbelt Development Commission)	Haslam McKenzie, Atkins, Burham, Smith & Huang	Oct 2016
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
<b>INDEPENDENT REVIEWS COMPLETED</b>		
Independent Review: Network Performance Analysis for Perth Congestion Response 2016 (ARRB) (for MRWA internal use only)	Sun, Y. & Biermann, S	Sep 2016
<b>JOURNAL PAPERS PUBLISHED</b>		
Enhanced Huff Model for Estimating Park and Ride (PnR) Catchment Areas in Perth, WA, <i>Journal of Transport Geography</i> , 54, 336-348	Lin, T. (G.), Xia, J. (C.), Robinson, T., Olaru, D., Smith, B., Taplin, J., & Cao, B	Jun 2016
Innovative value capture based rail transit financing: an opportunity for emerging transit cities of India. <i>Journal of Sustainable Urbanization, Planning and Progress</i> , 1(1).	Jillella, S. S. K., & Newman, P	2016
<b>BOOK CHAPTERS</b>		
Vehicle Routing and Break Scheduling by a Distributed Decision Making Approach. In D. Mattfeld, T. Spengler, J. Brinkmann & M. Grunewald (Eds.), <i>Logistics Management</i> (pp. 273-284): Springer International Publishing	Kopfer, H., Meyer, C. M., & Braun, H.	
Emerging value capture innovative urban rail funding and financing: a framework. <i>Handbook of Research on Emerging Innovations in Rail Transportation Engineering</i> (pp. 130-145).	Jillella, S. S. K., Sitharam, T. G Matan, A. & Newman, P.	
<b>In S. Biermann, D. Olaru and V. Paül. (Eds) (2016). <i>Planning Boomtown and Beyond</i>. Perth, WA: UWA Publishing</b>		
Boom: Boon or Doom?	Haslam McKenzie, F.	
Boomtown Globalising: Perth as an Internationally Connected Resource Hub	Martinus, K. & Sigler, T.	
Understanding the Demographic Character of Perth's Population	Davies, A.	
Boomers in Boomtown: Age-friendly Planning in Australia	Atkins, M.	
Local Government Amalgamation and the Lack of a Metropolitan Government: A Political Geography	Jones, R.	
Unsettling Planning In Perth: Indigenous Planning in a Boom	Jones, T., Cox, S. & Cozens, P.	
The Triumph of Suburbia? The (In)Ability of Planning to Contain the 'Great Australian Dream'	Maginn, P. J.	
Infrastructure Planning in Perth: Past, Present and Future	Newman, P.	
Will Perth Have Enough Water for its Diverse Needs in a Drying Climate?	McFarlane, D.	
Natural Environments, Ecosystem Services and Green Infrastructure: Planning for Perth's 'Green' Matrix	Pauli, N. & Boruff, B.	
Periurban Open Spaces: A Missing Dish on the Boomtown Planning Menu?	Paül, V.	
Liveable, Sustainable and Walkable Boomtown	Bull, F. & Hooper, P.	
Understanding Cycling Behaviour in Boomtown Perth	Perkins, T. & Blake, D.	

Specific Road Safety Issues in Perth, Western Australia	Meuleners, L., Fraser, M., Govorko, M. & Palamara, P.	
Boundary Objects as Tools for Integrated Land Use-Transport Planning	Biermann, S. & Martinus, K.	
Mean Streets or High Streets? Challenges of Implementing Strategic Planning for Activity Corridors in Perth	Duckworth-Smith, A.	
Transport and Land Use Functions of Four Rail Station Configurations in Perth	Babb, C., Falconer, R., Oлару, D., Duckworth-Smith, A. & Isted, R.	
Cities as Systems: Node and Place Conflict across a Rail Transit Network	Falconer, R., Babb, C. & Oлару, D.	
Road Freight Activity in Perth's Grocery Supply Chains	Hoffman, T. & Babb, C.	
The Role of Industry in Promoting Evidence Based Policy - A Case Study of the Freight and Logistics Council of WA in Planning for Freight Noise	Affleck, F., Jones, E. & May, K.	
Does Perth's Growing Wealth Lead to Better Public Transit Accessibility?	Curtis, C. & Scheurer, J.	
Public Transport Patronage Success - The Role of Park'n'Ride	Smith, B. Huang, Y. & Taplin, J.	
Hype or Hope – Can Future Transport Technologies Ease Congestion?	Sun, Y., Gladstone, L. & Taplin, J.	
Managing and Motivating Sustainable Travel Behaviour Change	Ferguson, C.	
Travel Demand Management Options for Perth	Babb, C., Smith, B., Hughes, B. & Falconer, R.	
The Role of Parking in Limiting Traffic Growth and Congestion	Richardson, E.	
Easing Congestion Through Employment Decentralisation: A Parramatta (or Two) for Perth?	McCarney, G. & Biermann, S.	
Funding Transport Infrastructure to Support Perth's Growth – Options and Strategies	McLeod, P.	
<b>OTHER</b>		
Commuting Across Perth and Peel: Unpacking patterns, measures and policy implications. <i>UWA/Committee for Perth FactBase Bulletin 46</i>	Martinus, K. & Biermann, S.	Mar 2016
<b>CONFERENCE PAPERS PRESENTED AND PUBLISHED IN PROCEEDINGS</b>		
Using micro simulation of city traffic to determine a cordon charge based on marginal network social cost, <i>14<sup>th</sup> World Conference in Transportation Research</i> , Shanghai, China.	Sun, Y., & Taplin, J.	Jul 2016
Do commuters behave consistently when identifying their preferred and least preferred mode within the context of uncertainty? <i>14<sup>th</sup> World Conference in Transportation Research</i> , Shanghai, China.	Huang, Y., Smith, B. & Oлару D.	Jul 2016
Influence of variability of travel time on train station choice for park-and-ride users, <i>14<sup>th</sup> World Conference in Transportation Research</i> , Shanghai, China.	Chen, C., Xia, J., Smith, B., Oлару, D., Taplin, J. & Han R.	Jul 2016
Integrating policy objectives to transport and land use modelling, <i>14<sup>th</sup> World Conference in Transportation Research</i> , Shanghai, China.	Meng, L. & Han, R.	Jul 2016
Heterogeneous Substitution Patterns based on Current Mode Choice, <i>Australasian Transport Research Forum</i> , Melbourne.	Huang, Y., Smith, B., Oлару, D.	Nov 2016
<b>CONFERENCE PAPERS PRESENTED</b>		
Integration of Land use and Transport Infrastructure for Perth, paper presented at the <i>7<sup>th</sup> Annual WA Major Projects Conference</i> , Perth	Biermann, S.	Apr 2016
Issues for Freight and Logistics in a Growing State, paper presented at the <i>7<sup>th</sup> Annual WA Major Projects Conference</i> , Perth	Affleck, F.	Apr 2016
Data mining approaches to extract information from secondary sources for modelling pallet road transport, <i>14<sup>th</sup> World Conference in Transportation Research</i> , Shanghai, China	Braun, H. & Oлару D.	Jul 2016
Revenue management in road freight transport: Capacity control and dynamic request integration under profit maximisation, <i>14<sup>th</sup> World Conference in Transportation Research</i> , Shanghai, China	Braun, H.	Jul 2016



No black boxes please, we're decision-makers! A sketch-modelling approach to mass rapid transport demand estimation, paper presented at the <i>2016 European Transport Conference</i> , Barcelona, Spain	Biermann, S., Oлару, D., McCarney G. & Piggott L.	Oct 2016
Road to autonomous vehicles in Australia: A comparative literature review, <i>Australasian Transport Research Forum</i> , Melbourne	Sun, Y., Oлару, D., Smith, B., Greaves, S., & Collins, A.	Nov 2016

**Table 4: Journal Papers and Book Chapters Submitted in 2016 for Publication**

Title of Paper	Authors
A Literature Survey and Future Prospects of Revenue Management in Road Freight Transport. <i>Transport Reviews</i> (resubmitted to <i>Journal of Physical Distribution &amp; Logistics Management: Special Issue</i> )	Braun, H.
Adapting principles of developmental biology and agent-based modelling for automated urban residential layout design (accepted for publication in 2017, <i>Journal of Environment and Planning B: Urban Analytics and City Science</i> )	Sun, Y., & Taplin, J.
Assessing the accessibility of activity centres and their prioritisation: A case study for Perth Metropolitan Area (accepted for publication in 2017, <i>Journal of Urban, Planning and Transport Research</i> )	Moniruzzaman, Md., Oлару, D. & Biermann, S.
Combining samples to offset nonresponse and respondent biases (under review, <i>Case Studies in Transport Policy</i> )	Oлару, D., Smith, B. & Jabeen, F.
Electric Vehicles Adoption: Environmental Enthusiast Bias in Discrete Choice Models (accepted for publication in 2017, <i>Transportation Research D</i> , 51, 290-303).	Smith, B., Oлару, D., Jabeen, F. & Greaves, S.
Revenue management in road freight transport: Capacity control and dynamic request integration under profit maximisation (resubmitted to <i>Journal of Transportation Science</i> )	Braun, H.
Road to autonomous vehicles in Australia: A comparative literature review (under review, <i>Journal of Road and Transport Research</i> )	Sun, Y., Oлару, D., Smith, B., Greaves, S., Collins, A.
Strategic planning for employment self-containment in metropolitan sub-regions (accepted for publication in 2017, <i>Journal of Urban Policy and Research</i> )	Martinus, K. & Biermann, S.

### 3.3 Research Impact

#### **Research Project Outcome**

A high level summary of the findings of the 'Accessibility of Activity Centres' project, conducted for the RAC in 2015, was published in the RAC *Horizons* magazine, Oct-Nov 2016 issue and used as the basis for the RAC report "Transport Accessibility of Perth's Activity Centres" published on their website. In addition, the RAC presented the detailed results of the study with the Transport Portfolio as input to the *Perth and Peel @3.5million Transport Plan*.

#### **Stakeholder Satisfaction Survey Results**

An on-line survey, comprising nine questions, was developed using Qualtrics to provide feedback to the Director and Board on the level of satisfaction of PATREC partners with the performance of PATREC. It is the intention to repeat this survey at least annually as part of the performance monitoring process.

The first survey was conducted in February 2017, limited to Board and PRAC members to test the survey instrument and also to set the baseline satisfaction level. For the purpose of providing the baseline satisfaction level as a KPI (Table 12), the degree to which stakeholders agreed with the statement "Overall, I am satisfied with PATREC's performance" (strongly agree, somewhat agree, somewhat disagree, strongly disagree) was converted to a percentage satisfaction rate. A baseline satisfaction index of 79% was achieved. Results for all nine questions are used for more detailed reporting to the Board.

The survey has the potential to be extended more widely to include Steering Committee members and for gauging the level of satisfaction with performance in individual projects.

## Awards

- Yuchao Sun (PATREC Research Fellow) was awarded his PhD (UWA) in March 2016.
- Hendrik Braun (PhD Student) won a young researchers Prestige Grant for a single authored paper at the 14th World Conference of Transport Research, Shanghai, China, July 2016.

## 4 PEOPLE AND RESOURCES

### 4.1 Staffing

With leadership, administration and coordination by a small PATREC core team (Table 5), a much wider team of PATREC project research associates from across the partner universities and with some support from adjuncts, consultants (Table 6) and PhD students (Table 7), were involved in conducting policy-informing, applied research. Through the mechanism of project steering committees (Table 8), researchers were supported and enabled by a dedicated team of agency stakeholders who ensured that PATREC research is well-aligned with policy objectives and that the research outcomes are well-communicated within the agencies and more broadly if required.

**Table 5: Research Administration, Development, Coordination and Management**

PATREC Office		
Prof Sharon Biermann	0.4 FTE	Director
Dawn Woods	0.8 FTE	Centre Administrator
Research Development, Coordination and Management		
Prof Sharon Biermann (PATREC)	0.6 FTE	Director
Dr Chao Sun (PATREC)	0.4 FTE	PATREC@UWA
Mike Ridout (Curtin)	0.4 FTE	PATREC@Curtin
Dr Catherine Ferguson (ECU)	0.2 FTE	PATREC@ECU

**Table 6: PATREC Project Research Associates**

PATREC Research Assoc.	Faculty/School/Centre	Uni.	PATREC Research Assoc.	Faculty, Dept, School	Uni.
Mike Ridout	Spatial Sciences	Curtin	A/Prof Rachel Cardell-Oliver	Computer Science	UWA
Dr Ulanbek Turdukulov	Spatial Sciences	Curtin	Dr Wei Liu	Computer Science	UWA
Dr Simon Moncrieff	Spatial Sciences	Curtin	Dr Jianxin Li	Computer Science	UWA
Tristan Reed	Spatial Sciences	Curtin	Tim Perkins	Centre for Planning	ECU
Dr S Zhang Nau	Information Systems	Curtin	Dr Cath Ferguson	Business and Law	ECU
E/Prof Geoff West	Spatial Sciences	Curtin	Dr David Lamb	Business and Law	ECU
Jake Schapper	Planning & Geog.	Curtin	Prof Craig Standing	Business and Law	ECU
Dr Courtney Babb	Planning & Geog.	UWA	Dr Susan Standing	Business and Law	ECU
Dr Chao Sun	PATREC	UWA	Gary McCarney	Adj Research Fellow	UWA
A/Prof Doina Olaru	Business School	UWA	Laura Gladstone	Consultant	-
Dr Brett Smith	Business School	UWA	Tim Hoffman	THAdvisory	-
Ying Huang	Business School	UWA	Paul McLeod	Adj Prof UWA	UWA
Hendrik Braun	Business School	UWA	John Taplin	E/Prof UWA	UWA
A/Prof Paul Bergey	Business School	UWA			

**Table 7: PATREC PhD Top-up Scholarships since 2013**

Name and institution	Status	Topic
James McIntosh (Curtin)	Awarded in 2014, completed in 2015	Infrastructure Funding
Sai Kumar (Curtin)	Awarded in 2014, expected completion 2017	Infrastructure Funding
Daniel McDonald (ECU)	Awarded in 2014, withdrew in 2015	Accessibility/Vampire Index
Hendrik Braun (UWA)	Awarded in 2015, in second year	Freight

**Table 8: Project Steering Committee Participation**

Agency	Project 1	Project 2	Project 3	Project 4	Project 5
DoP	Craig Shepherd Damien Martin		Craig Shepherd	Damien Martin	Craig Shepherd
DoT	Renlong Han Sue Hellyer	Simon Grieve Renlong Han	Sue Hellyer Alison Bunbury Andrew Wilkinson	Renlong Han Sue Hellyer	Anne-Marie Brits Caroline Elliott
MRWA		Kamal Weeratunga	Mehdi Langroudi	Wes Soet	Wes Soet
PTA	Louise Howells Jamie Mullins	Tom Pacy	Simon Cox Louise Howells	Tom Pacy/ Martin White	
Treasury	Coan Harvey		Coan Harvey Vivian Pinter	Laura Cook	

## 4.2 Finances

Table 9 provides the status of YTD actual income and expenditure against budget as at the end of the financial year (31 December 2016). Total income of \$581,191 was 10.3% lower than budget (\$648,000) due to lower than expected external income. External income earned was from the final Mass Transit Study payment and the ARC LIEF payment. Total expenditure was \$934,927 which was 21% under budget due to a delay in the distribution of project-related funds. The closing balance of funds in PATREC's account was \$672,849 which was 37.8% greater than budgeted.

**Table 9: Financial Summary for 2016**

PATREC Budget 2016	YTD Actual 31/12/2016	Budget 2016	Variance Budget vs Actual
<b>INCOME</b>			
Collaborating Partners - Core funding	420,000	420,000	
Other Research Grants & Contracts	136,148	200,000	-63,852
Accrued Interest	25,043	28,000	-2,957
<b>Total Income</b>	<b>\$581,191</b>	<b>\$648,000</b>	<b>-\$66,809</b>
<b>EXPENDITURE</b>			
PATREC Office	191,908	199,420	7,512
Research	743,019	986,900	243,881
<b>Total Expenditure</b>	<b>\$934,927</b>	<b>\$1,186,320</b>	<b>\$251,393</b>
<b>YTD BALANCE</b>	<b>-\$353,736</b>	<b>-\$538,320</b>	<b>\$184,584</b>
<b>Balance Brought Forward from 2015</b>	<b>\$1,026,585</b>	<b>\$1,026,585</b>	<b>0</b>
<b>CLOSING BALANCE (incl Balance B/F)</b>	<b>\$672,849</b>	<b>\$488,265</b>	<b>\$184,584</b>

## 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. Peter Woronzow, replaced Stephen Troughton who resigned from the position of Managing Director of Main Roads to take up a position in New South Wales (Table 10).

**Table 10: PATREC Advisory Board Members**

2015	2016
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 Peter Woronzow, Acting Managing Director, Main Roads Western Australia
Mr Graeme Doyle, Managing Director, Policy Planning and Investment, Department of Transport	Mr Graeme Doyle, Managing Director, Policy Planning and Investment, Department of Transport
Prof Keith Hampson, Chief Executive Officer, SBEnrc, Curtin University	Prof Keith Hampson, Chief Executive Officer, SBEnrc, Curtin University
Mr Tim Perkins, Program Director Centre of Planning, ECU, 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 (with Prof Alison Preston standing in while Prof Tonts was on sabbatical)
Prof Sharon Biermann, Director PATREC	Prof Sharon Biermann, Director PATREC

### 5.2 Establishment of PRAC

The PATREC Review, and feedback and discussion process which followed, highlighted the need for an element of formality and rigour to be introduced in the identification, selection, support, monitoring and dissemination of research projects.

At its meeting on the 21 April 2016 (#43), the Advisory Board agreed to the establishment of the PATREC Research Advisory Committee (PRAC) with the purpose of strengthening coordination amongst the PATREC partners in relation to the identification, planning, prioritisation, conducting, progress monitoring and promoting core funded applied research projects.

Comprising one to two senior representatives from each partner organisation, chaired by a nominated representative of one of the government partners, elected by the Advisory Board, the objectives of PRAC are to:

- introduce an element of formality and rigour to the research project identification, selection, support, monitoring and dissemination process;
- enhance communication amongst partners; and
- advise the Advisory Board on project level matters, allowing the Advisory Board to focus on strategic matters.

Mr Brett Hughes was elected as the inaugural Chair of the PRAC (Table 11).

**Table 11: PATREC Research Advisory Committee Members**

Name	Organisation
Brett Hughes (Chair)	Department of Transport
Steve Beyer	Department of Transport
Douglas Morgan	Main Roads WA
Kamal Weeratunga (for Tony Earl)	Main Roads WA
Damien Martin	Department of Planning
Craig Shepherd	Department of Planning
Owen Thomas	Public Transport Authority
Prof Keith Hampson	Curtin University
Mike Ridout	Curtin University
Tim Perkins	Edith Cowan University
Dr Cath Ferguson	Edith Cowan University
Assoc Prof Doina Olaru	The University of Western Australia
Dr Brett Smith	The University of Western Australia

## 6 PERFORMANCE AGAINST KPIS AND TARGETS

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. The number of performance indicators has been reduced to essential academic and policy impact indicators with focus on outputs and outcomes rather than inputs. A new indicator has been introduced, that of a PATREC satisfaction index.

**Table 12: Performance against Targets 2016**

Performance Indicator	Target 2016	Achieved 2016	Evidence
<b>Academic Performance Indicators</b>			
Number of journal papers published	3	2	Table 3
Number of peer-reviewed book chapters published	10	28	Table 3
Number of peer-reviewed conference papers published in proceedings	7	5	Table 3
Number of peer-reviewed books published	1	1	Table 3
Number of top-up sponsored PhD graduated	1	0	Table 7
Value (\$) of external research funding secured	\$200,000	\$136,000	Table 9
<b>Policy Impact Performance Indicators</b>			
Number of high impact, policy-informing projects completed	1	0	
Number of substantive Technical Reports/Working Papers published	5	3	Table 3
Number of PATREC Perspectives published on PATREC website	1	0	
Number of presentations at PATREC and other connection events	5	16	Table 2 (events) and Table 3 (conference presentations)
Number of connection events arranged and held	2	4	Table 2
Number of short courses, unit contributions presented	2	2	ECU/UWA lectures
<b>Overall stakeholder satisfaction indicator</b>	-	79%	Section 3.3

## ANNEXURE A: PROJECTS UNDERTAKEN FROM 2013

Project	Funding Sources and \$	Status
Developer contributions for transport – Baseline literature review	\$14,000 – Non-core (RAC)	Completed – 2013
Independent Transport Modelling Review	\$56,000 – Core funds \$72,000 – Non-Core (MRWA)	Completed
Congestion Abatement through Travel Demand Management	\$64,000 – Core funds	Completed
AURIN WA Data Hub	\$200,000 – Non-core	Completed
WA Freight Studies - Stage 1 – Research opportunities	\$13,000 – Core funds \$10,000 – Non-core (Freight Logistics Council)	Completed
WA Freight Studies – Stage 2 <ul style="list-style-type: none"> <li>Urban – PILOT – Retail Supply Chains – Freight Vehicle Usage of Perth Metropolitan Roads</li> <li>Regional – Grain Freight Activity on Southern Wheatbelt Roads</li> </ul>	\$55,250 – Core funds	Completed
Review of Infrastructure Planning and Financing Options for WA	\$35,000 – Core funds	Completed
Infrastructure Funding Research Priorities and Project Planning	\$30,000 – Core funds	Completed
Stated Preference Survey – Experimental Design	\$68,700 – Core funds	Completed – 2014
Activity Centre Accessibility	\$70,000 – Non-core (RAC)	Completed – 2014
Activity Centres: Making Land Use and Transport Work – Stations in or near freeway medians – reconciling node/place conflicts	\$185,000 (\$80,000 – Core funds; \$105,000 – Main Roads)	Completed – 2014
Mass Rapid Transit @3.5	\$466,600 (\$385,600 – Non-core funds: Dept of Transport; \$81,000 – Core funds)	Completed – 2015
Seed Projects: <ul style="list-style-type: none"> <li>Use of Mobile Fitness Application Data to Model Bicycle Usage Patterns (\$5K)</li> <li>Suburbs Research for Australian Cities (\$7.5K)</li> <li>Transport Technology Futures (\$5K)</li> <li>Travel Behaviour Change(\$4.5K)</li> <li>Employment self-sufficiency (\$5K)</li> </ul>	\$25,000 – Core funds	Completed – 2015
ARC LIEF – Urban Analytics Data Infrastructure	\$90,000 (\$70,000 Non-core funds: \$50,000 ARC; \$20,000 UWA; \$20,000 Core funds)	Commenced – 2016
Project 1: Addressing Future Uncertainties of Perth at 3.5 million: What-if Scenarios for Mass Transit	\$125,000 Core funds	Commenced – 2016
Project 2: Factors Affecting Travel Behaviour Change	\$100,000 Core funds	Commenced – 2016
Project 3: An Appraisal of Travel Plans and Voluntary Transport Behaviour Projects	\$55,000 Core funds	Commenced – 2016
Project 4: Understanding Travel Behaviour Patterns and Trends	\$195,000 Core funds	Commenced – 2016
Project 5: Understanding Road Freight Demand Generation Patterns Per Industry Type – Perth Road Freight Analysis	\$105,000 Core funds	Commenced – 2016
iMOVE Bid-related seed projects: <ul style="list-style-type: none"> <li>Network operations research needs</li> <li>Freight industry research needs</li> </ul>	\$25,000 Core funds \$25,000 Core funds	Completed – 2016

Project	Funding Sources and \$	Status
iMOVE CRC	Industry, research, Commonwealth funds	Bid submitted – 2016; successful; due to commence mid-2017
RAC Pulse of Perth	RAC-PATREC program funds	Proposal under development; due to commence in 2017
German – Australian collaboration - Agent-based integrated land use-transport modelling	German funding; Academy of Science Regional Cooperation Funds	2X Grant applications submitted; due to commence late 2017