



**PATREC**

# **ANNUAL REPORT**

**2014**



## **Planning and Transport Research Centre (PATREC)**

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# 1 INTRODUCTION

## 1.1 Background

The end of 2014 essentially marks the half-way point in the current five year Collaborative Research Agreement. Executed in April 2012, the Agreement was constituted “for the purposes of conducting collaborative research and teaching in the areas of transport policy and planning and urban and regional planning” and signed by the collaborating partners (UWA, Curtin University (Curtin), Edith Cowan University (ECU)), Western Australian Planning Commission (WAPC), the Department of Transport (DoT), Main Roads Western Australia (MRWA)).

## 1.2 Focus

By the end of 2012, a new Director had been appointed and the focus in 2013 was establishing the research priorities through a stakeholder engagement process, assembling the core research team and initiating a number of research projects. 2014 has been primarily about delivering a series of baseline research projects which essentially establish and understanding of the current (local) situation through data collection and analysis, a literature review to establish international trends and best practice and a view of applicability of the best practice learning to Perth and WA. In addition to mobilising research capacity to deliver baseline research projects, there has been a focus on presenting PATREC outwards to a wider audience through a series of PATREC seminars and the launch of PATREC Perspectives, published on the web site to communicate in an accessible format, research project overviews, substantiated research ideas which could evolve from exploratory to full research projects, or, key trend monitoring updates.

## 1.3 Purpose

The primary purpose of this report is to provide an update of activities conducted in 2014 with a focus on outcomes achieved.

## 1.4 Achievements in Brief

- Two projects completed
  - Congestion Abatement through Travel Demand Management – Review of Measures and Tools
  - Independent Transport Modelling Review
- Three new projects commenced
  - Stated Preference Survey – Experimental Design (Department of Planning (DoP))
  - Accessibility of Activity Centres (RAC)
  - Activity Centres - Making Land Use and Transport Work: Stations in or near freeway medians – reconciling node/place conflicts (MRWA, DoP, DOT, PTA)
- Baseline projects developed for lagging program areas
  - Infrastructure funding
  - Freight
- More than 350 delegates attended 11 PATREC seminars/events
- PATREC produced and/or was acknowledged in 7 publications

- “PATREC Perspectives” series launched to communicate research findings in an accessible format, with two issues published on the PATREC web site
  - Perth Public Transport Patronage: “Off The Rails” or “Back On Track”?
  - GOING PLATINUM! A new approach to transport modelling in Perth
  
- PATREC PhD Top-up scholarships
  - Izumi Hart graduated from Murdoch in 2014
  - Three new scholarships continued
    - James McIntosh (completion scholarship) – CUSP, Curtin
    - Sai Kumar (full 3 year scholarship) – CUSP, Curtin
    - Daniel McDonald (part-time 2 year scholarship) - ECU
  
- The core financial contribution of \$230,000 from the collaborating partners leveraged additional external research funding of \$240,660.

## 2 RESEARCH

### 2.1 Overview of Projects

The general focus of work in 2014 was on undertaking baseline research in the form of literature reviews, baseline data analysis and consolidation of previous work as the basis for proposing more substantial research with existing and new funding partners. The four programs (1. integrated land use-transport planning and policy; 2. land use-transport modelling, economics and information; 3. infrastructure funding and implementation and 4. regional planning and transport) identified in the Business Plan 2014, remained the framework for scoping the projects of the Centre.

**Table 1: Overview of programs/projects completed, commenced and continuing in 2014**

<i>Program/Project</i>	<i>Status</i>	<i>Funding \$</i>
Independent Transport Modelling Review	Completed	56K - Core funds 72K - Non-Core (MRWA)
Congestion Abatement through Travel Demand Management	Commenced & Completed	64K - Core funds
Stated Preference Survey – Experimental Design	Commenced	69K - Core funds
Activity Centre Accessibility	Commenced	70K - Non-Core (RAC)
AURIN WA Data Hub	Commenced	200K - Non-core
Activity Centres: Making Land Use and Transport Work	Commenced	105K - Non-core (MRWA) 80K - Core funds
WA Freight Studies	Commenced	13K - Core funds 10K – Non-core (Freight Logistics Council)
Infrastructure Funding	Commenced	35K - Core funds
Seed funding - Use of Mobile Fitness Application Data to Model Bicycle Usage Patterns	Commenced	5K - Core funds



### 2.2 Overview of Completed Projects

<b>Project name</b>	<b>Transport Modelling Review: Independent Review</b>
Program Area	Land use-transport modelling, economics and information
Steering Committee	Wes Soet (MRWA), Renlong Han (DoP), Craig Wooldridge (DOT), Steve Piotrowski (consultant to DOT), Coan Harvey (Treasury), Chris Watts (PTA)
Research Team	Doina Olaru (UWA), John Taplin (UWA), Sharon Biermann (UWA), Michael Taylor (University of South Australia)
Independent Reviewer	Prof Michiel Bliemer, Institute of Transport and Logistics Studies (ITLS), The University of Sydney
Duration	November 2013 – May 2014
Purpose	<p>Responding to transport modelling needs, capabilities and gaps, identified through a rigorous transport modelling stakeholder engagement process, the review examined current transport modelling practices in Perth, benchmarking them against best practice in Australia and overseas. Offering a framework for the evaluation of modelling approaches, a comparison of the two current, more strategic transport models, operated by the state government, with other approaches in operation around the world, the review developed and analysed three possible options for model development, suggesting a pathway for a new best practice approach for implementation.</p> <p>Specific objectives of the review were to address the identified needs relating to:</p> <ul style="list-style-type: none"> <li>• the place and application of macroscopic, mesoscopic and microscopic models;</li> <li>• incorporating land freight movements into the integrated transport model;</li> <li>• land-use and transport interaction;</li> <li>• land-use inputs and other data requirements;</li> <li>• level of disaggregation and segmentation – scale, zonal, socio- economic and modal</li> </ul>

	<p>attributes;</p> <ul style="list-style-type: none"> <li>• incorporating behavioural responses to policies and demand management measures; and</li> <li>• incorporating dynamics (treatment of time).</li> </ul>
Findings	<p>Three options for model development to address needs on the basis of current state-of-the-art international advances in transport modelling were identified and evaluated:</p> <ol style="list-style-type: none"> <li>1. continued (separate) development of both STEM and ROM24 models, providing specialised services to current clients, but with improved integration;</li> <li>2. gradual development into a single modelling system, which incorporates the top features of the current two models, plus additional best practice developments; and</li> <li>3. development of a new best practice modelling system, with strong feedbacks from the transport model to the land-use model and from the dynamic traffic assignment to the previous stages of the strategic model, also integrating a freight component.</li> </ol> <p>The third option, named “PLATINUM” (Perth LAnd and Transport INtegrated Urban Model), was recommended as the preferred solution for addressing the modelling needs in WA, in line with best international practice and also avoiding duplication and other resource inefficiencies, yet not impeding specialised and advanced work already underway by the existing modelling teams.</p> <p>PLATINUM is intended as a closely coupled, system of models, exchanging information among them, comprising:</p> <ul style="list-style-type: none"> <li>• a five-step, tour-based multi-modal strategic transport model, supported by a land-use model;</li> <li>• a hybrid meso-micro assignment, road transport model of the metropolitan road network;</li> <li>• an external travel model, interacting with the WA Statewide Transport Model; and</li> <li>• a freight transport model.</li> </ul> <p>Note: 1 indicates – Road passenger/vehicle O-D matrices; 2 – Travel times, delays, and queuing details; 3 – Time-dependent O-D matrices; 4 &amp; 5 - Heavy (Truck) and LGV O-D matrices</p> <p>Implementation requires: a) specification or re-specification of several current model components and alignment of data (consolidate the current 1,500 zones STEM and ROM24 networks, document, unpack/revise MLUFS); b) enhancements to the current models (higher granularity in capturing travel behaviour through additional household types, travel purposes, by time of day, using tours instead of trips, and updating parameters of the mode choice model (including travel time variability, crowding and perhaps estimating new models of destination choice); and c) creation of new component models (including departure time, using a hybrid meso-micro dynamic traffic assignment model of all road-based travel by time of day, considering quasi-dynamic traffic assignment as a better starting point for mesosimulation, a new model assessing wider benefits of projects, feedback to land-use, and authentic integration of all components).</p>
Further Research Opportunities	<p>Demonstrate improved behavioural capacity of modelling</p> <ul style="list-style-type: none"> <li>• Test quasi-dynamic modelling (purchased AIMSUN)</li> <li>• LU model alternative testing (CubeLands, UrbanSim)</li> <li>• LU-T Feedbacks</li> </ul> <p>Update, adapt for local context and test modelling assumptions</p> <ul style="list-style-type: none"> <li>• Identified and prioritized, as potential research opportunities for PATREC e.g. travel time thresholds (linked to value of time), trip generation rates etc</li> <li>• Value of time: investigation into the relative value of time per mode - important in understanding potential impacts and implications of travel demand measures such as</li> </ul>

	<p>congestion (cordon) charges and road user charges</p> <p>Radical scenario testing using current modelling (STEM) after G Currie – eg what if 50% reduction in private car use in morning peak?</p>
Outcome	<p>“The Transport Portfolio and Department of Planning commissioned PATREC to undertake an independent review of transport modelling in Perth along with a high level look at the land use inputs. The study explored a variety of options based on best practice across Australia and in other parts of the world and provided a number of recommendations for the way forward in Perth. Since completion of the review in mid-2014 the recommendations have been broadly endorsed by the Directors General of Transport and Planning and implementation has commenced. Funding for the modelling inputs has been secured and the Department of Planning modelling staff will transfer to the Department of Transport as of 1 July 2015. An Implementation Steering Group and Working Group are in place and will guide the implementation over the coming years in the move towards one strategic model with advanced capability to model future scenarios” (Craig Wooldridge, Network Planning (Moving People) Director, Integrated Transport Planning, Department of Transport, email communication, 4 June 2015).</p> <p>Further, PATREC was appointed to develop an experimental design for a related Stated Preference Survey.</p>

<b>Project name</b>	<b>Congestion Abatement through Travel Demand Management – Review of Measures (Report A) and Tools (Report B)</b>
Program Area	Integrated land use-transport planning and policy
Steering Committee	Brett Hughes (DOT), Craig Wooldridge (DOT), Tom McHugh (MRWA), Steve Priddy (Treasury)
Research Team	Courtney Babb (Curtin), Brett Smith (UWA) and Monir Moniruzzaman
Independent Reviewer	Prof Graham Currie, Chair, Public Transport, Director of Research (Transport Engineering) Monash University, Melbourne
Duration	March 2014 - December 2014
Purpose	<p>Report A aims to develop a working definition of TDM, capturing various perceptions on what travel demand management is thought to be and compile a matrix of measures being implemented, including the circumstances and contexts of implementation and evaluation in various jurisdictions</p> <p>Report B aims to identify approaches to assess TDM policies targeted at congestion mitigation including measures of congestion.</p>
Findings	<p><b>Report A: Instruments</b></p> <p>From a comprehensive review of over one hundred international and national transport research papers, conference proceedings and policy reports a range of instruments aimed at reducing the demand for single occupancy vehicle trips or redistributing these trips in space or in time, were identified and classified into nine categories: Improving Alternative Modes; Workplace; Integrating Transport and Land use Planning; Travel Behaviour Change Programs; Information and Communication Services; Management of Road Space; Governance and Administration; Parking; and Taxes and Charges.</p> <p>Choice of instrument for implementation should be cognisant of:</p> <ul style="list-style-type: none"> <li>• the specific behavioural response being targeted</li> <li>• the relevant transport</li> <li>• whether the instrument provides an incentive (pull) to change mode from SOV, or a disincentive (push) and how best to combine measures. Best outcomes are achieved when push factors such as charging are accompanying by pull factors. When implementing push instruments, there must be alternative travel options in place e.g. accessible public transport should be in place if road pricing instruments are implemented e.g. London and Stockholm congestion cordons were implemented with improvements to public transport and park and ride facilities.</li> </ul>

<b>Travel Demand Management Matrix - Summary</b>																					
Pull  Behaviour Modification Programs  Push	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">TDM Categories</th> <th style="width: 50%;">Sub-categories</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Improvements to alternative modes</td> <td>Walk Cycle Public transport</td> </tr> <tr> <td style="text-align: center;">Integrated land use and transport</td> <td>Regional Local</td> </tr> <tr> <td style="text-align: center;">Workplace based TDM</td> <td>Employer support Financial incentives and subsidies Alternative work arrangements Teleworking</td> </tr> <tr> <td style="text-align: center;">Travel behaviour change</td> <td></td> </tr> <tr> <td style="text-align: center;">Information management</td> <td></td> </tr> <tr> <td style="text-align: center;">Management of road space</td> <td></td> </tr> <tr> <td style="text-align: center;">Governance</td> <td></td> </tr> <tr> <td style="text-align: center;">Parking</td> <td>Parking supply Parking demand management</td> </tr> <tr> <td style="text-align: center;">Economic measures</td> <td>Financial incentives Taxes Road use charging</td> </tr> </tbody> </table>	TDM Categories	Sub-categories	Improvements to alternative modes	Walk Cycle Public transport	Integrated land use and transport	Regional Local	Workplace based TDM	Employer support Financial incentives and subsidies Alternative work arrangements Teleworking	Travel behaviour change		Information management		Management of road space		Governance		Parking	Parking supply Parking demand management	Economic measures	Financial incentives Taxes Road use charging
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	<p><b>Report B: Tools</b></p> <p>To support policy-makers in making decisions about the most effective instruments to use in their particular contexts, a range of related appraisal tools, evaluation procedures, performance and congestion measures have been developed and applied that may be used as the basis for selecting, implementing and reviewing TDM initiatives, including: Subjective Assessment and Participatory Models; Sketch Models; Network Models; and Strategic Policy Assessment Tools such as marginal abatement cost curves.</p> <p>Whilst cost-benefit analysis is a preferred appraisal methodology in transport appraisal in general, it has not been widely adopted in tools designed specifically for TDM appraisal, although its potential for this has been recognised. The most promising of the project level appraisal tools reviewed is TRIMMS because it extends the basic estimation of behavioural response to include a calculation of the private benefits as well as externalities. Also, TRIMMS has a cost-benefit analysis module.</p> <p>Community participation and subjective assessment tools may be useful in identifying decision-makers' policy priorities but are not necessarily appropriate to appraise individual TDM initiatives.</p> <p>Tools can be used in combination to improve efficiency. Subjective assessment tools such as short-listing and rapid appraisal offer a method whereby short-listing limits the number of initiatives to be appraised and a sketch model such as TRIMMS can be used for the rapid appraisal.</p> <p>Regarding strategic TDM policy and portfolio appraisal, the learning is threefold:</p> <ul style="list-style-type: none"> <li>• cost abatement curves applied in other field such as in climate science can be brought to bear in developing an appropriate strategic TDM policy assessment tool for Perth;</li> <li>• continuous project monitoring and evaluation will yield a database of evidence in terms of TDM elasticities; and</li> <li>• project appraisal tools or components of tools together with impacts and effectiveness measures and project- level valuations, provide inspiration for upscaling to the strategic policy level.</li> </ul>																				
Outcomes	Results of the TDM research has been incorporated into a DOT background paper on TDM as input to the Integrated Transport Network Plan process and is being built upon by a follow-on consultancy project to prioritise appropriate instruments for Perth through an engagement process.																				
Further Research Opportunities	Developing a prototype appraisal tool and guidelines for modelling the effectiveness of selected TDM instruments on the Perth network, including: <ul style="list-style-type: none"> <li>• establishing a base-case and targets for congestion levels which will involve a decision on an appropriate indicator of congestion;</li> <li>• sourcing and importing elasticities and valuation parameters drawing from well-documented valuations of transport policy benefits in Australian and international standards; and</li> <li>• providing an appraisal of the selected range of TDM instruments with recommendations for implementation priorities.</li> </ul>																				

## 2.3 Summary of Commencing and Continuing Projects

<b>Project name</b>	<b>Urban - Freight vehicle usage of Perth metropolitan area roads Regional - Grain freight activity on southern Wheatbelt roads</b>
Program Area	Freight Studies
Steering Committee	Anne-Marie Brits (DOT); Brett Hughes (DOT), Wes Soet (MRWA)
Research Team	Tim Hoffman (Consultant); Courtney Babb (Curtin), Monir Moniruzzaman (UWA) with in-kind support from DOT (Gavin Chan)
Independent Reviewer	-
Duration	Commenced April 2014 - ongoing
Purpose	To providing a qualitative understanding of freight vehicle usage per industry sector supply chain, starting with the retail industry to provide a platform for 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 the 2014/15 export grain season (essentially November-August)
<b>Project name</b>	<b>Review of infrastructure planning and financing options for WA</b>
Program Area	Infrastructure funding and implementation
Steering Committee	-
Research Team	Paul McLeod (UWA adjunct)
Independent Reviewer	Prof Sergio Jara-Diaz, University of Chile
Duration	Commenced March 2014, ongoing
Purpose	To identify research priorities for PATREC through a review process as the basis for developing specific project proposals in 2015
Findings	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 Privatization and Regulatory Asset Bases (RABS) and Value Capture. It was established that the Department of Transport is particularly interested in road pricing as an instrument to achieve efficiency and the Department of Treasury on value capture and its applicability to Perth. Project Plans for these two priority topics will follow in 2015.
<b>Project name</b>	<b>Evaluation of the use of mobile fitness application data to model bicycle usage patterns in an urban environment</b>
Program Area	Land use-Transport Modelling , Information and Economics
Steering Committee	-
Research Team	Dr Dave Blake (ECU)
Purpose	The main aim of this research is to determine the effectiveness of using individual cycling information collected using mobile phone applications, to model bicycle usage in the Perth metropolitan area.
<b>Project name</b>	<b>Stated Preference Survey – Experimental Design</b>
Program Area	Land use-Transport Modelling , Information and Economics
Steering Committee	A. Kleidon, R. Han
Research Team	D. Olaru, B. Smith and Huang Ying
Independent Reviewer	-
Duration	Commenced October 2014
Purpose	To design a suite of Stated Preference (SP) surveys and to examine the advantages and feasibility of combining these SP survey with the upcoming Perth and Regions Travel survey (PARTS, scheduled for 2016).
<b>Project name</b>	<b>Activity Centres Accessibility (RAC)</b>
Program Area	Land use-Transport Modelling , Information and Economics
Steering Committee	Sarah Cutter (RAC), Anne Still (RAC)
Research Team	M. Moniruzzaman, D. Olaru and S. Biermann
Independent Reviewer	Ian Espada (ARRB)
Duration	Commenced October 2014
Purpose	The goal of the study is 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, consolidation and connected city.
<b>Project name</b>	<b>AURIN WA Data Hub</b>
Program Area	Land use-Transport Modelling , Information and Economics
Steering Committee	AURIN, Landgate, DoP

Research Team	V. Paul, P. Hooper, D Purnovo (DoP), B. Boruff, S. Biermann
Independent Reviewer	-
Duration	Contract executed April 2014 – 18 months
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 West Australian spatial datasets along with many other datasets within the AURIN environment. It will also demonstrate and evaluate the effectiveness and efficiency of a machine-to-machine approach to access spatial, demographic and planning data in Australia, showing what is possible in moving beyond manual download and manipulation.
<b>Project name</b>	<b>Activity Centres: Making Land Use and Transport Work</b>
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. Olaru, A. Duckworth-Smith (AUDRC), R. Falconer (ARUP), R. Isted (Jacobs), S. Biermann
Independent Reviewer	Prof David Gordon, Queens University, Canada
Duration	Commenced September 2014
Purpose	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 is to: <ul style="list-style-type: none"> <li>• 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;</li> <li>• assess the applicability of comparable national and international best practice in resolving the conflict between Node and Place; and</li> <li>• provide a range of options for enhanced performance of existing and future settings.</li> </ul>

### 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. Also delivering training, education and professional development to advance the knowledge base and forge new and innovative evidence-based solutions for effectively planning and managing our high and rapid growth future.

#### 3.1 Seminars and Workshops

PATREC (co-)hosted 11 seminars/workshops in 2014, attracting over 350 delegates.

**Table 2: Overview of (co)organised Seminars and Workshops**

<i>Speaker</i>	<i>Event</i>	<i>Date</i>	<i># Attendees</i>
<b>E/Prof Michael Taylor</b> , School of Natural and Built Environments, University of South Australia	Integrated Energy, Transport, Water and Waste Demand Forecasting and Scenario Planning for Precincts	05-02-2014	40
<b>Prof Michiel Bliemer</b> , Institute of Transport and Logistics Studies (ITLS), The University of Sydney	Requirements for Traffic Assignment Models for Strategic Transport Planning: A Critical Assessment	07-04-2014	35
<b>Mr James McIntosh</b> (PhD-candidate), Curtin University Sustainability Policy (CUSP) Institute	Framework to capture the value created by urban transit in car dependent cities	12-03-2014	35
<b>Mr Phil Delaney</b> , Australian Urban Research Infrastructure Network at Melbourne University	Accessing Spatial Data through Online Portals (AURIN and SLIP)	30-04-2014	25
<b>Prof Michiel Bliemer</b> , Institute of Transport and Logistics Studies (ITLS), The University of Sydney	Road Pricing Reform	19-05-2014	35
<b>Ass Prof Valerià Paül</b> , PATREC	Perth public transport patronage: Mid-term trends and current situation	23-07-2014	40
<b>Post-Doctoral Research Fellow Monir Moniruzzaman</b> , UWA School of Business	Mobility in aging: Travel behaviour and implications for physical activity	07-08-2014	30
<b>Prof Graham Currie</b> , Chair, Public Transport, Director of Research (Transport Engineering) Monash University	Summary of Recent Innovations and Discoveries	08-09-2014	65
<b>Prof Graham Currie</b> , Chair, Public Transport, Director of Research (Transport Engineering) Monash University	Transforming Transport in London for the 2012 Olympic Games	01-10-2014	20
<b>Mr Courtney Babb</b> , Department of Planning and Geography, Curtin University	Audit culture and planning for walking: the institutional contexts of built environment auditing	05-11-2014	25
<b>Ass Prof Valerià Paül</b> , PATREC	Examining the contemporary shifting of Regional policies in Western Australia		
<b>Mr Xavier Albacete</b> , PhD candidate at University of Eastern Finland	The usage of potential physical mobility in transport planning. How do citizens use their transport mode options?		
<b>Prof Sergio Jara-Diaz</b> , University of Chile	Optimal pricing for travelcards under income and car ownership inequities	02-12-2014	15

### 3.2 Industry Engagements and Conferences

The Director was invited to address transport and planning research related issues on several occasions in 2014 and accepted invitations to speak at a number of events:

- **AITPM seminar** on 'Affordable Housing and Transport' on 10 April 2014. The title of the Director's presentation was: "Costs and affordability of low income housing in the Johannesburg/Pretoria region (Gauteng Province), South Africa".
- **AITPM panel debate** (8 May 2014) on 'A peak hour congestion charge should be levied in Perth'.
- **Radio interview** (Radio 720 ABC Perth, 8 July 2014), the Director and UWA Pro Vice – Chancellor Research Peter Davies were interviewed by Mr John McGlue, as a result of PATREC's Perspective on Perth public transport patronage.
- **Engineers Australia WA Division Transport** on the 20 November 2014. The title of the Directors' presentation was 'The role of PATREC in supporting Western Australia's transport and land use futures'.
- **Regional Research Symposium** hosted by the Department of Regional Development on the 11 September 2014. The title of the Director's presentation was "PATREC Overview".
- **AURIN Launch panel interview** on 13 October 2014, Melbourne.

The Research Development Officer accepted invitations to speak in relation to the following:

- Delivered a **keynote speech at the International Geographical Union conference** in Bucharest, Romania (24 Aug – 3 Sep) following the acceptance of his paper for a short presentation. His talk was titled "Examining the contemporary shifting of Regions in Western Australia"
- Responded to several **requests for radio and local newspapers interviews** which were made after the publication of PATREC Perspective – Perth Public Transport Patronage: "Off The Rails" or "Back On Track"?
- **Curtin Graduate School of Business**, May 2014: "Alternative Food Networks & Peri-Urban Farmlands"
- **Seminar of the Centre for Water Research (CWR)** at UWA, July 2014: "Perth Public Transport Patronage: Mid-Term Trends and Current Situation"
- **Symposium at the South Australian Research and Development Institute (SARDI)**, September 2014: "Considering the landscape heritage of vineyards: three experiences revisited"
- **Seminar of the Australasian Early Career Urban Research Network (AECURN)**, October 2014: "Perspectives on the heritagisation of the Swan Valley, Western Australia".

Members of the PATREC core team attended and presented papers at the following conferences in 2014:

- **2014 IAG/NZGS conference** (30 June – 2 July) in Melbourne: Valerià Paül presented "Perspectives on the Heritagisation of the Swan Valley, Western Australia"
- **Association of European Schools of Planning (AESOP) conference** (9-12 July) in The Netherlands: Courtney Babb presented a paper "The Policy Context of Built Environment Auditing" as part of his PATREC core team role.
- **International Geographical Union conference** (24 Aug – 3 Sep) in Romania: Valerià Paül delivered a keynote speech "Examining the contemporary shifting of Regions in Western Australia" at this conference.

- **International Conference on Transport Survey Methods** (16-21 November) in Australia: Doina Olaru presented her talk, co-authored by Brett Smith “Combining samples to offset nonresponse and respondent biases” at this conference on behalf of PATREC.

### **3.3 Building Capacity in WA**

#### **Teaching**

The Director and PATREC Associate, Courtney Babb contributed to Edith Cowan University’s transport planning teaching unit on 23 October 2014. The focus of the unit was on sustainable transport planning and implications for human and city well-being through exploration of social (behavioural), economic (technology pricing and management systems) and environmental (cities as sustainable ecosystems) factors. The Chair, Fred Affleck, also contributed to the same unit, on freight, leading a site visit to the Fremantle Port Authority.

The Research Development Officer was engaged in teaching at the School of Earth and Environment during a semester. The unit “Geographical and Planning Methods” was set up to provide 3<sup>rd</sup> year students with the skills (qualitative and quantitative methods) necessary for conducting sound research in the fields of geography and planning. Around 55 students attended these classes.

As part of the teaching activities two fieldtrips were co-organised and led by the Research Development Officer to Geraldton and Mid-West WA (September, 3<sup>rd</sup> year Geography – 30 students) and to Narrogin and the Wheatbelt (June, 2<sup>nd</sup> year master of Planning – 10 students).

#### **Supervision**

Two students at UWA successfully completed their honours degree research projects under the supervision of the Director in 2014. The research topics were: measuring the yield of infill housing on vacant lots in Perth’s central metropolitan region under different planning scenarios and comparing this to the targets and objectives of Directions 2031; and the utility and application of Google Maps traffic information to measure traffic congestion.

The research outcome from the Google Maps traffic tracking project aligned well with the PATREC research framework. Accordingly, the new graduate, Ms Isabel Huston, has been employed by PATREC on a part time basis, to produce a PATREC Perspective and paper based on the thesis and to assist in further data analysis and GIS related projects at the Centre.

#### **PhD Top-up Scholarships**

Ms Izumi Hart (Murdoch, supervisor – Laurence Hartley) completed her PhD study with the support of a PATREC Top-up Scholarship in May 2014. Her thesis is titled “Preliminary investigation into the measurement of safety culture in the Australian rail industry”.

A PhD top-up scholarship was awarded to Mr Jillella Satya Sai Kumar (CUSP, Curtin, supervisors – Peter Newman and Annie Matan) on 6 February 2014 for the duration of three years. Mr Kumar is undertaking his research at Curtin University on Innovative Financing for Urban Rail in Indian Cities: Land based Strategic Value Capture Mechanisms. The core research question being proposed is how to develop a viable and relevant value capture framework through integration of land use, transit and financing using value capture funding options for cities of developed and developing countries. The return on investment for supporting this research will be the

applicability of the findings to Perth (as a fast growing city) and the acknowledgement of PATREC in two peer reviewed publications.

Mr James McIntosh (CUSP, Curtin, supervisor – Peter Newman) was awarded a partial PhD Scholarship top-up on 19 March 2014 as support in completing in PhD study. The topic of his research is “A Comprehensive assessment framework for valuing transport infrastructure projects”. For the provided support PATREC is acknowledged in five of Mr McIntosh’s publications.

Daniel McDonald (ECU, supervisor – Geoff Syme) was awarded a two-year scholarship on 5 May 2014 to complete a PhD relating to accessibility and the spatial distribution of resilience to high oil prices in urban households.

### 3.4 Research Outputs

In the academic environment, it is difficult to draw an exact line in the sand between PATREC and non-PATREC generated outputs. Researchers work fluidly across years, projects and jobs, with academic articles often published more than a year after the actual research is conducted. The Research project reports, journal papers and conference papers have been the main output of PATREC research projects or have been supported by PATREC in a direct way and acknowledged in the publication accordingly. Outputs of “part-time” core team members connected, but not directly related to PATREC projects (usually relating to pre-existing projects), have not been claimed as PATREC outputs on the basis that this work has been conducted as part of the non-PATREC funded FTE component of their work and would have happened in any case, despite the existence of PATREC. All outputs of “full-time” core team members (Director and Research Development Officer) produced in 2014, even if unrelated to current PATREC research priorities, having been generated from research conducted as part of previous employment positions, are claimed as PATREC outputs as these are formally recognised as accruing (fully, or shared, depending on the designated affiliations) to the current employer, in this case, UWA. With these positions fully funded by PATREC, these outputs can be fully attributable to PATREC, beneficial to the host university partner.

On finalisation and with the permission of the client, final research project reports are published on the PATREC web site and links to published journal and conference papers provided. 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. Two Perspectives were published on the PATREC web site in 2014.

**Table 3: Research Outputs**

<i>Publication Title</i>	<i>Author/s</i>	<i>Publication Date</i>
<b>RESEARCH PROJECT REPORTS COMPLETED</b>		
Transport Modelling Review: Independent Review	John Taplin, Michael Taylor, Doina Olaru and Sharon Biermann	05-06-14
Congestion abatement through travel demand management (TDM), Phase 1: Review of instruments and tools, <b>REPORT A</b> – The Travel Demand Management Matrix: An International Review of TDM Instruments	Courtney Babb and Brett Smith	29-11-14

Congestion abatement through travel demand management (TDM), Phase 1: Review of instruments and tools, <b>REPORT B – Review of TDM appraisal and evaluation tools</b>	Brett Smith and Monir Moniruzzaman	29-11-14
<b>JOURNAL PAPERS PUBLISHED</b>		
Achieving residential connectivity and density goals with computer-generated plans in a greenfield area, <i>Environment and Planning B: Planning and Design</i> <b>41</b> (3) 430–449.	Sun, Y*, Min, Q, and Taplin, J *PhD-related, conducted as part of a previous PATREC-supported ARC Linkage program	31-01-14
Can value capture work in a car dependent city? Willingness to pay for transit access in Perth, Western Australia, <i>Transportation Research Part A: Policy and Practice</i> , Volume 67, September 2014, Pages 320–339, doi:10.1016/j.tra.2014.07.008	McIntosh, J, Trubka, R and Newman, P	27-08-14
The Role of Urban Form and Transit in the Rise of Car Dependence: Analysis of 26 Global Cities from 1960 –2000, <i>Transportation Research Part D: Transport and Environment</i> , Volume 33, December 2014, Pages 95–110, doi:10.1016/j.trd.2014.08.013	McIntosh, J, Trubka, R, Kenworthy, J and Newman, P	20-10-14
Tax Increment Financing Framework for Integrated Transit and Urban Renewal Projects in Car-Dependent Cities, <i>Urban Policy and Research</i> , Volume 33, Issue 1, 2015, DOI:10.1080/08111146.2014.968246	McIntosh, J, Trubka, R and Newman, P	03-12-14
<b>PATREC PERSPECTIVES</b>		
Perth Public Transport Patronage: “Off The Rails” or “Back On Track”?	Valerià Paül and Sharon Biermann	June 2014
GOING PLATINUM! A new approach to transport modelling in Perth	Sharon Biermann, John Taplin, Michael Taylor and Doina Olaru	Oct 2014
<b>CONFERENCE PAPERS PRESENTED</b>		
Combining samples to offset nonresponse and respondent biases presented at the International Conference on Transport Survey Methods (16-21 November) in Australia	Doina Olaru, Fakhra Jabeen and Brett Smith	Nov 2014
The Policy Context of Built Environment Auditing presented at the Association of European Schools of Planning (AESOP) conference (9-12 July 2014) in The Netherlands	Courtney Babb	July 2014
Examining the contemporary shifting of Regions in Western Australia, keynote speech presented at the International Geographical Union conference (24 Aug – 3 Sept 2014) in Romania	Valerià Paül	Sept 2014
Alternative Model of Tourism Development in Marginal Border Areas: Giving Voice to Locals in the Western Galician-Portuguese Raia Seca, Proceeding of the 21 <sup>st</sup> Colloquium of the CSRS of the IGU, Nagoya, Japan	Valerià Paül	Jan 2014
The use of geographic data (‘evidence’) in strategic plan preparation... and strategic plans in decision-making: a comparative study – Perth and Pretoria presented at the Association of European Schools of Planning (AESOP) conference (9-12 July 2014) in The Netherlands	Mark Oranje and Sharon Biemann	July 2014

**Table 4: Journal papers and book chapters submitted in 2014 for publication**

Title of Paper	Authors
Discussing the Couto Mixto (Galicia, Spain): Transcending the Territorial Trap through Borderscapes and Border Poetics Analyses”, <i>Geopolitics</i>	Valerià Paül and Juan-Manuel Trillo-Santamaría
Participatory Sustainability Approach to Value Capture-Based Urban Rail Financing in India through Deliberated Stakeholder Engagement	Satya Sai Kumar Jillella, Annie Matan and Peter Newman
The Ambiguous Geographies of Protected Areas in Galicia,	Valerià Paül and M. Pazos

Ambiente y Desarrollo. International Journal of Development and Environment	
Action Research for Tourism Planning in Rural Areas? Examining an Experience from the Couto Mixto (Galicia, Spain), Geographical Research	Valerià Paül, Juan-Manuel Trillo-Santamaría and P. Pérez-Costas
La recomposition des échelles territoriales en Galice (Espagne) : enjeu économique ou alibi idéologique ?, Espaces et sociétés	J.L. Vila-Vázquez, Juan-Manuel Trillo-Santamaría and Valerià Paül

## 4 PEOPLE AND RESOURCES

### 4.1 Staffing

During 2014 the PATREC office was formed by the Director, two full-time academics and two part-time casual administrative staff members (Personal Assistant and data analyst).

**Table 5: Research staff**

<b>PATREC Office</b>		
Sharon Biermann	0.6 FTE	Director
Andrew Lo	0.7 FTE	Centre Administrator
Valeria Paul	0.4 FTE	Research Development Office (commenced Feb 2014)
<b>Core Research Team</b>		
Sharon Biermann (UWA)	0.4 FTE	Program Leader: Integrated LU-T policy and planning
Valeria Paul (UWA)	0.6 FTE	Program Leader: Regional Planning and Transport (commenced Feb 2014)
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
Monir Moniruzzaman	1.0 FTE	Research Associate – Modelling, information and economics (funded through in-kind contribution of Doina Olaru and Brett Smith – commenced June 2014)
<b>Extended Core Research Team</b>		
Paul McLeod (UWA Adjunct)	Sub-contracted	Program Leader: Infrastructure Funding
Tim Hoffman (Consultant)	Sub-contracted	Program Leader: Freight Studies
<b>Project-based Research Associates – WA</b>		
Anthony Duckworth-Smith (AUDRC, UWA)	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
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
John Taplin (UWA)	Sub-contracted	Independent Transport modelling review
David Blake (ECU)	Seed funded	Mobile Fitness Apps and Cycling patterns
<b>External reviewers/project team – national/international</b>		
Michael Taylor (University)	Sub-	Team member: Independent Transport modelling

of South Australia)	contracted	review
Michiel Bliemer (ITLS, Sydney)	Sub-contracted	External Reviewer: Independent Transport modelling review
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

## 4.2 Finances

The PATREC Collaborative Research Agreement committed the collaborating partners to a total contribution of \$420,000 per year (core funding). It was agreed that the government partners (WA Planning Commission, Department of Transport and Main Roads WA) would have a six month payment “break” (for the period 1 July 2014 – 31 December 2014) while the universities “catch up” – due to difference in fiscal year vs calendar year- after which payment of contributions by all parties would resume as of 1 January 2015. The agreement was amended at the end of 2014 by deed of variation allowing the parties involved to make provision for the same schedule of cash contributions for 2015 and 2016. The WA Planning Commission reverted to its full contribution during the fiscal year 2013/2014 resulting in a \$50K surplus on the budget for 2014. Additional non-core funds were secured to the amount of \$240,660 (AURIN, MRWA – Transport Modelling Review, Freight and Logistics Council). Research expenditure remained well below budget amount as a result of an under-capacitated core research team.

**Table 6: Financial summary for 2014**

	<i>YTD Actual 31/12/2014</i>	<i>Budget 2014</i>	<i>Variance Budget vs Actual</i>
<b>INCOME</b>			
<b>Core Funding</b>			
Collaborating Partners	230,000	0	50,000
<b>External Funding &amp; other</b>			
Other Research Grants & Contracts/Tenders	240,660	400,000	-159,340
<i>Accrued Interest</i>	62,321	65,000	-2,679
<b>Total Income</b>	<b>532,981</b>	<b>645,000</b>	<b>-112,019</b>
<b>EXPENDITURE</b>			
<b>PATREC OFFICE (excl. research of Dir. &amp; RDO)</b>	312,508	315,931	3,423
<b>RESEARCH (incl. research of Dir. &amp; RDO)</b>	488,226	913,576	425,350
<b>Total Expenditure</b>	<b>800,734</b>	<b>1,229,507</b>	<b>428,773</b>
<b>BALANCE (Income less expenditure)</b>	<b>-267,753</b>	<b>-584,507</b>	
Balance Carried Forward from 2013	1,568,104	1,568,104	
<b>CLOSING CASH BALANCE</b>	<b>1,300,351</b>	<b>983,597</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. The Head of School of Earth and Environment, UWA attends as the host of PATREC. There has been one succession in 2014 with Mike Burbridge replacing Charlie Thorn as the Curtin University representative.

**Table 7: Advisory Board member PATREC**

2013	2014
Adjunct Prof Fred Affleck, Independent Chair	Adjunct Prof Fred Affleck, Independent Chair
Mr Charlie Thorn, Director Research and Development, Curtin University	<b>Mr Mike Burbridge, Executive Director of Australian Sustainable Development Institute, Curtin University</b>
Prof Geoff Syme, Professor of Planning, Edith Cowan University	Prof Geoff Syme, Professor of Planning, Edith Cowan University
Mr Tim Shanahan PSM, Director, Energy and Minerals Institute, The University of Western Australia	Mr Tim Shanahan PSM, Director, Energy and Minerals Institute, The University of Western Australia
Ms Sue McCarrey, Deputy Director General, Department of Transport	Ms Sue McCarrey, Deputy Director General, Department of Transport
Mr Stephen Troughton, Managing Director, Main Roads Western Australia	Mr Stephen Troughton, Managing Director, Main Roads Western Australia
Mr Eric Lumsden, Chair, Western Australian Planning Commission	Mr Eric Lumsden, Chair, Western Australian Planning Commission
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

## 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. These are captured in output targets related to four areas of performance, based on the partner universities' policies on requirements for research centres adapted to included knowledge transfer indicators of policy impact, including:

- performance impacts for enhanced research capacity;
- profile impacts for improved competitive advantage;
- productive partnerships for institutional vitality; and
- policy-relevant evidence for knowledge transfer.

**Table 8: Summary statistics of performance in relation to set targets**

<i>Key Performance Indicators</i>	<i>Targets 2014</i>	<i>Achieved 2014</i>	<i>Qualification</i>
<b>Performance impacts for enhanced research capacity</b>			
Number of research grant proposal <i>submitted</i> (external and core funded)	5	6	Accessibility, AC node/place, stated preference, TDM, freight studies, infrastructure funding (see Table 1)
Number of research grants <i>secured</i>	4	7	External/core - Accessibility, AC node/place, TDM, freight studies, AURIN WA Hub Core funds only - stated preference, infrastructure funding (Table 1)
Number of seed research projects supported		1	Mobile fitness apps and cycling usage patterns (ECU)
Number of journal articles, conference papers for inclusion in proceedings and book chapters <i>submitted</i> for publication but not published in 2014	8	4	Table 4
Number of journal articles, conference papers in proceedings and book chapters <i>published</i> in 2014	5	4	4 journal articles (Table 3)
Number of PhD graduates produced through top-up scholarships	1	1	Izumi Hart (Murdoch)
Number of PhD top-up scholarships awarded	3	3	James McIntosh (Curtin), Sai Kumar (Curtin), Daniel McDonald (ECU)
<b>Profile impacts for improved competitive advantage</b>			
Number of research staff attracted and retained	10	16	6 core team research staff 2 core team consultants 8 project sub-contractors (see Table 5)
Value of additional research funding secured	\$500K	\$240K	AURIN (160K), MRWA – transport modelling review (70K), Freight Logistics Council (10K)
<b>Productive partnerships for institutional vitality</b>			
Attendance number at workshops and connection events	200	350 plus	See Table 2
Number of external collaboration agreements initiated	4	4	In the form of external reviewers and project team members as an initial step (see Table 5)
Number of joint projects approved		3	AC node/place, TDM, freight studies, AURIN WA Hub
No. of joint authored journal articles submitted		0	
<b>Policy-relevant evidence for knowledge transfer</b>			

Number of project plans with policy links proposed		6	All proposed projects were policy-linked
Number of RAC/SCs established and functional		7	Most projects have a functional SC
Number of peer reviewed Research Report published	4	3	Research project reports (Table 3)
Number of factsheets published	5	2	PATREC Perspectives (Table 3)
Number of conference papers presented	8	5	Table 3
Number of connection events	6	11	Table 2
Number of short courses planned/given in projects	0	1	ECU unit contribution by 3 team members



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