



**PATREC**

Planning and Transport Research Centre (PATREC)

# **BUSINESS PLAN**

**2016**

<b>Advisory Board Chair</b>	<b>Adjunct Professor Fred Affleck</b>
<b>Director</b>	<b>Professor Sharon Biermann</b>
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# **1 INTRODUCTION**

## **1.1 Background**

The last Business Plan presented to and approved by the PATREC Advisory Board was that of 2014. 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. The minutes of the meeting (#40) held on 11 June 2015 state:

*“Due to the PATREC Review currently underway, the outcome of which might affect the current business model, in particular currently reported KPIs, the Business Plan 2015 will not be finalised until after the Review has been completed.”*

Following the Review, a series of iterative engagements with partners in relation to the findings and recommendations took place and it was not until its meeting on 21 April 2016, that the Advisory Board agreed to the terms of a new PATREC agreement. A Budget for 2015 was approved by the Advisory Board on 12 March 2015 (Meeting #39), excluding Key Performance Indicator (KPI) targets for 2015. A revised Budget for 2015 was approved (ITEM 6.3; Meeting #40 on 11 June 2015) to accommodate previously unbudgeted expenditure related to the Review.

A draft Budget for 2016 was noted by the Advisory Board on 21 April 2016 (ITEM 8, Meeting #43). This Business Plan for 2016 incorporates that draft Budget and includes a strategic update and KPIs.

Because this Business Plan has been compiled well into 2016, as a result of the Review and its follow-up, in some respects what is reported here is a work-in-progress rather than a forward-looking plan. According to the new Collaborative Agreement, future Business Plans will be presented to the Advisory Board at the last meeting of each calendar year to direct business for the following year.

## **1.2 Purpose of this Plan**

The purpose of this Business Plan is to set out the research plan, budget and KPIs for 2016 in line with the broad strategic direction of PATREC as established for the four-year period in the Strategic Business Plan 2013-2016. The Business Plan 2016 includes a strategic update, in response to some of the key recommendations in the PATREC Review and subsequent stakeholder engagement, as an interim measure to embrace some proposed new approaches until a new Collaborative Agreement has been completed and agreed to.

A new Strategic Plan 2017-2019 together with a Business Plan for 2017 will be presented to the Advisory Board at its December 2016 meeting, in line with the terms of the new PATREC Collaborative Agreement which will likely be in place at that stage. It is intended that the new Strategic Plan will be for a three year period and will more completely respond to the outcomes of the PATREC Review.

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## 2 STRATEGIC UPDATE

Although the four-year strategic direction presented in the PATREC Strategic Business Plan 2013-2016 remains largely valid and continues to be used as the strategic framework for this more detailed Business Plan for 2016, the PATREC Review has necessitated an update of the Strategic Plan to guide the operations of PATREC and the focus of our research program during 2016 and into 2017. In addition, the release of the draft Perth and Peel@3.5million land use plan (WAPC, 2015) and the Perth Transport Plan (Department of Transport (DOT), Public Transport Authority (PTA) and Main Roads Western Australian (MRWA) 2016) and the bid for a new smart transport Cooperative Research Centre (CRC), iMOVE, will further influence the research activities for 2016.

### 2.1 PATREC Review

At the Advisory Board Meeting held on 12 March 2015 (#39), it was agreed that a review of arrangements for the continuing and sustainable operation of PATREC would be undertaken to facilitate continuous attraction and retention of high quality research staff, and to provide for more efficient forms of cross-institutional collaboration. Consultants were accordingly appointed 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 key findings:

- There remains a strong need for planning and transport research in WA.
- There is a strong role for PATREC in meeting those needs.
- PATREC has set itself ambitious targets for its limited resources and relatively limited time of 'renewed' operation.
- PATREC has demonstrated strengths and achieved successes.
- PATREC is facing some challenges, many 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;
  - Building public profile through media and engagement with industry partners;
  - Role and responsibilities of the advisory board; and
  - KPIs are too ambitious for the small scale of operation and not sufficiently outcome-oriented, addressing both academic and policy-relevant objectives.

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;
- 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.

These are the key aspects that have directed the formulation and implementation of this Business Plan and are expanded on in subsequent sections.

## **2.2 Terms of the New Collaborative Agreement**

These terms of agreement are based on the PATREC Review Report, ITEM 5 on the Review presented to the Advisory Board on 3 December 2015 and subsequent feedback from and discussions with partners:

- The operating model to remain as a ‘collaborative research centre’, not transitioning to a single university centre.
- A rolling three-year financial regime, ie. an agreement by all parties that they will make financial contributions, according to an agreed scale, in each of three years, with the triennial end-date rolling forward annually by one year, subject to agreement by the Advisory Board (on behalf of their respective institutions).
- An exit clause to be included for participants to leave the collaboration after a notice period of one year.
- The Advisory Board to focus on high level, strategic matters, ensuring that expectations of all collaborating partners are being met and that the frequency of Advisory Board meetings is to be reduced from four to three times a year.
- PATREC to focus on conducting collaborative, applied research and teaching in support of policy in the connected spaces of transport and land use planning.
- A PATREC Research Advisory Committee (PRAC) to be established to (1) enhance collaboration amongst partners at the research project level; and (2) introduce an element of formality and rigour to the research project identification, selection, support, monitoring and dissemination. Comprising at least one senior representative from each partner organisation, chaired by one of the government partners and meeting three times per annum in advance of Advisory Board meetings, so as to be in a position to advise the Advisory Board on more detailed research project matters, allowing the Advisory Board to concentrate on strategic matters.

It was agreed that these intentions would be incorporated into a new Collaborative Agreement drafted by the host organisation and circulated to Advisory Board members for consideration and comment to enable finalisation and signature by collaborating partners before the end of 2016.

## **2.3 Establishment of a PATREC Research Advisory Committee (PRAC)**

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 following additional details:

- The primary role of PRAC is to support the Director with research project planning, monitoring and execution, and recommend selected research projects to the Advisory Board.

- The existence of PRAC shall be included in the new Collaborative Agreement (Projects section to be updated to include existence and role of PRAC).
- The Chair of PRAC is to be an Advisory Board member or nominated representative of one of the government partners, elected by the Advisory Board and appointed for 12 months. Chairmanship could be on an annual rotation basis.
- The Advisory Board endorses Mr Brett Hughes, as the representative of Graeme Doyle, Department of Transport, as Chair of PRAC for 2016.
- PRAC will consider and finalise the PRAC Terms of Reference to be brought to the Advisory Board for endorsement.
- Accumulated funds will be used for 2016/17 core research projects.

## 2.4 Attracting Skilled Academic Staff

Further to the benefits of a three year rolling agreement in terms of bringing more certainty into mid to longer term research activities with an enhanced ability to attract senior and experienced research academics, the approach for 2016 is to appoint PATREC coordinators to support university partner Advisory Board members and the Director to enable stronger levels of engagement and linkages with academic institutions ensuring clear working relationships and expectations and harnessing necessary skills and capacity to undertake PATREC research.

## 2.5 iMOVE CRC

A Bid process has commenced for the iMOVE CRC (Intelligent MObility & Vehicle Evolution) with the following proposed priority areas/themes:

*Table 1: iMOVE CRC Bid themes and anticipated outcomes*

Theme	Outcomes
<p>Theme 1: Intelligent Transport Systems &amp; Infrastructure</p> <p>Congestion is rapidly rising and building new infrastructure is placing an unsustainable drain on funding</p>	<ul style="list-style-type: none"> <li>• Increase network capacity</li> <li>• Reduce the cost of congestion</li> <li>• Unlock the value of existing and future datasets</li> </ul>
<p>Theme 2: New End-to-End Freight Solutions</p> <p>To address inefficiencies in the fresh produce and multimodal freight system that impact on their profitability</p>	<ul style="list-style-type: none"> <li>• Deliver fresh produce to new and more distant markets</li> <li>• Increase value of perishable goods (less waste more shelf-life)</li> <li>• Improve just-in-time delivery of all goods</li> </ul>
<p>Theme 3: Enhanced personal mobility</p> <p>Australian cities are struggling to cope with the volume of traffic. However, the need for personal mobility is expanding.</p>	<ul style="list-style-type: none"> <li>• Reduce congestion with more effective mass transport options</li> <li>• Enhance the traveller experience using multimodal options</li> <li>• Increase mobility for older and disabled Australians</li> </ul>

The Stage 1 Bid submission was due on 31 March 2016. The Stage Two submission will be due "August/September", and interviews held October, and announcements "by the end of the year".

This Bid offers significant opportunities for PATREC leverage with the following benefits:

- Scope of CRC is sufficiently broad to ensure WA's specific priorities can be included;
- Good alignment between WA transport research needs (and what PATREC is prioritising in any case) and themes outlined in the Bid Prospectus and Stage 1 submission – at least at a high level, with opportunity in Stage 2 to incorporate WA specific needs. Integrated land use and transport planning, scenario planning, modelling, big data, performance management, travel demand management, are all included currently;
- Strong alignment between objectives of CRC and PATREC - focus on applied research and outcomes to meet industry needs;
- Mobilise WA transport research within a broader national agenda;
- Give PATREC some necessary critical mass and scale – broadens transport research involvement – attracting other skills (maths, computer science, engineering) to be applied in solving transport problems;
- What we would have done anyway to respond to WA research needs but at more significant scale;
- Access to research networks, skills and industry across the country; and
- Associated education and training program.

## **2.6 Release of New Land Use and Transport Plans**

### **2.6.1 Draft Perth and Peel@3.5million**

The draft *Perth and Peel@3.5million* suite of strategic land use planning documents aiming to accommodate 3.5 million people by 2050 was released in May 2015 with the vision of:

*"a great, connected city that is globally competitive and technologically advanced; that is sustainable, resilient and respects its natural assets and heritage; that maximises the use of new and existing infrastructure; and that offers a mix of housing and lifestyle choices" (WAPC, 2015 p8).*

Some of the key challenges in managing the envisaged continuing high levels of population growth identified in the plan, offer significant scope for planning and transport research to inform policy development:

- Achieving residential infill target of 47 per cent by 2050;
- Ensuring as many new homes and jobs as possible are within existing activity centres, linked with efficient public transport routes;
- Reducing car dependency; and
- Maintaining liveability through managing the trade-offs between residential and employment location and infrastructure and service costs (WAPC, 2015 p16).

A connected city was identified as the preferred future growth pattern because it provides the best balance between urban infill and fringe development. There are planning and transport research opportunities in supporting agencies in their efforts in achieving a connected city in having:

- a strong central business district;
- a network of connected activity centres with high-quality public transport and road linkages;
- high-quality global and local infrastructure networks including roads, public transport and globally competitive, highly accessible airport and sea port infrastructure;
- urban form that maximises the use of existing infrastructure assets in parallel with extending infrastructure into the development areas of the outer sub-regions identified in the relevant draft sub-regional planning frameworks (WAPC, 2015 p21).

### **2.6.2 *Transport@3.5million - Perth Transport Plan for 3.5 Million People and Beyond***

To meet the transport planning challenges of changing land use patterns and employment distribution, low density development, congestion, improving network efficiency, adapting to technological advancements, and addressing physical inactivity and air quality, the objectives of the *Transport Plan*, released by the Government on 29 July 2016 are to:

- Optimise use of the existing network as it grows;
- Integrate with land use across the public transport, active transport and road networks;
- Deliver high frequency, ‘turn up and go’ mass rapid transit connected with effective public transport feeder services (the focus of the PATREC research report referred to above);
- Provide a safe, connected active transport network of primarily off-road cycleways and walkways; and
- Maintain a free-flowing freeway and arterial road network for the efficient distribution of people and freight (DOT, PTA & MRWA, 2016 p2).

The Plan offers an opportunity for planning and transport research in support of transport policy-makers in achieving an integrated network for 3.5 million people and beyond in the tasks of:

- Connecting major activity centres and encouraging transit orientated development that is well-serviced by all modes of transport for example trains, light rail, buses, on-demand transport services, cycling, walking and cars;
- Prioritising active and public transport to meet the significant increase in travel demand that population growth will generate;
- Complete the strategic road network and identify ways to use the network more efficiently; and
- Serve increasing freight demand with efficient links to ports, airports and intermodal hubs (DOT, PTA & MRWA 2016 p4).

### 3 PATREC CORE RESEARCH FOCUS 2016-17

#### 3.1 Project Selection Process, Approach and Principles

Table 2: Project selection process

Tasks	Oversight and Decisions	Date
Research needs/potential project possibilities finalisation	Stakeholder workshop to discuss and refine the research needs/potential project possibilities list	6 April 2016
Researchers prepare short proposals in response to needs	The provisional PRAC meets to consider short project proposals (1 pagers) submitted by researchers in response to the project list.	20 April 2016
Project prioritisation	PRAC meets to prioritise project according to principles and make recommendation to Advisory Board	4 May 2016
Recommendations on project priorities to Advisory Board	Advisory Board approval through Out-of-session paper	16 May 2016
Researchers prepare detailed Project Plans and assemble project teams	Project Plans discussed with project Steering Committees	June/July 2016
Researchers revise Plans to accommodate Steering Committee inputs and submit to PRAC	Agreed Project Plans presented to PRAC for recommendation to Board on basis of policy relevant research questions, scope and value for money	2 August 2016
Recommended Project Plans and budgets to Advisory Board for approval	Advisory Board approval of Project Plans and budgets	18 August 2016
Conduct research		August 2016- July 2017

The **approach** used to guide project formulation included:

- Time frame of 12 months for project duration, starting mid-2016 and completed by mid-2017.
- Only accumulated PATREC funds used for the 2016/17 round of PATREC projects as a once-off.
- Accumulated funds are indicated at around \$500,000 so the budgeting guide was \$100,000 per project for five projects.

General **prioritisation principles** used by the PRAC to recommend projects for approval:

- Avoid research areas currently highly politicised and where imminent change in the policy environment is expected (eg. value capture).
- Tools, data, models and new methodologies should not be the focus of a project but rather the means to answering certain policy-focussed research questions.
- Should have a tangible bearing on specific policy, particular the suite of plans relating to the implementation of Perth and Peel@3.5million.
- Research which informs the Infrastructure Coordinating Committee (ICC) priorities is considered important.
- Research to inform planning and transport “aspirational” targets, eg. mode share targets, included in current strategic plans, was considered very important.

- Research which informs demand-side management and policy, ie. making the best use of current infrastructure deferring the need for more infrastructure, as opposed to supply-side solutions, was preferred.
- Research focussing on improving land use-transport interaction as part of the implementation of Perth and Peel@3.5million, without changing the overall chosen land use “scenario”, was highly prioritised.
- Research on long term city futures, depending on “more talkshops” about possibilities which are “anybody’s guess” was not prioritised but possible alternative futures and their implications for travel demand and behaviour was considered more important.
- Research should build on what has already been done within the agencies and the detailed project plans should account for existing work and data, facilitated through project steering committees.

## 3.2 Research Projects

### 3.2.1 Project Possibilities

A list of project possibilities in response to research needs organised into the themes: land use and transport futures, travel behaviour change and harnessing big and smart data, emanated from a workshop with key state government partners on 6 April 2016 (Table 3) and was provided to researchers to respond to with short, one-pager, potential project concepts.

*Table 3: Project possibilities identified in relation to research themes*

Project Areas	Project Possibilities
<b>(1) Land Use and Transport Futures</b>	(1.1) Activity Centre futures – the role of infrastructure as an enabler in achieving urban employment outcomes
	(1.2) Longer term mass transit planning implications for land use planning (feedback from transport to land use)
	(1.3) Infrastructure funding futures – embedding funding mechanisms into the planning and management cities
	(1.4) Scenario Planning for Social and Technological Change
	(1.5) Simulating the implications of autonomous vehicles, AVs (and other technologies eg. suspended technologies), on transport and mobility
	(1.6) Demonstrate improved behavioural capacity of land use and transport modelling in modelling system impacts of behaviour changing measures
<b>(2) Travel Behaviour Change in Response to New Technologies</b>	(2.1) Stated Preference on AV-based Shared Mobility
	(2.2) Potential attitudes to and acceptance of new technologies/ autonomous vehicles in WA
	(2.3) Transport Technology Trial - evaluation
	(2.4) Time Use Data with other devices to determine benefit of active transport with a view to influencing change to more active travel
	(2.5) Travel demand management (TDM) – valuation tool
<b>(3) Harnessing Big (and small), Smart Data for Performance Monitoring and to Inform Investment Decisions</b>	(3.1) Disaggregated, more granular spatial analysis of employment and non-residential activities across the metropolitan region
	(3.2) Accessibility benchmarking
	(3.3) Mining, analysis and visualisation of SmartRider/Bus GPS data to better understand travel patterns
	(3.4) Enhanced Road Network Performance Monitoring and visualisation
	(3.5) Understanding urban freight generation and movement patterns

### 3.2.2 Potential PATREC Research Project Concepts as Proposed by Researchers

Table 4: Potential research project concepts submitted by researchers in response to circulated list of potential project possibilities/research needs

Potential Project Concept Titles	Number
<b>(1) Land Use and Transport Futures</b>	
Addressing future uncertainties of Perth at 3.5 million: What-if scenarios for mass transit	1.1.1
Hedonic pricing – firm location and land value	1.1.2.1
Integrating value capture	1.1.2.2
Synergistic impact of TOD on housing prices	1.1.2.3
Scenario planning for technical and social	1.2.1
Simulation tools for AV	1.2.2.1
Cooperative transportation by AV	1.2.2.2
Sharing economy and impacts on transport	1.2.3
Digital scenario tools for big city planning	1.2.4
<b>(2) Travel Behaviour Change in Response to New Technologies</b>	
Method for gaining a deeper insight into travel behaviour – existing modes, shared mobility and AV	2.1
AV – understanding how to support behaviour change (Focus groups)	2.2
Independent mobility amongst the 55+ age group – travel mode intentions and decisions	2.3
Behavioural change in travel decision – reducing congestion (university students)	2.4
New data collection methods for (active) travel behaviour: portable cameras and activity monitors	2.5
A strategic merit and rapid appraisal model for assessing transport demand management projects	2.6
<b>(3) Harnessing Big (and small), Smart Data for Performance Monitoring and to Inform Investment Decisions</b>	
Evidence based spatial decision system for transport accessibility and usage	3.1
Enhanced road network performance monitoring and visualisation	3.2
Scoping multi-criteria data for evaluating passenger travel in Perth	3.3
Mining, analysis and visualisation of SmartRider data	3.4
Benchmarking accessibility	3.5
Perth road freight analysis	3.6
Big data, technology and transportation – congestion management and emergency response	3.7
<b>(4) Other</b>	
Exploring crime, fear of crime and quality of life at transit-related environmental settings	4.1
Optimisation of bus stop locations	4.2
Near-road environmental sensitivity analysis for heavy vehicle freight transport	4.3
Design a driving simulation program to improve older driver’s situation awareness in distracted driving	4.4
Strategic implications of disruptive technologies on planning and transport agencies	4.5
A minimum passing distance road rule: an investigation of road user attitudes, behaviours and road network suitability	4.6

### 3.2.3 Approved Projects

Potential project concepts submitted by researchers were assessed and aggregated by the PRAC and five projects were recommended to the Advisory Board for approval. All five projects were approved by the Advisory Board through an out-of-session paper. Researchers were informed of the outcome and detailed Project Plan development commenced with wider research teams and project Steering Committees.

Additionally, to align with the iMOVE bid process and in anticipation of strengthening PATREC research endeavours into the areas of freight and network operations in the medium term, two small seed projects commenced to conceptualise a freight research program in relation to freight industry needs and also a network operations research program in collaboration with Main Roads Network Operations team.

*Table 5: Approved Projects*

<b>Project Number</b>	<b>Title(s)</b>	<b>Description</b>
Project 1	Addressing Future Uncertainties of Perth at 3.5 million: What-if Scenarios for Mass Transit	Understanding land use intensification in relation to the viability of alternative forms of public transport.  (Corridor case study application exploring LU-T feedbacks, tipping points and thresholds)  Policy relevance: Implementation of P&P@3.5 million; ICC
Project 2	Understanding Travel Behaviour Change <ul style="list-style-type: none"> <li>o Social-psychological insights for tailoring interventions for different demographic segments to reach mode share targets</li> <li>o Scenario planning for technical and social change – disruptive technologies and social change impacts on future travel behaviour and demand</li> </ul>	Trips of the future - from the basis of current trips (informed by Project 4), what is the likely travel behaviour for a city of 3.5 million.  Policy relevance: What groups do we have to target in what ways to reach % aspirational mode share targets in the transport plan for P&P@3.5?
Project 3	A Strategic Merit and Rapid Appraisal Model for Assessing Transport Demand Management Projects	Will assist in the appraisal of TDM policies and projects. Will identify low cost and low risk TDM projects that may be ready for trialling as well as higher cost projects that may warrant further examination through the use of detailed transport modelling.
Project 4	Understanding Travel Behaviour Patterns and Trends	Informs Project 2 – disaggregated view of current trends in travel behaviour.  Performance monitoring – could feed into the Directions/P&P@3.5 Annual Report Card
Project 5	Understanding Freight Demand Generation Patterns Per Industry Type	Existing and future freight (link to Project 2) generation patterns will inform modelling assumptions, commercial vehicle survey design and commercial land use planning (eg. subdivision)

### 3.2.4 Detailed Project Plans with Budgets

Detailed project plans with budget estimates, with a timeframe of 12 months, prepared by researchers with Steering Committee engagement, were presented to the PRAC who recommended approval to the Advisory Board. As far as possible, within priority, availability, capacity and skills constraints, distribution of accumulated PATREC funds across the five approved projects are allocated to the three university partners in accordance with their proportional funding contributions.

Because research project commencement is essentially around 1 August 2016, with completion planned for mid-2017, only half of the estimated total project budget of \$580,000 is included in the 2016 budget presented in Section 5.

Table 6: Projects and Budgets, 2016-17

Project Number	Title	Project Lead	Champion/ Agencies	Budget Estimate and Allocation (\$000)				
				TOTAL	UWA	Curtin	ECU	Other
Project 1	Addressing Future Uncertainties of Perth at 3.5 million: What-if Scenarios for Mass Transit	Doina Olaru (UWA)	Craig Shepherd DoP, PTA, DOT, Treas.	125	50	60	0	15
Project 2	Understanding Travel Behaviour Change	Cath Ferguson (ECU)	Simon Grieve DoP, MR, DOT	100	20	0	70	10
Project 3	A Strategic Merit and Rapid Appraisal Model for Assessing Transport Demand Management Projects	Brett Smith (UWA)	Sue Hellyer DoP, PTA, DOT, MR, Treasury	55	55	0	0	0
Project 4	Understanding Travel Behaviour Patterns and Trends	Mike Ridout (Curtin)	DoP, PTA, DOT, MR, Treasury	195	75	120	0	0
Project 5	Understanding Road Freight Demand Generation Patterns Per Industry Type	Tim Hoffman (Consultant)	Craig Shepherd DoP, DOT, MR	105	10	30	0	65
<b>TOTAL</b>				<b>580</b>	<b>210</b>	<b>210</b>	<b>70</b>	<b>90</b>
Seed Project 1	Freight Research Program*	Paul McLeod	Brett Hughes					30
Seed Project 2	Network Operations Research Program*	Chao Sun	Kamal Weeratunga		30			

\* Preparation for 2017/18 projects; aligned with iMOVE

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## **4 EXTERNAL RESEARCH PROJECTS 2016-17**

While the primary focus in 2016 and into 2017 is on undertaking five priority projects funded using accumulated PATREC funds, two other projects initiated in 2015, both with some external funding, are to be conducted in 2016/17.

### **4.1 Mass Transit Research Project**

PATREC was commissioned by the Department of Transport in 2015 to prepare a plan for 'mass rapid transit' for the Perth and Peel Region @3.5million and beyond. The basis for this major PATREC research and planning project was the draft Perth and Peel @3.5million suite of strategic land use planning documents referred to earlier. This research was largely undertaken in 2015 but the finalisation of the main report together with a number of technical working papers was done in the first quarter of 2016. PATREC's report was included in a high-profile public release on 29 July 2016 of a large suite of government documents, intended for public consultation.

### **4.2 ARC LIEF Urban Analytics Data Infrastructure (UADI) Project**

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.

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.

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## 5 BUDGET 2016

In response to the PATREC Review, the budget for 2016 is presented in a slightly altered format to make more explicit the distinction between “administrative” and “research” costs. The balance between administration and research costs, now more accurately reflects the actual situation and is more in line with standard practice (ie. 20% administrative “overheads”). Research coordination across the three participating universities is included as ‘research’ costs.

No change in subscriptions is assumed and the intention is that no additional project funding from core partners will be sought for 2016 so that accumulated funds will be expended. Other than secured external income (ARC-LIEF, the last payment from the Mass Transit @ 3.5 m project and possibly some draw-down of funds from the RAC grant), no further external income has been budgeted so that all available resources are expended using accumulated funds. This is not sustainable over the longer term and will not be repeated in the following year. A requirement for expending of accumulated funds will be that project outcomes will include evidence of leveraging, eg. ARC Linkage grant proposal submission.

Research coordination expenditure includes 0.6 FTE (Director) for the full year and 0.4 FTE Curtin coordination and 0.2 ECU for 6 months (July-Dec 2016). Project research costs reflect half of the estimated project costs, ie. July-December 2016 of the total planned project costs for project duration of a year, with completion in July 2017. Costs relating to two small seed projects, an RAC project, the LIEF project and finalisation of the Mass Transit are also included as project costs.

With total income estimated at \$648,000 and total expenditure at \$1,186,320, accounting for the balance brought forward from 2015 at \$1,026,585, the closing balance as at 31 December 2016 is budgeted to be \$488,265.

Table 7: Budget 2016

<b>PATREC Budget 2016</b>	<b>\$</b>	<b>Notes</b>
<b>INCOME</b>		
WA Government Grants	240,000	
Partner Universities Sponsorship	180,000	
Other Research Grants & Contracts	200,000	Other than ARC LIEF income (90K) & last MTP payment (110K), no further external funds sought for this year as a once-off occurrence
Accrued Interest	28,000	Estimate: depending on interest rate in 2016
<b>Total Income</b>	<b>648,000</b>	
<b>EXPENDITURE</b>		
<b>PATREC OFFICE</b>	<b>199,420</b>	
Director (0.4)	86,600	
Administrative Officer	72,000	
Staff Training	2,500	Course fees
General Office Costs	15,000	Computer software & hardware, printing, stationery, telephone, meetings
Advisory Board Chair Stipend	23,320	This has remained fixed since 2003.
<b>RESEARCH</b>	<b>986,900</b>	
Research Coordination	176,541	Director (0.6) = 130K; Curtin (0.4 for 6 mths) = 36K; ECU (0.2 for 6 mths) = 11K
Project Researchers & Consultants	585,359	290K – 5 research project (half of estimated budget as projects extend to mid-2017) 60K seed projects 75K LIEF (70% of LIEF) 50K RAC 110K Mass Transit finalisation
PhD Scholarship Top-up	40,000	Curtin: 20K, UWA: 20K
ARC LIEF Project Contribution	40,000	
Research Communication	45,000	Events: Seminars/Connection events (5K), visiting fellows (5K), Conference attendance x4 (20K); Publishing book (15K)
Infrastructure Charges	100,000	Mass Transit Plan invoices (90%)
<b>Total Expenditure</b>	<b>1,186,320</b>	
<b>Balance brought forward from 2015</b>	<b>1,026,585</b>	
<b>CLOSING BALANCE (incl Balance B/F)</b>	<b>488,265</b>	Includes: RAC Grant unreleased funds (\$96,996); Outstanding DoP (AURIN) Invoice (\$80,000)

## 6 KEY PERFORMANCE INDICATOR TARGETS 2016

In accordance with the PATREC Review, performance indicators have been considerably reduced to essential academic and policy impact indicators with focus on outputs and outcomes rather than inputs.

Table 8: Key Performance Indicator Targets 2016

Performance Indicator	Target 2016
<b>Academic Performance Indicators</b>	
Number of journal papers published	3
Number of peer-reviewed book chapters published	10
Number of peer-reviewed conference papers published in proceedings	7
Number of peer-reviewed books published	1
Number of top-up sponsored PhD graduated	1
Value (\$) of external research funding secured	\$200K
<b>Policy Impact Performance Indicators</b>	
Number of high impact, policy-informing projects completed	1
Number of substantive Technical Reports/Working Papers published	5
Number of PATREC Perspectives published on PATREC website	1
Number of presentations at PATREC and other connection events	5
Number of connection events arranged and held	2
Number of short courses, unit contributions presented	2