Planning and Transport Research Centre (PATREC)

STRATEGIC BUSINESS PLAN

2013-2016

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EXECUTIVE SUMMARY

It is against the background of a new dispensation for PATREC, evolving from a successful base established during the first decade of operation, that this Strategic Business Plan has been formulated. The new dispensation entailed:

- A new agreement - in April 2012, a PATREC Collaborative Research Agreement was signed for a further term of five years, by the same founding university partners with the exception of Murdoch, with the Government of Western Australia also being signatories, constituted "for the purposes of conducting collaborative research and teaching in the areas of transport policy and planning and urban and regional planning";
- A new five-year funding commitment by the partners as part of the Agreement;
- The appointment of a new Director in October 2012; and
- A new home at the University of Western Australia, School of Earth and Environment.

The purpose of this Plan is to set out the broad strategic direction of PATREC for the four year period 2013-2016 and to provide a more detailed action focus for the inner year, 2013. The Plan will be reviewed annually on a four-year, rolling basis. The reason for choosing this four year timeframe is that the current contractual agreement commenced on 12 April 2012 and ends on 11 April 2017 and so the period 2013-2016 comprises the four full calendar years covered in the agreement.

Informed by the contextual drivers and contributions from the first stakeholder workshop held on14 December 2012, the value-adding role of PATREC in contributing to the achievement of these stakeholder goals over and above what can be done within the individual constituent institutions using a business as usual approaches can be stated as follows:

Capitalising on our extended network of academic expertise and policy partners, our value proposition is to broker integrated planning and transport research across the collaborating partner organisations through the following key strategic activities:

- multi-disciplinary, multi-institutional research in response to identified agency research requirements and knowledge gaps;
- knowledge transfer and transfer through academic and less formal publications, connection events and an information portal as a reliable and accessible resource for researchers and policy-makers;
- training, predominantly in the form of professional development through short courses, executive programmes and "expert" courses on key topics, conducted in collaboration with other professional and industry bodies where possible; and
- attracting additional research funds through business development

in order to advance the knowledge base and forge new and innovative evidence-based solutions for effectively planning and managing Western Australia's high and rapid growth future.

To address the challenge of achieving focus in setting the research agenda of PATREC, the approach followed relied on eliciting the views of key PATREC stakeholders of research issues, priorities and questions pertinent within the WA integrated planning and transport context. At a workshop held on 14 December 2012 with more than 30 academic, industry and government participants, the question of the research priorities which need to form the focus of PATREC research, was discussed and synthesised into four key research focus areas and some cross-cutting areas:

- Sustainable models of urban form to accommodate growth and frame infrastructure investment

- Demand management – intelligent transport, pricing mechansims and socio-behavioural factors
- Regional development – freight transport, coastal shipping economics, aviation and effectiveness of supertowns
- Freight in urban areas – activity and logisitics-based freight modelling, congestion impacts, freight-land use conflicts and design codes
- Cross cutters
    - Implementation barriers
    - Over-arching conceptual frameworks
    - Underpinning information and modelling platform
    - Climate change, energy

To enable the expedient organisation, management and delivery of a PATREC research program, and to ensure strong multi-disciplinary approach, the identified research focus areas have been broadly grouped within the ambit of two big research questions:

- Research Question 1: What are the multi-perspective impacts of and solution for decoupling economic growth and liveability in metropolitan Perth – accommodating economic growth whilst retaining and enhancing quality of life?
- Research Question 2: What are the dynamics and mechanisms involved in building the competitive and collaborative advantages of the regions of WA?

The sustainable urban form, demand management and urban freight research areas map broadly to Research Question 1 while the regional development and transport research area maps to Research Question 2. The cross-cutting aspects of governance and institutional issues, enabling information and modelling and climate change will be incorporated into both research programs. Key research questions identified during a second stakeholder workshop held on 22 February 2013 are included as sub-questions:

- Research Question 1:
    - What are the sustainable models of urban form to accommodate growth and frame infrastructure investment – local and metropolitan scales?
    - How well do these models perform against a set of multi-disciplinary evaluation indicators?
    - What is the best integrated modelling platform for evaluating impacts?
    - How can demand be better managed to reduce the need for more infrastructure – intelligent transport, pricing mechanisms and socio-behavioural factors?
    - How can increasing urban freight levels best be accommodated in a dense urban context – economics of congestion and land use conflicts?
    - What are the implemented barriers – governance, funding, institutional and cultural?

- Research Question 2:
    - What are the most efficient modes of freight transport to overcome the tyranny of distance?
    - What is the role of transport in the different regional contexts and growing and lagging regions?
    - What are the demographic changes happening to explain why some towns are declining and others growing?
    - What are the impacts of rate of change in indigenous areas on transport and how is community resilience impacted by a changing transport context?

- What governance arrangements could improve the Inconsistency and lack of uniformity in the networks and responses across the state?
- What is the effectiveness of SuperTowns and Royalties for Regions in achieving objectives?

As part of the continuing process of establishing the PATREC research direction, the research focus area ideas emanating from the first stakeholder workshop, together with further, more detailed research questions identified by stakeholders at the second stakeholder workshop, will inform the development of each of these questions into research program frameworks which will guide the formulation and development of research proposals. The research questions may be amended and revised on the basis of iterative interactions with potential funders and human resource capacity, capability and availability.

The latest PATREC Collaborative Research Agreement (2012) commits the collaborating partners to a total of $420,000.00 per year for 2012, 2013 and 2014 and makes provision for the same or an amended schedule of cash contributions for 2015 and 2016. This core sponsorship amount essentially covers the salaries and operating costs of the PATREC office and some connection event costs. It is the "balance carried forward" funds which have accumulated during the last two years when little expenditure on research occurred, that allows for some research leverage. In order for PATREC to remain financially sustainable over the longer term, and to provide sufficient impetus for making an impact, PATREC will need to charge a "brokering" fee, levied as a percentage of the total cost of a contract or grant obtained where PATREC has added value. The exact mechanism for implementing this charge needs to be determined through further negotiation with the partner universities and in line with their particular infrastructure charging policies. In addition to brokering fees, the opportunity to sign up additional sponsors and charging fees for short courses exists to increase income levels.

Core sponsorship funding from the collaborating partners, together with the unspent "balance brought forward", provides for the following human resources:

- PATREC office
  - Director (0.6 FTE) – 5 year appointment
  - Research Development Officer (0.4 FTE) – 3 year appointment (UWA)
  - Administrative Assistant (0.6 FTE) – 1 year casual appointment - to be converted to fixed term appointment (1.0 FTE) from 2014
  - Advisory Board Chair (stipend)

- PATREC core research team
  - Director (0.4 FTE) – 5 year appointment
  - Research Development Officer (0.6 FTE) – 3 year appointment (UWA)
  - Research Leaders (x2) (0.25 FTE) - 2 year, extendable appointment (x1 Curtin; x1 UWA/ECU)
  - PhD scholarships (x4) ($20,000/annum top-up scholarships) – 3 years
  - Postdocs (x2) (0.5 FTE) – 2 year, extendable appointment

  With some additional sponsorship and/or brokerage income, the core research team could be expanded to include:
  - Consultants – limited, as required

Broad key performance indicators 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 following list of performance indicators for PATREC has been compiled from the partner universities' policies on the establishment and review of research centres, supplemented with knowledge transfer indicators policy impact:

- Performance impacts for enhanced research capacity
- Profile impacts for improved competitive advantage
- Productive partnerships for institutional vitality
- Policy-relevant evidence for knowledge transfer

Indicators and targets set for 2013 are primarily "input" indicators for this re-establishment year.

Key outputs envisaged in 2013:

- Two research program frameworks for the two big research questions
- At least four detailed project plans prepared and submitted for funding applications with a "basic" plan for continuing work on the project with no additional funding and a "comprehensive plan" indicating the work to be undertaken if additional funding applications are successful
- Baseline analyses for the two program areas (first deliverable of approved projects)
    - Presented at two special topic seminars to showcase the multi-disciplinary research
    - Published in two Working Papers
    - Published in two Fact Sheets
- Two connection events - one with visiting speakers (local and possibly national) – one to do with planning and transport information – AURIN and BITRE, Land gate
- Research Advisory Committees established and operation for each of the program areas
- Revitalised website
- Two ARC Linkage Project proposals submitted
- Four journal articles submitted
- Four conference papers presented
- Audit of training courses and industry needs to identify gaps and collaboration opportunities

1 INTRODUCTION

1.1 BACKGROUND

The Planning and Transport Research Centre (PATREC) was constituted in May 2003 through a Memorandum of Understanding (MOU), with the participation and support of Western Australia's four public universities and the Government of Western Australia (WA). The partner government agencies were not party to the MOU but participated through representation on the Advisory Board. The stated mission was to "undertake world class research and teaching in transport and associated fields for the benefit of Western Australia." (MOU PATREC, 18 November 2002). PATREC was established as a centre for the benefit of the community, to facilitate, develop and promote knowledge, understanding and best practice in planning and transport through research and education and provide a focus for all those engaged in it, from a full range of relevant backgrounds and professional affiliations. It was envisaged that PATREC would provide professional leadership in transport in WA through:

- Research and development;
- Education and professional development; and
- Knowledge management and transfer.

In the ensuing years, PATREC proceeded to successfully play a role in the delivery of more than 75 research projects in the broad topic areas of:

- Transport safety and risk (30%);
- Rail freight and ports (15%);
- Transit Oriented Development (10%);
- Transport and residential choice modelling and data (10%);
- Urban planning (liveability, density, greening, place-making) (5%); and
- Other various (5%).

The role that PATREC played in the delivery of this research was in the form of:

- Postgraduate studies support;
- Fellowship and scholarship facilitation and support;
- Facilitate and participate in ARC Linkage Projects Grants;
- Seed funding; and
- New research entity establishment (C-MARC, WAPARC).

The focus of attention in terms of education and training was the development and implementation of a Masters of Transport Studies (MTS) degree. This degree course was ultimately abandoned in due to a high drop-out rate and dwindling registrations.

The knowledge management and transfer activity delivered:

- A series of Working Papers;
- PATREC Research Forums (7 were held);
- Topic-specific conferences (TOD, port-based logistic systems, third part access regimes for rail freight);
- International experts hosted to present specialist workshops; and
- Breakfast seminars.

A series of recommendations emerging from an independent review of PATREC in 2010 together with the transfer of the hosting of PATREC from Curtin University and the retirement of the Executive Director in 2011, resulted in a new PATREC dispensation with:

- A new agreement - In April 2012, a PATREC Collaborative Research Agreement was signed for a further term of five years, by the same founding university partners with the exception of Murdoch, with the Government of Western Australia also being signatories, constituted "for the purposes of conducting collaborative research and teaching in the areas of transport policy and planning and urban and regional planning";
- A new five-year funding commitment by the partners;
- The appointment of a new Director in October 2012; and
- A new home at the University of Western Australia, School of Earth and Environment.

It is against this background of a new dispensation of PATREC evolving from a successful base established during the first decade of operation that this Strategic Business Plan has been formulated.

1.2 PURPOSE AND STRUCTURE OF THE PLAN

The purpose of this Plan is to set out the broad strategic direction of PATREC for the four year period 2013-2016 and to provide a more detailed action focus for the inner year, 2013. The Plan will be reviewed annually on a four-year, rolling basis. The reason for choosing this four year timeframe is that the current contractual agreement commenced on 12 April 2012 and ends on 11 April 2017 and so the period 2013-2016 is the four full calendar years covered in the agreement.

The Plan is structured in three parts. Following the introductory section which provides the background to PATREC's current position and the purpose and process of developing the Plan, the second part presents the Strategic Direction with a four year focus which sets out what PATREC will be doing, the context within which it is operating, resourcing allocations for delivery and Key Performance Indicators for measuring the success of delivery. The third part comprises the Business Plan which provides a more detailed view of goals, actions, deliverables, resourcing and a budget for the inner year of 2013.

1.3 PLAN DEVELOPMENT PROCESS

This Plan has been compiled through a process of engagement with a range of PATREC stakeholders in the planning and transport arena, including leading academics, industry representatives and influential policy partners from state and local government. More than 60 one-on-one discussion and two stakeholder workshops were held during the period November 2012 to February 2013 with the purpose of exploring the most beneficial role and research focus for PATREC in advancing the integrated planning and transport knowledge base and provide enhanced evidence to inform policy decisions. The first workshop, held In addition to eliciting the views of key stakeholders, current planning and transport plans were consulted to provide an understanding of the situational policy environment.

An outline of the Plan was presented to the Advisory Board on 14 December 2012 and a Draft Plan presented for discussion and comment on 14 March 2013. The Final Plan will be presented to the Advisory Board for approval on or before 13 June 2013.

Context of rapid and high rate of population and economic growth in Western Australia, key policy documents and university requirements for research centres.

2 STRATEGIC DIRECTION

2.1 CONTEXTUAL DRIVERS

2.1.1 Rapid and high growth

The State Planning Strategy – Planning for Sustained Prosperity (Draft, 2012) highlights the following facts about the rapid and high rate of population and economic growth in Western Australia:

People

- The population of Western Australia could increase from 2.4 million currently to at least 3.5 million and possibly 5.4 million by 2056.
- Perth is projected to become home to 75% of the State's population by 2050, in an increasingly urbanised society
- Over 60% of households are now one or two people. However, in 2011 over 70% of housing stock was developed as a family home.
- In 1976, housing loan repayments consumed a quarter of average full-time income. Recent figures show that housing loan repayments consume about one third of the median household income.
- In 2011 the Regional Prices Index for WA indicated that the cost of housing in the Kimberley is 33.1% and in the Pilbara 99.8% higher than in Perth
- There are up to 150 Aboriginal settlements in the remote regions of Western Australia, requiring reliable essential and local government services and adequate social services.
- Western Australia is well placed, in terms of, to compete.
- This will influence the need for
- Regional expansion through programs such as the State Government's Pilbara Cities and SuperTowns initiatives will relieve population pressure on the Perth metropolitan region but will require well-planned, integrated and compact regional centres and towns generating local and regional economic activity, and will necessitate greater innovation and specialisation.

Economics

- The emergence of the State's North West and Mid West sectors as hotspots for capital investment and their increasing contribution to Australia's GDP
- Western Australia is Australia's premier growth state, with a quarterly state final demand value that has not decreased in trend terms for over 10 years, a record unmatched by any other state or territory
- Western Australia is part of a global economy. Its annual goods and services exports grew by 32.7% in 2010-11 and 16.2% per annum on average during the five years to 2010-11.
- Western Australia's economy will be underpinned by the energy and mining sectors but the State must also diversify its economy to facilitate a broader mix of industries and occupations that can make for a sustainable, resilient and ultimately successful society
- To continue to globally compete successfully for skills, Western Australia must build on its natural resources and quality of life assets and link economic development opportunities to a high quality of life.

Transport and infrastructure

- Over 12.6 million passengers travelled through Perth Airport in 2011-12, an increase of 8.7% on the previous year.
- Western Australia is the premier state for seaborne trade, handling more than 56% of the nation's export trade volume (in tonnes). The eight port authorities provided 80% by volume and 92% by value of the State's international seaborne trade in 2009-10.
- Freight transport is often associated with large trucks and semi-trailers, yet in reality close to 70% of freight is distributed throughout the city by light commercial vehicles.
- Western Australia's vast distances and sparse population present complex challenges for productivity and sustained prosperity.

Environment

- The ecological footprint of Western Australians is one of the highest in the world (measure of consumption per capita)
- Particularly in the South West of the State, climate-dependent surface and groundwater sources are becoming less reliable as a result of reduced average rainfall and increased temperatures
- Approximately 2000 GL of water is extracted and produced annually for all purpose in Western Australia. Demand is estimated to double by 2040.
- 63% of electricity generated in this State is derived from gas, 29% from burning coal, 3% from renewable technologies and 4% from oil.

The State of Australian Cities 2012 (Dept. Infrastructure and Transport) highlights the following facts about Perth:

Population

- Perth's population increased from 1,452,058 in 2001 to 1,832,114 in 2011
- A growth rate of 2.4%, well above the national average of 1.5%
- Australia's fourth fastest growing city (after Gold Coast, Cairns, Sunshine Coast)

Employment

- Since 2000 Perth's labour force participation rate has increased consistently reaching 69.4% in 2012, well above the national rate of 65.1%
- It is one of the only major cities to have an increase in its participation rates since 2008

Transport

- In Perth almost 80% of people travel to work by car and 12% by public transport
- Cycling is the main mode of travel to work for 1.2%, in line with the national average.
- Perth has the lowest proportion of people walking to work of the capital cities (2.6%)
- Only 41% of Perth residents agree that the city provides 'good transport infrastructure and services' and is a 'safe place for people and their property' (Australian City Liveability Index survey)
- SPP - There is an increasing trend in the use of cycle paths throughout metropolitan Perth, with an increase of 13% at fixed counters from early 2011 to 2012.
- SPP - The newer suburbs of Perth can be considered 'active open space poor' suburbs. This means residents will have to travel long distances to play organised sport.

Environment

- Perth has the highest proportion of residents who feel that their city has a 'quality natural environment' (79%).

2.1.2 Planning and Transport Plans and Policies

The following plans have provided the policy context:

- Directions 2031 and Beyond – A high level spatial framework and strategic plan for the future growth of the metropolitan Perth and Peel regions (WAPC, 2010).
- State Planning Strategy - The Vision. The Plan. The Future. Draft for public comment, 2012. The purpose and function of this document is to provide a basis for the integration and coordination of strategic planning across state, regional and local jurisdictions, coordinating and promoting land use planning, transport planning and land development in a sustainable manner, and for the guidance of public authorities and local governments on those matters
- Liveable Neighbourhoods policy that outlines objectives and criteria for the siting, design and assessment of structure plans and the built form (WAPC, 2009).
- Public Transport for Perth in 2031. Draft for Consultation, 2011.

2.1.3 University Research Centre Requirements

The stated purpose of establishing research centres by universities is to add value to the university's research profile and performance above that which is achievable through usual operating arrangements. Research centres are viewed as platforms, focused and coordinated around specific themes, which provide a supportive, facilitative and coordinating environment for:

- conducting and showcasing collaborative, cutting edge, multi-disciplinary research;
- producing high quality research outcomes and training;
- linking science and policy - in cases where industry is a partner, providing relevant, evidence-based policy-informing evidence, advice and services to stakeholders to beneficially influence strategic State initiatives;
- providing a framework for attracting and managing research funds and related contracts;
- enhancing "brand" recognition in a competitive research funding environment where success depends on success in reputation building, and
- creating critical mass in areas of research strength.

(Sources: UWA Policy on Establishment and Review of UWA Research Centres, 2012; Curtin University Establishment and Review of Externally Funded Research Centres Procedures, 2007; Curtin University Establishment and Review of University Research Institutes and Centres Procedures, 2010).

2.1.4 Independent review of PATREC 2010

In response to the recommendations provided in an independent review of PATREC in 2010, it was agreed by the PATREC Advisory Board that, while the broad mandate of PATREC would remain largely intact, in the new PATREC dispensation, there needs to be:

- more of an urban and regional planning profile, in addition to transportation, with the integration between the two being a priority;
- more focus in general with a five-year "Roadmap" developed to provide a clear and focused path forward;
- a more clearly defined value proposition;
- more effective partner engagement and collaboration;

- a more diverse range of training types considered, including short courses, undergraduate units, professional development courses, a different kind of Masters;
- more flexibility in the business model to be more responsive to industry needs and to ensure necessary accountability; and
- more co-investing partners.

2.2 VALUE PROPOSITION

Within the broad contractual mandate of PATREC being constituted "for the purposes of conducting collaborative research and teaching in the areas of transport policy and planning and urban and regional planning", the value proposition goes a step further by clarifying the value which is provided by PATREC to its constituent stakeholders which goes beyond the sum of the individual parts. PATREC has two types of stakeholders: universities and government. Ultimately, the outputs sought by universities are primarily more and better academic papers, more external research funding, more postgraduate degrees, more collaboration and profile and more social impact. Government wants access to more, better and relevant evidence to inform plans and policy decisions.

Informed by the contextual drivers and contributions from the first stakeholder workshop held on14 December 2012, the value-adding role of PATREC in contributing to the achievement of these stakeholder goals over and above what can be done within the individual constituent institutions using a business as usual approaches can be stated as follows:

Capitalising on our extended network of academic expertise and policy partners, our **value proposition** is to **broker** integrated planning and transport research across the collaborating partner organisations through the following key strategic activities:

- multi-disciplinary, multi-institutional research in response to identified agency research requirements and knowledge gaps;
- knowledge transfer and transfer through academic and less formal publications, connection events and an information portal as a reliable and accessible resource for researchers and policy-makers;
- training, predominantly in the form of professional development through short courses, executive programmes and "expert" courses on key topics, conducted in collaboration with other professional and industry bodies where possible; and
- attracting additional research funds through business development

in order to advance the knowledge base and forge new and innovative evidence-based solutions for effectively planning and managing Western Australia's high and rapid growth future.

The stakeholders at the first workshop also provided an indication of the importance of each of these activity areas with research and development considered the highest priority for PATREC, followed by knowledge management and transfer, with education and training the least important activity.

The value-add role of PATREC is further articulated in a set of strategic **objectives** relating to each of the **key strategic activities:**

Brokering multi-disciplinary, multi-institutional research in response to identified agency research requirements and knowledge gaps

- Identify, articulate, compile and communicate R&D needs of research users and knowledge gaps and opportunities as identified by research providers in the form of research focus areas and priorities.
- Initiate the translation of identified research needs and knowledge gaps into key research questions and project designs.
- Craft the research so as to achieving the R&D balance between more basic and applied research by pitching and designing the research in such a way as to deliver some shorter term, policy-responsive wins, but also enables publishable contribution to the knowledge base in the longer term.
- Coordinate, assemble and mobilise multi-disciplinary, multi-institutional research teams to propose and undertake research projects.
- Track and communicate current R&D activity to avoid duplication, identify knowledge gaps and collaborating opportunities.
- Contribute to the resourcing of R&D through:
    - Inspiring, attracting, acquiring and retaining human resource capacity by:
        - advertising and proactive search to discover potential human resource capacity
        - providing top-up scholarships for postgraduate studies, particularly PhDs
        - contributing to funding of postdoctoral fellowships
        - identifying and communicating available research capacity for optimal sharing of resources.
    - Undertaking core research including baseline studies as a platform on which to build more comprehensive research concepts to be undertaken by larger research teams funded by additional funding.
- Facilitate the establishment of new spin-off research entities if and when it is opportunistic and reasonable to do so.

Ensuring knowledge management and transfer through academic and less formal publications, connection events and an information portal as a reliable and accessible resource for researchers and policy-makers

- Require, produce and monitor the delivery of formal academic and less-formal publications as an essential research output in the form of:
    - Peer-reviewed technical working papers, overseen by an editorial board to ensure quality and published on-line
    - Factsheets on key findings for less academic audiences
    - Academic journal articles, books and book chapters.
- Require, produce and monitor the delivery of specific, practical policy products such as tools, methods and datasets, demonstrated and described.
- Initiate and conduct a range of targeted connection and communication events to inform and be informed of research and policy activities, products and findings in the form of:
    - An annual research forum
    - Topic-specific conferences, seminars, workshops and breakfast functions, inviting national and international visiting experts as speakers when appropriate.
- Investigate and use social media to inform of activities and outputs to a wider, less targeted audience, including Twitter, Blogs, Facebook as appropriate and effective.
- Develop the website into more of a “Knowledge Portal” to disseminate relevant information:
    - Central resource for researchers and policy-makers, agencies (e.g. research supervisors, speakers)
    - One-stop-shop of who’s doing what
    - Facilitating integration with wider community of interest such as urban design and health

    - Data library/management of transport data.
- Play an "advocacy" role only in as far as raising the PATREC profile and publicise research results is concerned.

Brokering the provision of training, predominantly in the form of professional development through short courses, executive programmes and "expert" courses on key topics, conducted in collaboration with other professional and industry bodies where possible

- Of highest priority, identify, initiate and co-ordinate short courses on topical issues, not too narrowly focussed on transport but also planning, infrastructure, freight, land use, which could be the precursor for formal units, with strong links with industry.
- Fund conversion of research outputs into short course material as a deliverable.
- Identify opportunities to contribute units to existing postgrad courses and undergrad to a lesser extent and coordinate, responsive to industry needs.

Attracting additional research funds through business development

- Replenish core funding through
    - "Brokering" fees on external research income earned
    - Short course fees
    - Affiliate sponsorship.
- Leverage external research funds by:
    - providing core funding to incubate new and innovative research ideas through to the development of project proposals including ARC grants
    - co-funding selected, high impact research projects.
- Identify opportunities, facilitating tendering for and conducting contract research.

2.3 RESEARCH FOCUS AREAS

Within the broad PATREC mandate, there are a wide range of possible planning and transport research opportunities afforded by WA's unique, high and rapid growth 'laboratory'. One of the recommendations of the 2012 independent review of PATREC was that there needs to be a far greater degree of strategic focus to guide research direction and choice rather than a more opportunistic approach which tends to result in a wide range of research areas investigated. On the other hand, the review also suggested expanding the research profile to more strongly address planning as well as transport.

To address the challenge of achieving focus in setting the research agenda of PATREC, the approach followed relied on eliciting the views of key PATREC stakeholders of research issues, priorities and questions pertinent within the WA integrated planning and transport context. At a workshop held on 14 December 2012 with more than 30 academic, industry and government participants, the question of the research priorities which need to form the focus of PATREC research, was discussed and synthesised into four key research focus areas and some cross-cutting areas:

- Sustainable models of urban form to accommodate growth and frame infrastructure investment
- Demand management – intelligent transport, pricing mechansims and socio-behavioural factors
- Regional development – freight transport, coastal shipping economics, aviation and effectiveness of supertowns

- Freight in urban areas – activity and logisitics-based freight modelling, congestion impacts, freight-land use conflicts and design codes
- Cross cutters
    - Implementation barriers
    - Over-arching conceptual frameworks
    - Underpinning information and modelling platform
    - Climate change, energy

The issues and ideas discussed at the workshop as part of these research focus areas are summarised as follows:

Sustainable models of urban form to accommodate growth and guide infrastructure investment

- Sustainable City Models for accommodating growth
- Understanding the broader impacts of urban growth (Perth context) - Planning - Transport Atlas
- Normative conceptual framework
    - Productivity potentially a good " hook" for federal government.
        - Incorporates aspects of congestion management and liveability
        - Applicability statewide – not only urban
        - Establishing a new urban planning paradigm
        - Changing cultural norms – traditional funding models, liveability, etc
    - What about global influences? What can we achieve in a global setting?
    - Challenging the fundamental assumptions currently in place for land use and transport e.g. often worst case approach adopted.
    - Social aspects, equity and personal safety (behavioural?)
    - Consider trade-offs between ecological and economic aspects and individual choice and preferences to achieve compact city and address climate change issues
- What are the objectives we are aiming for? What are the measures of a successful/ sustainable city?
    - Achieve urban growth that is efficient, is socially equitable, productive, durable, healthy, accessible and integrated
    - Dealing with conflicting goals of land use planners who want intense activity, mixed use along arterials and transport planners who want to move people and freight
- Successful models for adoption as a springboard for future application
    - Compact city models
        - Concentrate habitation
    - Polycentric city models
    - Activity Corridor models of urban intensification
        - Most connected places by public tansport
        - activating the activity centres – infill target and self-sufficiency rate evaluation
    - How does transport support these models?
        - Public transport
        - Human-scale approach to transport:
            - Movement of People not just vehicles – Moving People may be a landmark guide
            - Walking and walkability
            - Perception of walking in the city
            - Experience of place that is embedded within that
            - Stimulate vibrancy of city, walk further, use 3D visualisation
        - Active transport and accessibility – barriers and opportunities

        - Mode change is important as is desire lines and local connectivity constraints – in a hub and spoke based model
    - Car use and the impacts of changing urban form
- Multidisciplinary, spatial evaluation
    - How do the alternative models of urban form perform- implications of a compact, intensified, polycentric city and the form and function of transport – longitudinal evidence of effect of urban forms on mode choice and car use in particular
    - What is urban efficiency and urban growth efficiency in light of other KPI's eg health, equity and other impacts
    - Health impact need to be factored into PATREC's urban form research – health impacts (costs)
    - Trade-offs - densities, distance, mode, land value, preferences, affordability
    - Supported by integrated LU/T modelling – integrate existing models, fit-for purpose, new model/s?
    - Policy evaluation - Monitoring and evaluating targets and the effectiveness of policies and strategies
        - Ex-ante – need to set up targets and strategies right upfront – need to take a more rigorous approach to targets and goal setting – what is achievable and how do we best get there – in theory and in practice.
        - Ex-post – need capability to measure the effectiveness of policy, strategies and targets – how effective have we been?
        - Need good baseline data to monitor change and effect of policy

Demand management – intelligent transport, pricing mechanisms and socio-behavioural factors

- How effectively do we use existing infrastructure and resources?
    - Transport pricing
        - Need strategic approach
        - Demand management measures
        - Subsidies and tolls
        - Value capture
        - Externalities
- Maximising the available transport infrastructure not just predict and provide
- Use of smart systems
    - Intelligent Transport
- Financial models to enable and drive the desired behaviours and shifts in transport systems– congestion pricing, parking fees, toll roads, value capture and others.
- We don't fully understand the cost of congestion
    - Seeking market mechanisms to influence congestion and influence travel choices
    - Applicability of alternative funding mechansims for transport including road pricing schemes and subsidies
- Peak Demand Management
    - Peak demand management and funding to transition to new models.
    - Changing culture of traditional funding mechanisms that perpetuate car dependency
    - Pricing mechanisms are in place but difficult to progress and needs a better approach.
    - Innovative incentives (eg. not just increasing parking price in CBD) – look at Bogota and Curitiba examples
    - Negotiation of the funding solution with a key research role for PATREC in this area
- Travel mode choice (behavioural)
    - Lots of economic work but gaps in non economic area – habit, peer pressure, etc and linking to economic factors.

- Testing the effectiveness (including cost) of mode shift interventions. Look outside WA
- Consider community aspirations for healthy and active transport solution – research advocacy

Regional development and transport

- Tyranny of distance of regional freight
- Regional transport economics
  - Investigate coastal shipping economics
- Aviation
  - Impacts of regulatory policy - intra-state routes, amalgamations etc.
  - Effects of regulating Regional Passenger Transport and charters.
  - Impacts of regulation on regional economics.
  - Regulation of airport location and governance of local airports.
- Lack of inter state agency integration
  - Inconsistency and lack of uniformity in the networks and responses across the state creating uncertainty or confusion
- Regional centres
  - Effectiveness of SuperTowns and Royalties for Regions in achieving their objectives. Have we made good choices of regions/towns and how could we do better
- Indigenous people and remote areas:
  - Food quality and other impacts in a timely and reliable way.
  - Access limitations with road safety consequences and access to community service needs.

Freight in urban areas - activity and logisitics-based freight modelling, congestion impacts, freight-land use conflicts and design codes

- Land use and freight planning
- Freight impacts of and on congestion
- Urban density and passenger and freight transport
- Zoning and design codes in support of transport infrastructure.
- Road safety impacts of high density development.
- Freight operation in a dense urban context
- A strong freight economics emphasis in:
  - Cost of congestion to freight movement in Perth metro.
  - Understanding commercial factors in freight container movement in Perth metro.
  - Commercial influences on freight modal choice in Perth metro.
  - How can govt best prioritise its investment across competing needs
- The cost of freight needs to be considered in dollar terms but also in congestion, social impacts, noise, rat runs, etc. – in an economic assessment basis

Cross-cutters

Making it happen - implementation

- Governance
  - Decentralisation of governance of local transport systems i.e. DOT vs Local Councils' roles and responsibilities
  - Planning and transport interface
    - How can we get transport to deliver good planning outcomes rather than trying to retrofit planning to transport decisions.

        - Look at places where it has worked well and why
    - Horizontal and vertical integration and land and transport planning. Vertically – in national, state and local government levels and horizontally at interagency levels via case studies and examples
    - How can government prioritise infrastructure investment decisions across all infrastructure types
- Making activity corridors work
- Enabling funding strategies
    - Infrastructure financing
    - The value capture proposition for infrastructure financing and other financing innovative solutions – affordable and funded – overseas and local examples.
    - Infrastructure Australia (IA) submissions could be considered and PPP funding options
- Institutional factors – level of decision making (centralised v decentralised).
- Cultural aspects of planning
    - Identify impediments to take-up of Liveable Communities Policy and how to overcome them

Enabling supporting data and modelling

- We don't maximise available info to greatest effect
- Meta-research – Assemble, consolidate and peer review available disparate research and related data.
- Learn from best practice examples of succesfull collaborations eg. Cochrane and Campbell Collaborations – both relating to the health industry
- Data and modelling
    - Transport data management to simplify the data requirements
    - Simplify and validate proxy measures and corrobarative data,
    - Improve access to "privatised" data
    - Reduce reliance on major periodic data collection exercises – rather collect on continuous/ongoing basis as per travel data in Sydney i.e.more systematic data collection and analysis
    - Simplify modelling.
    - Expand into areas of qualitative community aspirations and perceptions – collect qualitative as well as quantitative data.
- Freight modelling capability needed - activity and logisitics-based freight modelling – research into the validity and reliability of current assessments needed.
- "Urban informatics"
    - PATREC becoming an information portal as a research tool.
    - Needs analysis and methodological approach required
    - Access, data quality and control, and the use of the resultant data important component.

- Getting ahead of the game
    - Communication of current state of play and adaptations for future applications to "leap frog" our thinking to get ahead of the game for new and emerging developments.
    - Planning - Transport Atlas good way to communicate this.
- Communicate and make accessible current / Useful available data and Modelling
    - Useful information and models that have local/relevant/timely data could be accessed and made available to enhance what is currently available

    - Portal opportunities – select topical issue and capture related information useful for state and local government eg. a planning concern such as healthy, walkable neighbourhoods, portal could be a resource as an outcome of an ARC Linkage grant
- Indicators like Vampire Index a powerful tool for future land use and transport. The VAMPIRE (Vulnerability Assessment for Mortgage, Petroleum and Inflation Risks and Expenses) index identifies the relative degree of socio-economic stress in suburbs

Climate change

- Transport energy is an emerging area for future consideration
- Development footprint - mitigation and adaptation
- Cost abatement curves

2.4 RESEARCH QUESTIONS

A second stakeholder workshop was held on 22 February 2013 to further develop the previously identified research focus areas in more detail in the form of research questions.

Urban Form

Understanding the current growth situation

- What are the changing demographic needs, technological changes?
- What is the extent of the current mismatch between infrastructure (including housing) needs and provision?

Urban form models for accommodating the growth

- What works? Which urban forms generate less car use and more active modes of transport and sustainable outcomes?
- What are the impacts of 'not' limiting urban growth?
- Will D2031 infill targets be effective, can it make a difference and create a more sustainable urban form?
- How do we spatially represent the infill targets or plans?
- How do we future-proof areas for future growth through the conversion of station car parks to developments?
- How do you integrate transportation and land use along activity corridors to serve multi uses?
- Is the current 47% urban infill sufficient to create a sustainable outcome?
- Can we increase self-containment? Are there better ways to generate employment opportunities in dormitory suburbs?
- How do we redevelop middle ring suburbs which are less attractive to the markets?
- What are the impacts of active travel modes - walking or cycling - on urban form?
- How do alternative land use configurations perform in achieving higher levels of active transport?

Cost and benefits of accommodating the growth - multi-disciplinary evaluation of the performance of alternative models of urban form

- What are the costs of alternative urban forms e.g. greenfield development vs infill?
- What disciplines examine the urban form and what is the approach of each? (ie how does engineering evaluate the urban form)
- How do we move to a model that goes from affordable housing to affordable living?
- What are the transport costs and time costs and what are the trade-offs with housing costs?
- How can externalities be incorporated?

- What is the role of transport in generating social capital and wider economic benefits and employment self- sufficiency?
- What are the externalities and what are the numbers?
- What are the impacts on:
    - health
    - ageing population, ageing in place
    - climate-change
    - environmental integrity?

Modelling the growth –modelling and other tools to support the evaluation of alternative models for accommodating the growth

- What is the modelling landscape? Who? What? Where? Why?
- What are the land use-transport, benefit cost ratios including externalities?
- What would be the appropriate fit-for-purpose super model?
- How do we develop a nested, coupled model for transport and what does it look like?
- What do we do with what we have here?
- How do we integrate Land-use and transport models?
- What data exists and how can it be integrated?
- How do we incorporate behaviour scenarios into transport modelling?

Making it work

- How can we make the range of growth approaches work in the WA context?
- What are the barriers to facilitate sustainable urban form / function?
- How do we manage the integration of land use and planning?
- How do we accommodate different behaviours and levels of willingness to adopt best practice and mode outputs?
- How do we address/change behaviour which impacts adoption of model / science outputs?
- Should / how do we change public opinion?
- How do you get community buy-in for an alternative urban form – higher density (not high rise), active transport?
- How does our environment impact upon our individual interfaces and interactions?
- What are the governance / institutional arrangements that support integrated planning and transport?
- How we can work with Local Government to identify the opportunities for 'up-coding' urban areas to facilitate sustainable models or urban growth?
- What are the alternative funding options?
- How to develop and maintain appropriate budgetary allocations?

Urban Freight

Activity and logistics-based freight modelling

- What are the future freight demands and key corridors and terminals?
- Where, how much and what type of freight is going to flow?
- What is the form of the model required to effectively predict freight movement?

Urban freight economics

- What are the future freight demand and key corridors and terminals?
- What are the economic impacts of urban encroachment? (ie economic impact of not using Leach Hwy for its purpose)
- What are the relative costs of road and rail freight transport and what is the competitive framework?
- What is the impact of empty trucks on employment self-sufficiency

Freight-land use conflicts

- Understanding the impacts
  - Noise and vibration
    - Better understanding noise and vibration impacts – soil condition
    - What are the impacts of double track trains and diesel particulates?
    - High Wide Loads – economics of HWL pavements?
    - Particulates – emission and control?
    - Geo-mechanics (soil conditions, vibration set-back?
  - Safety
    - What are the safety impacts of high density development?
- Mitigating the impacts
  - What are the relative cost benefits of alternative efficiency measures?
    - grade separation
    - exclusive freight routes
    - potential geo technical engineering solutions? Could involve geomechanical test pad that enables us to experiment with vibration and noise
    - HWL pavements
    - emission control, soil conditions vs vibration setback
    - appropriate buffers – alternatives to noise wall
    - funding arrangements (non-governmental)

Demand Management – making the best of existing infrastructure

Intelligent Transport Systems (ITS)

- What is the applicability of ITS to WA?
- What is our readiness to adopt the technologies for maximum effect?
- How can the adoption and implementation be optimised in terms of
  - Timeframes?
  - Who leads this public or private sector?
- What is the best way to prioritise parts of the transport system for implementation (e.g. Fremantle Port)?
- How can WA transport infrastructure prepare for developments in ICT?
- What are the impacts of ITS on driver behaviour (driving simulator)?

Pricing mechanisms

- Effectiveness of different charging schemes
  - What are the cross-sectional effects of different charging arrangements? Impact on businesses / sectors, impact on low income people?
  - What is the effect of parking pricing on transport demand?
  - How effective is pricing at spreading the peak demand?
- Institutional arrangements
  - How can WA implement PPP in dedicated transport infrastructure? – facilitating discussion with Treasury and industry
  - What are the institutional frameworks needed to collect and distribute the resultant (road user charges) funds for investment in the road network (not necessarily traditional road authorities)?
- Acceptance
  - How is the public best readied for (accepting) road-user charging?
  - What is the contribution from changing behaviour? Quantifying the social contribution of changing travel behaviours
  - What are the behavioural responses to different pricing mechanisms (eg parking vs fuel)?

Socio behavioural factors

- What interventions work best? Why is TravelSmart only spending $2m/year?
- What drives travel behaviour beyond cost and time (attitudinal factors etc)?
- How do we incorporate behaviour scenarios into transport modelling?
- What is the impact of on-line purchasing on travel demand?

Regional Development

Aviation regulation

- What are the alternative aviation schemes which encourage greater tourism /individual travel beyond a just a FIFO focus, allowing greater access to regions?

Regional Centres

- What are the dynamics which explain the transport differences between broad regional environments (eg South West)
- How adaptable is transport infrastructure to the changing demographic structure of WA?
- To what extent does Broadband access replace physical travel movements?
- Why are some towns declining while others are experiencing rapid growth? What is the impact of sea and tree change aspirations? What are the relative transport needs?
- What is the effectiveness of decentralisation?
- What can the urban form and active transport (walking, cycling) discussion offer in terms of regional potential in FIFO and other communities?

Lack of inter-state agency integration

- Governance
    - How far should regional governance in the resolution of transport issues?
    - How can regional solutions be better implemented by state agencies which are primarily based in Perth?
    - How do you design enabling governance structures for conducting research in the regions?
    - How do we incorporate natural resource management in regional planning (relationship with DEC)? What are the natural resource impacts of transport planning?
- Data issues
    - How can the various data warehouses of the private sector and various levels of government be integrated?
    - How do we provide incentives to share data?

Indigenous people and remote areas

- How can resilience be achieved in remote areas?
- What are the cultural impacts of increased transport infrastructure?

2.5 OVERARCHING "BIG" RESEARCH QUESTIONS

To enable the expedient organisation, management and delivery of a PATREC research program, and to ensure strong multi-disciplinary approach, the identified research focus areas have been broadly grouped within the ambit of two big research questions:

- Research Question 1: What are the multi-perspective impacts of and solution for decoupling economic growth and liveability in metropolitan Perth – accommodating economic growth whilst retaining and enhancing quality of life?
- Research Question 2: What are the dynamics and mechanisms involved in building the competitive and collaborative advantages of the regions of WA?

The sustainable urban form, demand management and urban freight research areas would largely be incorporated as part of the research program designed to answer Research Question 1 while the regional development and transport research area will form part of the research program responsive to Research Question 2. The cross-cutting aspects of governance and institutional issues, enabling information and modelling and climate change will be incorporated into both research programs. Key research questions identified during the second stakeholder workshop held on 22 February 2013 are included as sub-questions:

- Research Question 1:
    - What are the sustainable models of urban form to accommodate growth and frame infrastructure investment – local and metropolitan scales?
    - How well do these models perform against a set of multi-disciplinary evaluation indicators?
    - What is the best integrated modelling platform for evaluating impacts?
    - How can demand be better managed to reduce the need for more infrastructure – intelligent transport, pricing mechanisms and socio-behavioural factors?
    - How can increasing urban freight levels best be accommodated in a dense urban context – economics of congestion and land use conflicts?
    - What are the implemented barriers – governance, funding, institutional and cultural?

- Research Question 2:
    - What are the most efficient modes of freight transport to overcome the tyranny of distance?
    - What is the role of transport in the different regional contexts and growing and lagging regions?
    - What are the demographic changes happening to explain why some towns are declining and others growing?
    - What are the impacts of rate of change in indigenous areas on transport and how is community resilience impacted by a changing transport context?
    - What governance arrangements could improve the Inconsistency and lack of uniformity in the networks and responses across the state?
    - What is the effectiveness of SuperTowns and Royalties for Regions in achieving objectives?

As part of the continuing process of establishing the PATREC research direction, the research focus area ideas captured in 2.3 together with the research question developed by stakeholders at the second stakeholder workshop as presented in section 2.4, will inform the development of each of these "big" questions into research program frameworks which will guide the formulation and development of research project proposals. The research questions may be amended and revised on the basis of iterative interactions with potential funders and human resource capacity, capability and availability.

2.6 DELIVERING ON THE FOCUS AREAS

2.6.1 Human resources

Core sponsorship funding from the collaborating partners provides:

- PATREC office
    - Director (0.6 FTE) – 5 year appointment

- Research Development Officer (0.4 FTE) – 3 year (UWA)
- Administrative Assistant (0.6 FTE) – 1 year casual appointment - to be converted to fixed term appointment (1.0 FTE) from 2014
- Advisory Board Chair (stipend)

The key responsibilities of the PATREC office will be:

- Daily operational management
- Advisory Board quarterly reporting
- Research project management
- Connection event management
- Stakeholder management
- Website/Information Portal
- Editorial Board management
- Strategic Business Plan
- Financial management
- Attract new funding

- PATREC core research team
  - Director (0.4 FTE) – 5 year appointment
  - Research Development Officer (0.6 FTE) – 3 year appointment (UWA)
  - Research Leaders (x2) (0.25 FTE) - 2 year, extendable appointment (x1 Curtin; x1 UWA/ECU)
  - PhD scholarships (x4) ($20,000/annum top-up scholarships) – 3 years
  - Postdocs (x2) (0.5 FTE) – 2 year, extendable appointment

  With some additional sponsorship and/or brokerage income, the core research team could be expanded to include:
  - Consultants – limited, as required

  Other than the Director, who has already been appointed, the core research team positions will be for a fixed term of 3 years. The positions of Research Leader will be advertised internally at the partner universities through calls for Expressions of Interest, responding to responsibilities listed below. The intention is to "buy-out" teaching time of existing senior researchers to enable them to commit time and effort to their PATREC leadership role.

  The positions of Research Development Officer and Postdocs will be advertised externally to ensure an excellent capability match with the PATREC key research areas and questions and also a good publication track record to ensure maximum success in attracting grant funding.

  All job descriptions and calls for Expressions of Interest will be circulated to the Advisory Board for comment prior to circulation. It is expected that the core research team will be mostly in place by mid-2013.

The key responsibilities of the core research team are to:

- Articulate project –level research questions within the broad framework of the strategic research focus areas and key research questions.
- Design innovative and novel, high impact project plans with short term wins as well as longer term contributions to the knowledge base.
- Assemble multi-disciplinary, multi-institutional research teams, including wider national and international collaboration linkages.
- Lead and prepare grant and contract research proposal submissions to leverage funding

- Appoint and schedule Research Advisory Committee/s.
- Quality assurance of publications through Editorial Board.
- Ensure publication targets met.
- Ensure presentation of results at conferences.
- Identify visiting experts.
- Identify and involve individuals with potential to receive PhD top-up scholarships.
- Identify and organise short courses – prepare short course material.

2.6.2 Financial resources

Income

The latest PATREC Collaborative Research Agreement (2012) commits the collaborating partners to a total of $420,000.00 per year for 2012, 2013 and 2014 and makes provision for the same or an amended schedule of cash contributions for 2015 and 2016. This core sponsorship amount essentially covers the salaries and operating costs of the PATREC office and some connection event costs. It is the "balance carried forward" funds which have accumulated during the last two years when little expenditure on research occurred, that allows for some research leverage. In order for PATREC to remain financially sustainable over the longer term, and to provide sufficient impetus for making an impact, PATREC will need to charge a "brokering" fee, levied as a percentage of the total cost of a contract or grant obtained where PATREC has added value. The exact mechanism for implementing this charge needs to be determined through further negotiation with the partner universities and in line with their particular infrastructure charging policies. In addition to brokering fees, the opportunity to sign up additional sponsors and charging fees for short courses exists to increase income levels. Potential funding sources include:

- Australian Urban Research Infrastructure Network (AURIN)
- Landcorp
- Landgate
- RAC
- Perth Airport Company
- Local Government
- Metropolitan Redevelopment Authority
- Regional funding bodies including Royalties for Regions
- Murdoch University, School of Social Sciences and Humanities (participated in preparation of State Planning Policy)

For the purposes of this strategic budgeting exercise, only "untied" income is included in the PATREC budget. The intention is that investment of this "untied" PATREC core income in research leadership, project development, proposal submission and research leverage, will yield "tied" research grants and contracts which will have expenditures of their own. While the number and value of these grants and contracts, "tied" to specific clients, are considered a key performance indicator for PATREC, together with publications flowing from the research, at this stage, the income and expenditure of these grants and contracts have not been included as part of the PATREC budget. It could be that in future, some of these grants and contract could be run as part of PATREC account but it may be necessary to also open a PATREC account as part of a Curtin University School to ensure equitable income earning potential.

Expenditure

The three main expenditure items for PATREC are:

- PATREC office
    - Salaries and staff development of the Director, Administrative Assistant and Research Development Office
    - Advisory Board Chair stipend
    - Operational costs including website maintenance, office expenses and minor equipment
- PATREC connection events
    - Annual Research Forum
    - Special topic conferences/seminars (4 per annum)
    - Visiting fellows (2 per annum) - travel and accommodation
    - Connection events - 2 per year
- PATREC core research
    - Research program leadership (2x Associate Professor (0.25 FTE/per annum for 3 years)
    - Research project capacity (2x postdocs (0.5 FTE/annum for 3 years)
    - Consulting (30K/annum*2 programs)
    - Student scholarships (4 PhD scholarship top-ups for 3 years)

Cash Balance

Three high level budget scenarios are presented to demonstrate the effect of varying income and research expenditure on cash balance (Table 1). Scenario 1, the conservative scenario, assumes no additional income other than the maintenance of the existing cash contributions of the partner institutions and the balance carried forward of unexpended funds. Please note that the sponsorship income in all Scenarios reduced in 2016 to $180,000. This is as a result of advance sponsorship payments by some parties which have been included upfront in the initial 2013 Balance Carried Forward line. A conservative estimate for research activities is limited to a Project Leader (0.25FTE) and two PhD top-up scholarships for each of the two research programs. PATREC office expenditure and costs of connection events are maintained as a constant for all three scenarios. Scenario 1 yields a cash balance of $103,057 at the end of 2016, but it would be expected that due to limited investment in research leadership, the return on investment in terms of research grants and contracts with associated publications would also be limited.

Scenario 2 assumes additional income of an average of $150,000 per annum sourced from additional sponsorship contributions, research brokering fees on grants and contracts obtained and short course fees. Assuming a brokering fee of 20%, a challenging $500,000 worth of grant and contract research income would need to be attracted to earn $100,000 fees with the additional $50,000 assumed to be recovered by additional sponsorship and/or short course fees. The cash balance returned by Scenario 2 at the end of 2016 is still positive but small. The additional investment in research capacity in the form of two postdoctoral appointments (0.5 FTE each) to support the two program areas together with some consulting expertise, are expected to deliver benefits in the form of more research grants and contract secured and additional publications and short courses presented (Table 1).

In Scenario 3, which is a compromise scenario, it is assumed that additional income earned though sponsorships, brokering fees and short courses will not be as high as in Scenario 2 i.e. only $100,000/annum on average and expenditure on research activities will exclude additional capacity from consultants. The Scenario still delivers a positive cash balance at the end of 2016 (Table 2).

The Advisory Board agreed that in 2013, the Scenario 3 or compromise option is followed in that no consultants are appointed initially but that new income opportunities are vigorously pursued with a view to converting to the more challenging Scenario 2 option as part of the review of the Strategic Business Plan in 2014.

Table 1: Income and expenditure scenarios and their effect on cash balance

Scenario 1: Conservative	**2013**	**2014**	**2015**	**2016**
Balance carried forward	1,175,859	1,081,566	843,206	560,683
Sponsorship income	420,000	420,000	420,000	180,000
New income	0	0	0	0
Total Income	1,595,859	1,501,566	1,263,206	740,683
Expenditure - Office	261,086	257,451	293,959	306,068
Expenditure - Research (0.4 Dir, 0.6 RDO, 2x leaders,4x PhD)	253,207	400,909	408,564	331,559
Closing Balance	**1,081,566**	**843,206**	**560,683**	**103,057**

Scenario 2: Challenging	**2013**	**2014**	**2015**	**2016**
Balance carried forward	1,175,859	991,566	673,206	360,683
Sponsorship income	420,000	420,000	420,000	180,000
New income (add sponsorship, brokering & course fees)	0	100,000	150,000	200,000
Total Income	1,595,859	1,511,566	1,243,206	740,683
Expenditure - Office	261,086	257,451	293,959	306,068
Expenditure - Research (0.4 Dir, 0.6 RDO, 2x leaders, 2x PD, 4x PhD, consult.)	343,207	580,909	588,564	421,559
Closing Balance	**991,566**	**673,206**	**360,683**	**13,057**

Scenario 3: Compromise	**2013**	**2014**	**2015**	**2016**
Balance carried forward	1,175,859	1,021,566	743,206	440,683
Sponsorship income	420,000	420,000	420,000	180,000
New income less (add sponsorship, brokering & course fees)	0	80,000	100,000	120,000
Total Income	1,595,859	1,521,566	1,263,206	740,683
Expenditure – Office	261,086	257,451	293,959	306,068
Expenditure - Research (0.4 Dir, 0.6 RDO, 2x leaders, 2x PD, 4x PhD)	313,207	520,909	528,564	391,559
Closing Balance	**1,021,566**	**743,206**	**440,683**	**43,057**

2.6.3 Management and operations

Project selection

The PATREC Collaboration Agreement (2012) provides for the delivery of research and training through "Projects" which the Advisory Board needs to select and approve. The process of project identification, selection and approval is as follows:

- Program Leaders appointed (2 programs)
- Develop Research Program Frameworks (RPF) (Program Leaders with Director)
- Develop Expression of Interest (EOI) request for projects in line with RPFs and with selection criteria (Director with Project Leaders)
- Circulate EOI to Advisory Board for comment (Director)
- Distribute request for EOI (Director)
- Evaluate project EOIs according to selection criteria and make recommendation to Advisory Board for discussion and approval
- Prepare full project plans for successful EOIs as first project deliverable, with quarterly milestones to be approved by the Advisory Board serving as the basis of the project contract and also serving as basis for funding applications
- Appointment – "contracting" of project team if not possible to proceed on the basis of the project plan only.

Selection criteria will be determined finally as part of the preparation of the request for EOI but will include aspects of:

- Addressing strategic direction of PATREC
- Integrated planning and transport focus - multi-disciplinary, multi-institutional research
- Novelty – knowledge gap
- Responsiveness to research needs and impact – responds to policy needs providing policy-evidence but has best potential for advancing knowledge base
- Publications to be produced – academic and policy-informing
- PhD's produced
- Potential for attracting funding
- Potential for short course delivery
- Connection events proposed
- Capacity to deliver - existing expertise and capability - building on strengths, track record of delivery
- Balance between producing shorter and longer term outputs
- Opportunities identified to collaborate with other research centres in cases where there is already where ready well-funded and on-going concerns.

Project Management

Once projects are underway, Program Leaders will report on progress against milestones on a quarterly basis for high level progress reporting to the Advisory Board. The reporting requirements will not be onerous but will be sufficient to enable the Director to identify whether the project is on track or if there are issues requiring attention. A reporting template comprising 3-4 questions on progress will be provided and the need for quarterly reporting will be included as a requirement in the project plan or contract.

2.6.4 Key Performance Indicators

Specific targets are set for 2013 as part of the business planning section but the broad key performance indicators 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 following list of performance indicators for PATREC has been compiled from the partner universities' policies on the establishment and review of research centres, supplemented with knowledge transfer indicators policy impact.

- Performance impacts for enhanced research capacity
    - Number of national and international competitive grants won
    - Number of top quality publications with above average citations produced
    - Number of high quality PhD graduates produced
- Profile impacts for improved competitive advantage
    - Number of excellent research staff and HDR students attracted and retained
    - Amount of external research funding secured
- Productive partnerships for institutional vitality
    - Generates national and international research interest
        - External attendance at seminars/events organised by the group
        - Number of '5 Star' visiting researchers
        - Number of invitations as Invited Speaker/conference Chair/Editorial Board;
        - Leadership in key international/national technical bodies;
    - Improves level of collaboration with other universities across globe
    - Fostering collaborative linkages between the partners and more widely
        - Number of joint projects with groups within and external to PATREC
        - Number of HDR students with joint supervisors
        - High quality, joint research outputs
    - Contributes to international/national societal interests
- Policy-relevant evidence for knowledge transfer
    - Demonstrated linkage of research projects to policy need
    - Number of peer-reviewed PATREC Working Papers published
    - Number of factsheets published
    - Number of conference papers presented at PATREC connection events and externally
    - Number of connection events
    - Number of short courses presented and attendance

2.6.5 Risks in delivering on the plan

The major risks identified in delivering on the plan are:

- Human resource availability;
- Human resource capability;
- Designing and implementing a viable financial model to ensure sustainable funding flows back into PATREC; and
- Maintaining active engagement of industry partners.

2.6.6 Independent review of PATREC

It is proposed that some form of independent review of PATREC be undertaken as input to the review of the plan for 2015-2019.

3 BUSINESS PLAN 2013

3.1 OUTPUTS

Key outputs envisaged in 2013:

- Two research program frameworks for the two big research questions
- At least four detailed project plans prepared and submitted for funding applications with a "basic" plan for continuing work on the project with no additional funding and a "comprehensive plan" indicating the work to be undertaken if additional funding applications are successful
- Baseline analyses for the two program areas (first deliverable of approved projects)
    - Presented at two special topic seminars to showcase the multi-disciplinary research
    - Published in two Working Papers
    - Published in two Fact Sheets
- Two connection events - one with visiting speakers (local and possibly national) – one to do with planning and transport information – AURIN and BITRE, Land gate
- Research Advisory Committees established and operation for each of the program areas
- Revitalised website
- Two ARC Linkage Projects proposals submitted
- Four journal articles submitted
- Four conference papers presented
- Audit of training courses and industry needs to identify gaps and collaboration opportunities

3.2 ACTIVITIES

The priority activities for 2013 reported against each of the key strategic activities are as follows:

Brokering multi-disciplinary, multi-institutional research in response to identified agency research requirements and knowledge gaps

- Establishment of two research programs
    - each with a clear research framework and questions based on the inputs received from stakeholders at the two stakeholder workshop held in December 2012 and February 2013
    - each with a Research Advisory Committee assembled to guide the program and project research direction and question development and ensure relevance to policy needs, with some wider participation as and when necessary to ensure early buy-in and alignment of research projects with needs and scientific rigour - to continue what was achieved in the workshop series.
    - each with a basic level of resourcing
- Commencement of the first tranche of Research Projects within the research program frameworks producing
    - Detailed Project Plans
    - Funding applications
    - Baseline analysis for presentation at two special topic seminars (one for each research program)

- Resourcing the research programs through the appointment of the following human resources form 1 July 2013 for a three year term:
    - Research Development Officer (1.0 FTE)
    - Two Program Leaders (0.25 FTE)
    - Two postdocs (0.5 FTE)
    - At least two PhD scholarship top-ups

Ensuring knowledge management and transfer through academic and less formal publications, connection events and an information portal as a reliable and accessible resource for researchers and policy-makers

- Have a plan included in the research program frameworks of proposed delivery of formal academic and less-formal publications as an essential research output in the form of:
    - Peer-reviewed technical working papers, overseen by an editorial board to ensure quality and published on-line
    - Factsheets on key findings for less academic audiences
    - Academic journal articles, books and book chapters
- Submit at least four journal articles
- Present papers at four conferences
- Initiate and conduct a range of targeted connection and communication events to inform and be informed of research and policy activities, products and findings in the form of:
    - Two topic-specific seminars arranged around the baseline analysis undertaken to date as part of each of the two research programs
    - Two connection events – one of which is arranged around the topic of enabling planning and transport information with invited speakers from BITRE and AURIN
- Prepare Board paper to recommending approach to use of social media to inform of activities and outputs to a wider, less targeted audience, including Twitter, Blogs, Facebook as appropriate and effective
- Revitalise, upgrade and update the website to be an Information Portal Version 1

Brokering the provision of training, predominantly in the form of professional development through short courses, executive programmes and "expert" courses on key topics, conducted in collaboration with other professional and industry bodies where possible

- Have a plan as part of the research program frameworks and project plans proposing a series of appropriate short courses, the material for which could feasibly prepared as a research output as part of project deliverables
- Prepare and audit of (1) available planning and transport undergraduate, postgraduate and professional and short courses and content which PATREC could potentially contribute to or fill a gap (2) industry needs

Attracting additional research funds through business development

- Identify and pursue a range of funding options, focused on local government, regional funding agencies, industry, Commonwealth and other local universities
    - Submit at least two ARC Linkage Projects proposals in September 2013
    - Identify at least two strong leads for additional funding
- Have a detailed business model in place for the "brokering" fee

3.3 BUDGET

The detailed budget prepared for 2013 (Table 2) is based on Scenario 3, which is the "compromise" scenario, as recommended in section 2.5.2. This scenario assumes no additional income earned in 2013 but that additional income earned from 2014 onwards, though sponsorships, brokering fees and short courses, will not be as high as in Scenario 2 i.e. only $100,000/annum on average and expenditure on research activities will exclude additional capacity from consultants. Further, according to the recommendation in 2.5.2, depending on the success of the pursuit of additional funding during the year, in the budget for 2014, it may be that the recommendation is to proceed with Scenario 2 which assumes an average of $150,000/annum.

On the expenditure side, Scenario 3 assumes that no consultants are appointment to supplement the research capacity provided by two Program Leaders, two postdocs and four PhD top-ups from 1 July 2013. While the expenditure has been estimated for budget purposes on the basis of a Project Leader, postdoc and two PhD top-ups for each of the two research programs, it is envisaged that in reality, the same budget could be expended differently within the two programs, or even, depending on the project proposal which are received in response to the EOI calls, the research budget may be expended differently across the two programs.

It was agreed by the Advisory Board that in 2013, the Scenario 3 or compromise option is followed in that no consultants are appointed initially but that new income opportunities are vigorously pursued with a view to converting to the more challenging Scenario 2 option as part of the review of the Strategic Business Plan in 2014.

Table 2: PATREC Budget for 2013 based on the Compromise Scenario (Scenario 3)

Scenario 3: Compromise	Budget	Notes
INCOME		
Balance brought forward (as at 31 Dec 2012)	1,123,561	
Balance including reversals of Feb13	1,175,859	
WA Government Grants	240,000	
Other Research Grants & Contracts		
Partner universities sponsorship	180,000	
"Brokering" and short course fees, add. sponsorship	0	Increasing in 2014 to $80K, then $100K in 2015 and to $120K in 2016
Total Income	**420,000**	
EXPENDITURE		
PATREC OFFICE	**402,293**	
Academic Salaries & On Costs	**263,371**	
Director	200,677	
Research Development Officer (from 1 July, top Level A)	62,694	
General Salaries & On Costs	**81,602**	
Administrative Officer	39,602	Go to full time in 2014
Salary Allowances & Staff Related Costs	32,000	Recruitment, relocation (postdoc)
Staff Training (registration, includes media training)	10,000	Conference and course fees (includes Media Training for Director)
Professional Fees & Consulting		
PATREC office operations	**34,000**	
Advertising, Marketing & Promotional (incl. website)	*15,000*	Website upgrade, maintenance, portal with some interactivity
Books & Periodicals	*1,000*	
Computing Costs	*1,000*	
Office Expenses	*13,000*	Printing, stationary, telephone, postage (average of past 5 years)
Minor Equipment Purchases (2 office laptops 2013)	*4,000*	2 laptops in 2013 for Administrative Assistant and Research Development Officer
Advisory Board Chair stipend-CPI-based	**23,320**	CPI-based increase - estimated at 2.5%/annum
Research program leadership and consulting		
Research program management – Assoc. Prof (0.25 FTE, Level C top) per annum X 2 programs from 1 July 2013	***45,000***	
Research project - 2x post-docs (0.5 FTE) from 1 July 2013	*60,000*	
*Consulting (30K/annum*2 programs)*	*0*	No consulting in 2013
Student related- 2x2 PhD scholarship top-up/annum from 1 July	**40,000**	20K*2 students*2 program scholarship top-up/annum for 3 years from 1 July 2013
Events (other expenditure, travel)	**27,000**	Events - 1 Research Forum, 4 special topic seminars, 2 connection events per annum
Annual Research Forum	*0*	No Research Forum in 2013
Special topic conferences/seminars (4 per annum)	*6,000*	2 special topic seminars in 2013 (2nd half)
Visiting fellows (2 per annum) - travel and accommodation	*15,000*	1 visiting fellow; Travel - Director, Research Development Officer, Program Leaders (2nd half of year)
Connection events - 2 per annum	*6,000*	2 connection events in 2013
Total Expenditure	**574,293**	
CLOSING BALANCE (including Balance B/F)	**1,021,566**	

3.4 KEY PERFORMANCE INDICATOR TARGETS

Indicators and targets set for 2013 are mainly input indicators for this re-establishment year. The Director's own KPIs have been included in parenthesis (Table 3).

Table 3: Key Performance Indicators and Targets for 2013

Key Performance Indicators	Input Indicators 2013	Targets 2013
Performance impacts for enhanced research capacity		
Number of national and international competitive grants won	Number of grant and contract research funding applications submitted	2
Number of top quality publications with above average citations produced	Number of journal articles submitted	4(2*)
Number of high quality PhD graduates produced	Number of PhD graduates planned in projects (excluding those supported with top-up scholarships)	4
Profile impacts for improved competitive advantage		
Number of excellent research staff and HDR students attracted and retained	Research Development Officer appointed from 1 July 2013 Postdocs appointed from 1 July 2013 Number of PhD top-up sponsorships awarded	1 (1*) 2 4
Amount of external research funding secured	Value of additional research funding proposed	$400K
Productive partnerships for institutional vitality		
Generates national and international research interest • External attendance at seminars/events organised by the group • Number of '5 Star' visiting researchers • Number of invitations as Invited Speaker/conference Chair/Editorial Board; • Leadership in key international/national technical bodies	Attendance number at stakeholder workshop and 4 connection events	150
Improves level of collaboration with other universities across globe	Number of international collaboration agreements negotiated	4 (2*)
Fostering collaborative linkages between the partners and more widely • Number of joint projects with groups within and external to PATREC • Number of HDR students with joint supervisors • High quality, joint research outputs	Number of joint projects approved Number of HDR student on projects with joint supervision Number of journal articles submitted with joint authorship	4 4 4
Contributes to international/national societal interests		
Policy-relevant evidence for knowledge transfer		
Demonstrated linkage of research projects to policy need	Number of project plans with clear policy links specified Number of Research Advisory Committees established and functional	4 2
Number of peer-reviewed PATREC Working Papers published	Number of Working Papers published	2
Number of factsheets published	Number of factsheets published	2
Number of conference papers presented at PATREC connection events and externally	Number of conference papers presented	4(2*)
Number of connection events	Number of connection events	4
Number of short courses presented and attendance	Number of short courses planned in project plans	4

*Director's own direct KPIs included in parenthesis