Applied Science, Engineering and R&D Audit

Follow-up from Audit

November 2014

TMR Applied Science, Engineering and R&D Audit

General Findings

Skills and capability are critical issues for the Department of Transport and Main Roads (TMR) going forward and that access to industry and academic knowledge is an important way to assist in accessing knowledge and up-skilling staff.

While some internal research capability is required (a very specific example of this being bridge design and repair in relation to older bridges now carrying heavier loads, which is leading edge work) the general consensus is that pure and to a large extent, applied research is best accessed externally.

There is the opportunity to significantly reduce costs to government when contracting out work, through access to superior ‘client’ knowledge. The recently formalised arrangement between the Australian Road Research Board (ARRB) and TMR specifically addresses this issue.

Some branches use their access to industry, funded contract service providers and academic partners to their advantage extremely well – for example, the Transport Safety and Engineering and Technology areas. However, on the whole, greater awareness of the broad gamut of opportunities that currently exist could be improved. There is a clear need to broadly communicate current and potential opportunities.

Where formal processes exist to bid for research funds it was generally agreed that they needed to be streamlined.

When asked about how an improved process might be structured it was generally agreed that it is important to have a ‘centralised’ policy and strategic direction and to ensure actual decisions on spend and delivery reside in the respective divisional branches. Care needs to be taken in the case of large projects which need a consistent approach across regions.

There are untapped opportunities to utilise knowledge from others both within TMR and external to it (other departments – geospatial capability being an example and of course industry stakeholders and academic partners).

Audit Recommendations

Recommendation	Status as at November 2014
General Recommendations	
1. Leadership and Governance a. Establish a 'TMR R&D Executive Panel' – chaired by a senior and appropriately accountable member of the Board of Management (BOM) – tasked with the strategic oversight of TMR's Research agenda and implementation of BOM/Director-General approved recommendations of this Audit. The role of this Panel would also be to advise industry, academic partners and Contract Service Providers on TMR's strategic expectations and priorities in order to better align research and innovation activities with these priorities and also, very importantly, to provide TMR with access to relevant new trends and global knowledge via participants and invitation.	Implementation of recommendations 2, 3 and 4 is being undertaken in consultation with key internal stakeholders rather than establishing a formal panel. TMR has been reviewing the effectiveness of existing committees.
b. Also consider the value of establishing industry reference panels where appropriate. An example of this would be that a number of industry representatives offered their services to TransLink in an advisory capacity in relation to new technology, service planning, contestability and so on, at no cost for the purposes of aligning industry and government strategic direction and the transfer of industry knowledge.	The proposed Transport Innovation Nexus project aims to foster innovation, build expertise and create new opportunities for research and industry. It will be a collaboration between TMR, other government agencies, researchers and industry.
2. Strategic Alignment a. Align science, engineering investment with broad cross-government science and research philosophy – that is, the R.E.D.S. Decision Rules. This cross departmental alignment needs further investigation but in broad terms asks the following questions, **R**eal Future Impact: Will the proposed R&D investment increase tangible positive net benefit/impact for the state/TMR?, **E**xternal commitment (increase in leveraged funding), **D**istinctive angle (its uniqueness for Queensland, and TMR) and **S**calability (critical mass) for the delivering on the investment to be undertaken.	Recommendations 2 and 3 are being implemented via the draft TMR R&D and Innovation Investment Framework, with five key policy principles for investing in R&D or innovation projects. These principles encompass the Queensland Government priorities, including the R.E.D.S decision rules as well as align with TMR's strategic direction. It is too early to evaluate the impact of the framework as it is not implemented across TMR yet. TMR will take a coordinated approach to delivering the Framework, the Transport Innovation Nexus project and the review of the ASTRA Agreement.

Recommendation	Status as at November 2014
b. Draft a Broad Policy/Set of Guidelines in relation to research spend, which have the authority of TMR's BOM. This establishes consistent policy methodology in relation to bidding for 'research' funding but the managing, prioritising and allocation of funding remains within regions and divisions, supported by a central repository of reporting. Some examples of items to be clarified in this broad document include – 'whole of life' costing, not done elsewhere, to be part of budget bids, results are monitored and are measurable, there is a direct correlation to TMR's strategic direction and so on.	Due to internal restructuring in TMR, final consultation including agreement of where the central repository of reporting will sit is yet to be determined. The proposed Transport Innovation Nexus project may also deliver this recommendation.
3. Evaluation Framework, and Performance Monitoring a. Draft a simple evaluation framework against which all existing and potential partnerships can be evaluated. Elements of this protocol should include (but not be limited to): i. Alignment with R.E.D.S. as discussed above, which represents the broad cross-departmental framework ii. Enhancing TMR capability and innovation iii. Providing an advocacy role where researchers promote TMR's strategic needs within their academic sector iv. Leveraging external funds and knowledge v. Targeting effort towards strategic TMR priorities vi. Measurability of outcomes.	The draft mentioned above, Investment Framework will contain evaluation and performance monitoring components. Its development and use will be coordinated to align with the review of the ASTRA agreement (due to expire 30 June 2015) and the Transport Innovation Nexus project. The proposed Transport Innovation Nexus project will be a collaboration with other government agencies, researchers and industry and aims to bring benefits to the Queensland transport system and economy.
b. Establish a monitoring process and define accountability - measure, record, monitor, review and disseminate knowledge. This process extends beyond the current situation which require departments to report on R&D spend as is formally defined by the Australian Bureau of Statistics. As mentioned the monitoring of the spend described here is based on acquiring 'leading edge knowledge'.	This has not been finalised and is linked to the Investment Framework mentioned above, which will be delivered in a coordinated manner with the review of the ASTRA agreement and the proposed Transport Innovation Nexus project.
c. Link all agreements to a process of skills transfer/enhancement (for example, ASTRA, ARRB).	This is part of the above framework and will be tested with the review of the existing ASTRA agreement, currently underway. As existing agreements come due for renewal, this will be highlighted as with when a new agreement is made.
d. Link all agreements to innovation initiatives. It is understood that an innovation program has been created within TMR. It is recommended that all agreements link to such developments.	This is being implemented as part of (e) below and through TMR's innovation program. The proposed Transport Innovation Nexus project will also be a consideration when agreements are made.

Recommendation	Status as at November 2014
e. In light of the above protocol, review existing partnership agreements with existing contract service providers and academic partners to ensure funding is linked to strategic direction, there is sufficient rigor to understand the definition of success, there is no duplication, actions are leveraged from a funding and knowledge perspective and there is a link to skills transfer back into the organisation.	This is underway and will be considered as part of the process to review the ASTRA Agreement, due to expire at the end of June 2015 and when other existing agreements are reviewed.
f. Identify exemplars (for example, ARRB model) to use as pro formas in producing budgets bids and monitoring progress.	The ARRB model has been identified and its application as a model, including associated documentation is being assessed.
4. Communication a. A formal communication strategy to advise on current research arrangements and priorities, the approach to the research task going forward and how skills and learnings can be accessed, utilising all available options (for example, internal departmental mechanisms, academic partners, industry, funded CSPs) - and based on the findings and recommendations of this report, when the BOM/Director-General approves, communicate with the relevant (a) academic partners/collaborators, (b) CSPs and (c) industry, expectations of them, and opportunities for them, from this fresh approach to TMR's management of its research agenda.	A draft communication strategy is being developed and will be finalised as the other related projects are progressed.

Specific Recommendations	
Academic Partners/Collaborators	
1. Be part of any arrangement that assists with gaining a better understanding of TMR's ongoing priorities and can be used to advise on leveraging opportunities.	The current academic partners are supportive of this recommendation.
2. Look for formal opportunities to be part of conferences, create relevant courses and so on.	This is done as part of the current partnership arrangements and will be considered as part of the review process.
3. Look to provide a stronger 'advocacy' role where appropriate.	This could be further investigated via the proposed Transport Innovation Nexus project and any partnership arrangements and will be considered as part of the review process.
4. Assist TMR to leverage funding opportunities (primarily academic research grants) that align with TMR needs.	ASTRA is currently working in this way and this will be considered as part of the review process.
5. Provide free of charge advice to TMR Divisions as part of the existing board arrangements.	This already occurs with our academic partners and will continue to be reviewed as agreements come due for renewal and enhanced wherever possible.
6. Look to engage 'best practice' opportunities as TMR looks to provide 'open data' to industry.	This can be progressed as part of the Investment Framework and the proposed Transport Innovation Nexus project and will be reviewed as part of any review process.
Contract Service Providers (CSPs)	Items 1–4 are being undertaken at time of review of existing contract arrangements.
1. Review CSPs alignment with TMR's direction.	
2. Ensure no overlap through the executive panel and monitoring processes.	
3. Target innovative thinking and new skills transfer.	
4. Consider ARRB as a model for ongoing agreements	

Industry Stakeholders	
1. Look for opportunities to engage industry stakeholders on project specific basis to assist with developing key ideas (for example, industry review panels, invites to internal skill and knowledge sharing events).	The proposed Transport Innovation Nexus project will provide an opportunity to build partnerships with industry. The long-term transport strategy will also provide opportunity to engage key industry stakeholders.
2. Examine the use of 'pilots' in partnership with industry to test new ideas. This will necessitate a review of procurement processes.	The proposed Transport Innovation Nexus project will provide an opportunity to pilot new ideas in partnership with industry.
3. Look to engage industry in the partnership arrangements established with academia where sensible	As above.
TMR Staff	
1. Better utilise funded CSPs and academic partners to assist in filling knowledge gaps.	This will be delivered through projects like the proposed Transport Innovation Nexus project and the long term transport strategy.
2. Provide guidance as to the availability and use of funded support mechanisms currently available and potential partnerships.	This will be delivered through the communication strategy.
3. Look to intra-departmental and inter-departmental communication mechanisms to provide awareness of the availability of alternative knowledge and solutions.	As above.