Australasian Centre for Rail Innovation

SUBMISSION TO THE

SENATE ECONOMICS REFERENCES COMMITTEE

INQUIRY INTO

AUSTRALIA'S INNOVATION SYSTEM

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Executive Summary

The Australasian Centre for Rail Innovation (ACRI) is a not-for-profit organisation formally established in July 2014 to provide **professional, independent applied research, strategic analysis, advice and innovative solutions** for the Australasian rail industry and the transport sector more broadly.

ACRI has been created following the completion of the CRC for Rail Innovation, to continue the legacy of the CRC, but more importantly, to deliver a **new model by which industry can direct research funding to suit its own needs.**

ACRI is in a unique position in that it is supported by all the major rail entities and jurisdictional governments, and has partnered formally with several Australian research institutions to deliver innovation to the rail and wider transport sector.

The aim of this submission is to explain how the ACRI model will contribute to innovation and economic progress while supporting Australia's research sector, the driver behind the establishment of ACRI and how the model is able to amplify investment in innovation ensuring that return-on-investment is maximised for every dollar spent. This efficiency gained from this model makes a strong case for federal government contributions to supplement the investment already made by the states and industry. This investment would further improve the efficiency of rail and the transport sector more broadly while increasing economic benefit to Australia at a time when infrastructure investment is the subject of much debate.

To discuss this submission in more detail, please contact **Vicki Brown**, Executive Director of ACRI
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Recommendations

The Australasian Centre for Rail Innovation (ACRI) recommends:

1. that the Senate Economics Reference Committee inquiry into Australia's Innovation System, considers the new, independent operating model demonstrated by ACRI as a suitable post-CRC model and endorses the model for wider use across other sectors;

2. that members of the Senate Economics Reference Committee inquiry into Australia's Innovation System consider granting ACRI an audience to further present our organisation and provide the opportunity for Committee members to raise questions or discuss issues they may have in relation to ACRI's operating model;

3. that the government supports the rail and transport sector by directing funding for innovation through the established ACRI mechanism, to ensure maximum benefit can be achieved for industry and research providers in Australia.

1 Introduction

The importance of rail to the Australian economy cannot be underestimated. The Australian rail network consists of a total of 41,461 km of railway (the sixth largest rail network in the world) and in 2011–12, the domestic freight task totalled almost 600 billion tonne kilometres (that is equivalent to about 26 000 tonne kilometres of freight moved for every person in Australia).[1] In addition to this, urban passenger rail had 769.9 million passenger journeys in 2010, and non-urban passenger rail had 13.38 million passenger journeys in 2010. With such a significant proportion (49%) of all freight movements and with a significant number of passenger journeys, rail plays a central role in the Australian transport infrastructure network.

The pressure on the rail network is set to increase in the coming years, with growth in Australia's freight task projected to continue over the next two decades with total domestic freight projected to grow 80 per cent, between 2010 and 2030.[1] Demand for passenger transport is also becoming stronger and the forecast of significant population growth will continue to increase demand for passenger transport. When considered alongside the statistic that an increase in logistics total factor productivity of just 1%, leads to an estimated increase to Gross Domestic Product (GDP) of $2 billion,[2] **it is imperative that innovation and research keeps pace with the escalating demand on infrastructure.**

The work of the Senate Economics References Committee inquiry into Australia's Innovation System is an important step in ensuring that the new organisation, the Australasian Centre for Rail innovation (ACRI), established following the completion of the CRC for Rail Innovation, is able to maximise the opportunity to improve on previous initiatives and ensure that Australia is taking a pro-active approach to innovation across the rail and wider transport sector.

2 The CRC for Rail Innovation

The Cooperative Research Centre (CRC) for Rail Innovation was established in 2007 to provide a focal point for investment in research and innovation in the Rail Sector. With a high level of investment, the CRC for Rail Innovation delivered research outcomes on behalf of government and industry over the course of its seven year lifespan. Having delivered a number of successful outcomes for the sector, the CRC for Rail Innovation leaves a legacy of research outcomes that will remain useful to the sector both now and in the future and it is important that this legacy is preserved.

The CRC's main strength was its role as the collaborative rail research organisation for the Australasian Rail Industry, a role which provided a focal point for the sector through which

[1] Bureau of Infrastructure, Transport and Regional Economics 2014, 'Freightline 1—Australia freight transport overview'

[2] Australian Logistics Council 2014, 'The Economic Significance of the Australian Logistics Industry'

innovation could be channelled. With the completion of the CRC for Rail Innovation in July 2014, a new model for undertaking research and strategic analysis was considered necessary to ensure that research outcomes met the needs of industry more comprehensively, while ensuring the outcomes delivered by the CRC continued to be made available to the sector.

3 The Australasian Centre for Rail Innovation

The Australasian Centre for Rail Innovation (ACRI) was established to take the research and strategic analysis task forward for the Australian Industry. ACRI is a not-for-profit organisation launched in November 2013 and commenced full operations on 1 July 2014. The role of ACRI is to provide professional, independent applied research, strategic analysis, advice and innovative solutions for the Australasian rail industry and transport sector more broadly.

ACRI will also undertake investigation of and act as a conduit for the transmission to the Australasian Rail Industry of existing Australasian and international research outcomes or solutions, while actively working to maintain the legacy of the CRC for Rail Innovation.

Without ACRI, the investment in thirteen years of collaborative research both by the CRC for Rail Innovation and its predecessor, the CRC for Railway Engineering and Technologies would effectively be "stranded" both in terms of research outcomes, build-up of capability and international recognition.

By ensuring the outcomes from the CRC remain accessible to the sector while ramping up to deliver a range of new innovations, ACRI will establish Australia at the forefront of research in the global rail and broader transport sector.

Having already undertaken some economic analysis in the sector, ACRI is now preparing to deliver several work programs to the rail industry in Australia and New Zealand. These include programs to benefit Heavy Haul, Track Operators, Freight Rail and Passenger Rail, and to meet the policy objectives of Transport Departments.

4 ACRI: An Independent Entity

ACRI has a Board of Directors chaired by a person who is **independent of industry, government and research providers.** ACRI's independence is further supported by a Board with membership from both industry and Government. Independence is critical in achieving acceptance of research outcomes. In particular, research which is perceived by the community to be biased in a particular direction is unlikely to provide convincing answers to community issues. ACRI's independence will help achieve community acceptance and therefore a "Community licence" in respect of research and solutions focussed on the recurring issues faced by the industry, government and the community.

The ACRI Board comprises of the following membership:

Chairman:

- **The Hon John Anderson AO**, former member of the Federal Parliament with responsibility for the portfolio of Transport and Regional Services and Deputy Prime Minister.

Members:

- Vicki Brown, Executive Director, ACRI;
- Ken Matthews, Independent Director with Research Experience;
- Neil Scales, Director-General, Queensland Department of Transport and Main Roads;
- Matthew Dowd, General Manager Railroad Operations, BHP Billiton;
- Heath Harnden, General Manager - Railways Maintenance, Rio Tinto;
- Greg Pauline, Managing Director, Genesee & Wyoming;
- Rob Andrews, Chief Executive, National Rail Safety Regulator;
- John Cowie, Principal Rail Technical Services, Fortescue Metals Group Ltd;
- Mark Wild, Chief Executive Officer , Public Transport Victoria;
- Murray Cook, General Manager Strategy and Development, Brookfield Rail;
- Tim Ryan, Executive General Manager Enterprise Services, ARTC;
- Natalie Pelham, General Manager National Strategic Review & Priority Initiatives, Transport for NSW.

5 The New ACRI Model

In addition to ensuring the continuation of the legacy of the CRC for Rail Innovation and maintaining a research capability in Australia, ACRI was created to meet the needs of industry by introducing a **new and improved model of operation** for the delivery of innovation to the rail industry and the transport sector more broadly.

ACRI operates by a series of agreements with partners from across the sector, called 'Participants'. Participants can join ACRI as part of agreed work programs, individually for commissioned work, or both. The Agreed Work Programs that form the central part of the ACRI model allow organisations to pool their resources thereby improving outcomes for the entire sector rather than on an individual basis. This approach not only achieves a funding multiplier effect through pooling of resources, but also economic benefits from harmonised or standardised outcomes across Australasia.

While the focus is primarily on Rail, work will also be undertaken on broader transport issues that impact all modes. The exact nature of the research or strategic analysis undertaken will be determined by Participants. This model has been established to ensure that Participants have the ability to direct research and strategic analysis towards areas of greatest need or interest to their organisations. For example, ACRI's Heavy Haul work program will focus primarily on efficiency in the operation and use of Heavy Haul networks to deliver direct cost-savings to industry. This will

serve to improve the profitability of the sector, leading to improved economic outcomes for Australians.

By operating an improved model by which industry engages with research institutions to direct research priorities, ACRI will ensure research is of direct relevance to the each Participant. Research outcomes or solutions will be shared amongst Participants, so that outcomes from one work program can also benefit Participants in other work programs.

To deliver these work programs, ACRI has established agreements with Australia's leading universities. These partnerships will assist in maintaining an Australian rail and broader transport research capability which has long term economic benefits for Australia.

ACRI does not have a membership fee. All contributions, by Participants, are directed to those agreed work program areas determined by the Participant. There is a small administration and project management fee attached to all projects to support the tightly controlled corporate office.

ACRI is demonstrating a viable 'post-CRC' model that is less reliant on Federal Government funding and delivers innovation in a way that better meets the requirements of industry. This will lead to diversification of science and research financing while accommodating industry and government priorities.

6 Investment in Innovation

The Australasian Centre for Rail Innovation (ACRI) is ideally positioned to coordinate investment in innovation across the rail and wider transport sector. With Participants including key industry representatives as well as representation from all jurisdictional transport departments, **ACRI is already working to attract investment in innovation** across Australia and New Zealand and targeting research to meet the needs of Participants.

The research being undertaken will deliver real benefits to Australians; from important work into safety at Rail Level Crossings which will ultimately save lives, to improving efficiency in the transport of industry products to maximise the profitability of key Australian export commodities such as iron ore and coal, which will lead to the continued viability of these industries.

This mechanism for investment is important in ensuring that research output is translated into wider social and economic benefits for Australians and promotes investment from industry.
ACRI's role in the facilitation of research investment and the sharing of mutually beneficial outcomes across the sector cannot be underestimated and the benefits of attracting investment from key industries within Australia will have direct and positive impacts on the economy.

Many of the economic benefits of research investment come from extending the useful life of existing infrastructure, thereby delaying the requirement for additional infrastructure investment.

Delaying the need to invest in physical infrastructure is particularly important as the physical infrastructure bottlenecks in many capital cities are in built up areas where retrofitting is particularly expensive. By delaying infrastructure investment though the use of new technology, substantial and direct savings can be made, enabling investment in other economic priorities.

Another major economic benefit of investment in rail research, in particular, comes from the increased use of rail. By enabling more efficient, safer use of the existing infrastructure, the movement of people and goods is shifted away from the increasingly congested road network generating less cost to the economy in terms of congestion, carbon emissions and accidents.

The wider economic benefit of investment in research comes in addition to the direct savings experienced by those within the sector.

7 Research Competitiveness on the International Stage

ACRI has established a number of Strategic Research Participant Agreements with key research institutions within Australia. It is the aim of ACRI to ensure that Australia maintains a strong research capability to support the sector. By becoming a Strategic Research Participant of ACRI, **research institutions receive targeted research funding to deliver innovation projects** on behalf of other ACRI Participants. This direct relationship and funding model is essential in supporting research institutions in attracting and retaining key skills relevant to innovation in the transport sector.

This will benefit not only the Participant institution. The attraction of research funding facilitated by ACRI will contribute directly to Australia's ability to attract, fund, train and retain a healthy research and innovation workforce. This will improve Australia's standing in the international research community and help contribute to Australia being a desirable destination for researchers, improving the skilled workforce and leading to further investment in Australian research.

In addition, ACRI is directing funding to research institutions specifically to engage postdoctoral researchers specialising in the transport sector. By committing a significant amount of investment over a number of years, ACRI will directly support and influence the ability of Australian research institutions to attract, retain and expand their expertise in transport innovation, providing a boost to Australia's ability to maintain a healthy and active research capability. Specific engagements of this type ensure that the full range of projects planned for delivery by ACRI will have guaranteed access to the most qualified personnel, enabling delivery of research outcomes to a consistently high standard.

The research networks and initiatives developed by ACRI will also assist with training of both Masters and PHD students. While a key research project may require a single lead researcher, typically there are a number of more junior positions available to support the research activity, leading to training and encouraging career development within Participant institutions.

To complement the strong links ACRI has founded between Australian industry, government and research institutions, partnerships are also developing internationally with the aim of not only undertaking joint projects but to ensure that developments overseas can be adapted to the Australian transport sector and implemented without needing to 'reinvent the wheel'. By seeking collaborative agreements with key partners internationally, ACRI will seek to maximise the available innovations for the Australian sector while at the same time, sharing research outcomes for the benefit of partner nations.

By doing so, the reputation of Australia as a modern and forward thinking innovator can be reinforced around the world, which in turn will contribute towards increasing Australia's research competitiveness on the international stage.

Formal partnerships have already been established with the RSSB (UK) and the Federal Railroad Administration (USA), taking the form of Memoranda of Understanding for shared access to research data and outcomes that may be of mutual benefit to the respective nations. In addition, ACRI is also a member of the UIC International Rail Research Board. This has been achieved since ACRI was launched in November 2013. ACRI will continue to reach out to overseas partners who can benefit the Australasian rail and the wider transport sector.

8 Industry Access to Technology

A key benefit of ACRI's new operating model is that Participants from industry or government will obtain access to innovation outcomes delivered across ACRI's full portfolio of works. This means that a small rail operator, contributing a relatively small amount, will have access to innovations funded by larger industry players capable of investing far more in research. This equitability of access will provide support for small or emerging industries, operators and manufacturers across the transport sector, thereby encouraging growth and improving their competitive advantage both within Australia and internationally. The model will help establish relationships between advanced manufacturing and a dynamic innovation culture, while streamlining investment in innovation for the benefit of all Participants.

In addition, **the creation of a new Rail Manufacturing CRC has provided ACRI with an opportunity to establish a key partnership within the rail sector**. ACRI is working closely with the Rail manufacturing CRC to ensure the transport sector can establish a direct link with advanced manufacturing.

9 Efficiently Targeting Funding

To ensure Australia remains at the forefront of global innovation and remains an attractive destination for highly skilled workers, targeted research funding specifically to support transport infrastructure is essential. With a large investment in road infrastructure proposed by the government and large new rail projects such as Inland Rail now progressing, it is important that innovation in the transport sector is also supported.

ACRI is now preparing to deliver several large innovation programs on behalf of industry and has already established forums by which industry and government can meet to determine research priorities. Forums such as these bring parties together to agree priorities for investment; ensuring funding is directed by those at the cutting edge of transport in Australia.

Currently, with investment provided primarily by industry and the states it is inevitable that a number of research programs deemed high priority by participants will not be able to progress. Attraction of additional funding to this mechanism will provide an efficient boost to innovation in the sector by building on the state and industry funding to drive further benefit from the established model.

Additionally, investment through the ACRI model will be channelled directly to Australian research institutions serving the transport sector. Such funding will provide additional highly-skilled jobs and enable development and solidifying of emerging career paths, in particular for early and mid-career researchers at these institutions. Flexibly funding Australian industry priorities through Australian research institutions will not only serve to boost the specific industries and institutions involved, but by increasing investment in innovation will build and enhance a dynamic innovation culture in Australia.

Funding this mechanism will lead directly to measurable innovation with very little administrative overheads due to ACRI's delivery model already being established and resourced to deliver. With the proposed 'Precincts' for Transport no longer progressing, ACRI are able to provide the vehicle by which funding can lead directly to technological advancements, without requiring the creation of new organisations and the costs associated with this.

A good indicator of the viability of the ACRI model is seen by the strong representation from both industry and state governments on the ACRI board, helping to direct research strategically and targeting investment towards the projects most likely to result in direct and practical innovations. It is our belief that **even moderate amounts of Federal funding would generate wide-reaching benefits for the transport sector**, which in turn would benefit the wider economy. We would welcome the opportunity to present our case in person and discuss opportunities directly.

10 Recommendations

The Australasian Centre for Rail Innovation (ACRI) recommends:

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