

# Project 1.3

## The Future of Roads: The Role of Road Building in Reducing Environmental Pressures and both Mitigating and Adapting to Climate Change

RESEARCH PROGRAM 1: GREENING THE BUILT ENVIRONMENT

Roads are a national and economic necessity and provide significant economic benefits to societies. Roads are also significant greenhouse gas contributors due to emissions from mining, transporting, earthworks, paving work and vehicles. The aim of this project is to:

- 1 Identify materials, technologies and processes for the delivery of roads that reduce environmental pressures from road building;
- 2 Investigate the potential for adaptation to climate change and peak oil of material use, construction, maintenance and disaster management processes in road building; and
- 3 Investigate the opportunity for using road reserves to contribute to the mitigation of climate change and strengthening infrastructure resilience.

### Project Outcomes

To investigate ways to reduce environmental pressures from road building, the project aims to:

- Undertake a literature review, complimented by selected semi-structured interviews;
- Investigate best practices in reducing toxic and greenhouse gas emissions, protecting watersheds, reducing landfill use, and protecting adjacent ecosystems; and
- Investigate the potential for improvements in road construction practices to result in greater fuel efficiency of road users.

To investigate the potential for adaptation to climate change and peak oil, the project will:

- Undertake a literature review, complimented by selected semi-structured interviews to form the development of a base framework for 'Sustainability Assessment Framework for Road Infrastructure' (SAFRI);
- Investigate impacts on road building from climate change, including changes to average storm frequency and intensity, increase in average temperatures, and potential for coastal inundation of road infrastructure;

- Investigate the impacts on road building from peak oil, including increases to fuel costs, vehicle fuel switching, and modal shifts in freight transportation; and
- Using SAFRI, undertake a comparison to current national practices to identify opportunities for improvement.

To investigate the opportunity for utilising road areas to contribute to the mitigation of climate change and strengthening infrastructure resilience, the project aims to:

- Undertake a literature review, complimented by selected semi-structured interviews, and informed by AGIC, to form the development of a base framework for 'Sustainability Assessment Framework for Road Infrastructure' (SAFRI);
- Investigate the role of roads through improving the resilience of socio-ecological systems, including an interrogation of the fundamental assumptions driving road design, delivery and use;
- Investigate and assess the potential for roads to act as carbon sinks, areas for generation of renewable energy, and spaces that can be retrofitted to accommodate modes of public transport; and
- Using the ISSRI scenario planning methodology, interrogate a range of innovative scenarios to consider the availability, reliability and cost of existing and emerging options, considering the likelihood of adoption and appropriateness of each scenario in the context of various socio-economic and environmental conditions.

Project partners include: Parsons Brinckerhoff, John Holland, Queensland Transport and Main Roads, Main Roads Western Australia, Australian Green Infrastructure Council, Curtin University, and QUT.



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