

***Leveraging R&D investment for the
Australian built environment***

Case Study Findings - Road Construction Safety

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**Sustainable
Built Environment**
National Research Centre

Presentation Structure

Introduction

The QTMR initiatives

Data gathering & analysis

QTMR findings

Questions?



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Our Mission

To be an enduring world-class research and knowledge broker in sustainable infrastructure and building design, construction and management



Sustainable
Built Environment
National Research Centre



Program 1 - Greening the Built Environment

Program 2 – People, Processes and Procurement

Program 3 - Productivity through Innovation

- » **A nation-wide collaborative research centre**
- » **Industry, government and research partners**
- » **Applied research and industry outreach across three integrated themes**

Core Members



Queensland Government
Department of Transport and Main Roads



Transport
Roads & Maritime
Services



Queensland Government
Department of Public Works



Department of Treasury and Finance
Building Management Works
Office of Strategic Projects
Main Roads Western Australia
Department of Commerce



Queensland Government
Infrastructure and Planning

**PARSONS
BRINCKERHOFF**



Curtin University

Australian Construction Industry

- \$60b pa turnover
- Employs 1 million people
- 250,000 firms - many small firms ...



Australia's R&D spend is 2% of GDP compared to:

- Denmark & US 2.5%
- Finland & Sweden > 3% (DIISR 2010:3)

Australian Government targets:

- 25% increased business engagement in innovation in next 10 years
- responses to climate change; improving workplace innovation capabilities; & business innovation



Project 2.7 - Leveraging R&D investment for the Australian built environment

Project Phases:

1. Audit R&D investment since 1990
- 2. Case studies of past investment**
3. Develop a strategic roadmap for future R&D
4. Develop policy guidelines to maximise the value of R&D investments



Phase 2 - Case Studies

Examine mechanisms & impact of key past investments in research & innovation -

- 1. Road construction safety - QTMR**
2. Green Building – Western Australian Gov.
3. Digital Modelling - QDPW



Thermal imaging camera unit

- Outcome of 14 incidents since 2003 & discussions with NSW RTA/RMS
- Early indication of possible collisions
- 6-week trial including operator's feedback

Positive effect in reducing speeds & visuals around work sites.



Mechanical traffic aid



- Key finding of *2009 Ombudsman* report*: around road work sites
- Desktop research identified use - Asia, Europe, & Australia
- Discussions with Tweed council – led to the trial
- Trial at 3 sites:
 - effective in reducing speeds
 - useful in night works & proximity to ‘live’ traffic

* *Queensland Workplace Rights Ombudsman Report on Traffic Control (2009)*



Trailer-based CCTV

- Key finding from *2009 Ombudsman* report: driver behaviour, especially traffic controllers
- 3-month trial (2010) at major sites -video monitoring & road signs

Effective in modifying driver behaviour.
QPS can investigate traffic breaches.



* *Queensland Workplace Rights Ombudsman Report on Traffic Control (2009)*



Data gathering

- Departmental reports
- Meetings
- Literature review
- Interviews



Executive	1
Champion	1
Project Leader	1
Implementer	1
Allied Agency	2
Supplier*	2
Industry Rep.*	1
Researcher*	1
	10

* External interviewees



2 step analysis

Step 1 – compile drivers, implementation activities; processes; impacts; successes; barriers; R&D activities and engagement

Step 2 - Interview data analysed & coded against criteria based on academic theory:

- *Absorptive capacity*
- *Dynamic capabilities*
- *Open innovation*



Leveraging R&D investment for the Australian built environment

QTMR CASE FINDINGS



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Drivers for initiatives

- Risks to road workers & travelling public
- Vehicle safety
- Current research projects
- Implementation of new technology
- Road work operations
- Other government reports



Implementation activities

- Deployment & implementation guidelines
- Communications with stakeholders
- Procurement requirements
- Alignment to MUTCD* & other regulations
- Funding requirements
- Legal & privacy issues
- Staff education & training



* Manual of Uniform Traffic Control Devices



Impact on values / culture



- QTMR's cultural change program
- Benefits of new technology
- Work site deployment & contractor expertise
- Awareness & understanding
- R&D initiatives
- Staff education, training & communications



Impact on supply chain

- Knowledge sharing across industry
- Workforce & union implications
- Technology available locally
- Industry funding
- Work site management



Successes

- Better risk identification
- Greater industry awareness
- Changed driver behaviours
- Improved safety at work sites



Barriers

- Lack of time & resources
- Internal awareness
- Negative perceptions
- Speed of research
- Technology deployment
- MUTCD requirements
- Design & manufacturing issues
- Internal procurement delays

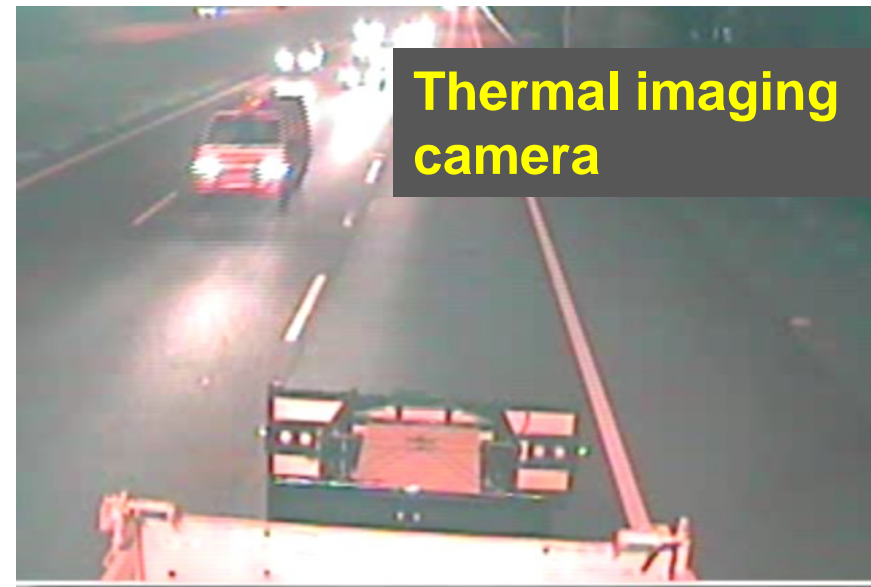
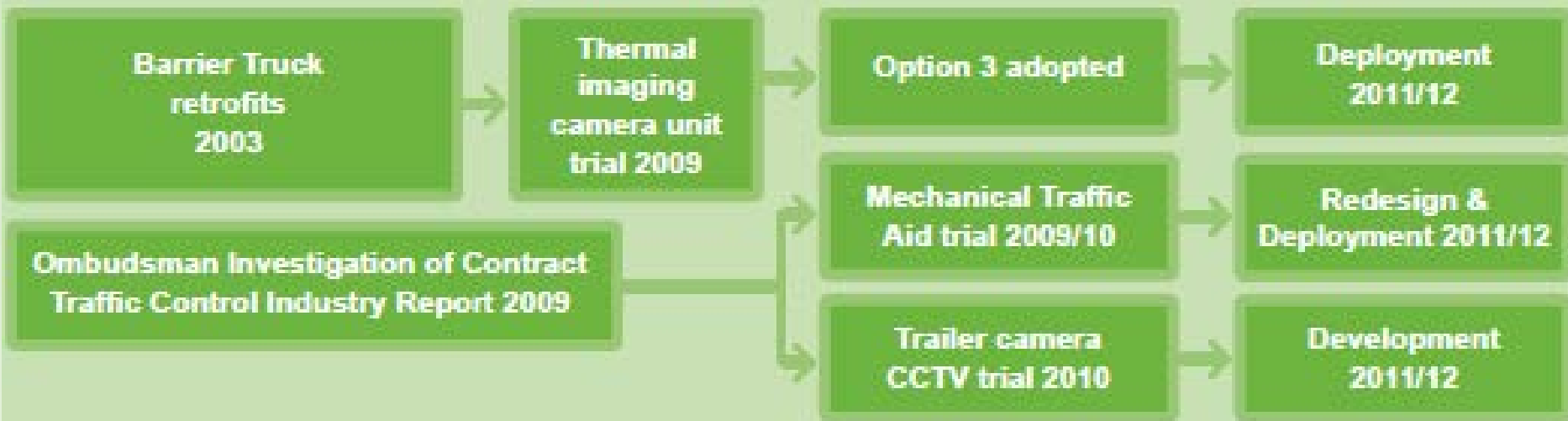


R&D engagement & activities

- QTMR's R&D funding
- Better technology & outcomes
- Role of R&D Senior Advisor is key
- Industry benefits
- Innovation
- Role of academics
- R&D increases safety



Pathway to innovation



Capabilities exhibited

- Product & process development
- Organisational learning
- Customer focus
- Alliancing - industry associations & contractors
- Technology transfer
- Internal R&D engagement



Note: As coded for more than 80% of interviewee responses



Taking advantage of new knowledge

- Development of new products
- Staff skills & training
- Awareness of customer needs
- Technology development



Innovation pathways

- Abundant knowledge landscape – both internal & external
- Outbound flow of knowledge & technology

Note: As coded for more than 80% of interviewee responses

Criteria least coded

Coded by researchers from interviewee responses



- Time & cost
- IP creation & management
- Metrics for innovation performance

Impacts & Outcomes of initiatives

- *Thermal imaging camera* – now being installed in 27 Barrier Trucks
- *Mechanical Traffic Aid* - currently being redesigned re specs & deployment guidelines
- *TrailerCam* - approved for implementation; deployment guidelines being incorporated into QTMR's systems





Innovation Underpinning Australia's Infrastructure and Building Industry

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Research Program 1: Greening the Built Environment

Research Program 1 will deliver improved environmental performance by the built environment through enhanced ecological efficiencies, including carbon emission reductions and climate change adaptation...

[Read more...](#)

Projects

- Design and Performance Assessment of Commercial Green Buildings
- The Future of Roads: The Role of Road Building in Reducing Environmental Pressures and Both Mitigating and Adapting to Climate Change
- Harnessing the Potential of Biophilic Urbanism in Australian Cities
- Sustainable Infrastructure Procurement

Research Program 2: Developing Innovation and Safety Cultures

Research Program 2 will deliver improved social outcomes for built environment workers and the Australian community through increased uptake of sustainable practices and minimising...

[Read more...](#)

Projects

- Safety Impacts of Alcohol and Other Drugs in Construction
- Offsite Fabrication and Links to Product and Process Innovation
- Leveraging R&D for the Australian Built Environment

Research Program 3: Driving Productivity Through Procurement

Research Program 3 will deliver economic, environmental and social benefits to the built environment industry through reductions in risks and costs and improved productivity...

[Read more...](#)

Projects

- Collaborative Object Libraries Supporting the Facility Lifecycle
- Supporting Infrastructure Management by Combining Sensors and Asset Information Models

Prior Research Program: CRC for Construction Innovation



Our Research

Publications and information on research undertaken by the CRC for Construction Innovation is available at:
www.construction-innovation.info

Thank you for your attention ...

QUESTIONS?

Project Partners



Department of Treasury and Finance
Building Management Works
Office of Strategic Projects

