Evaluating the impact of fatigue laws in Australia on heavy vehicle driver alertness

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CRC ALERTNESS SAFETY AND PRODUCTIVITY

Australian Government Department of Industry, Innovation and Science | Business Cooperative Research Centres Programme

CRC Alertness, Safety and Productivity

Alertness CRC

- A$14.5 million from government and A$60 million in in-kind contributions from participant organisations
- 29 participant organisations
- 7 years
- End-user driven research to deliver high impact and deployable alertness management technologies

Technology and Development End Users	
Industry and Employment End Users	
Policy, Regulatory and Insurance end Users	
Research, Education and Training	

Consortium

Broad range of technology developers

End users with high-risk operational settings

SMEs seeking capacity and relevance in an international market

Regulators seeking to drive research and enable change

Industry-based training

Commercialisation expertise and access to venture capital

Heavy Vehicle Driver Fatigue in Australia

- Regulation of heavy vehicle driver fatigue in Australia has been undergoing reform from the late 1990s.
- In 2000, the House of Representatives report *Beyond the Midnight Oil: an inquiry into managing fatigue in transport*, supported an overarching duty not to drive while impaired by fatigue and a more outcomes-based approach towards fatigue management.
- In 2008, Heavy Vehicle Driver Fatigue National Model Legislation implemented a three-tier approach to fatigue management which was replicated in the HVNL:

Standard hours

Basic Fatigue Management (BFM)
More flexible work and rest hours than drivers who work standard hours.
Must demonstrate that the risks of driver fatigue are properly managed.

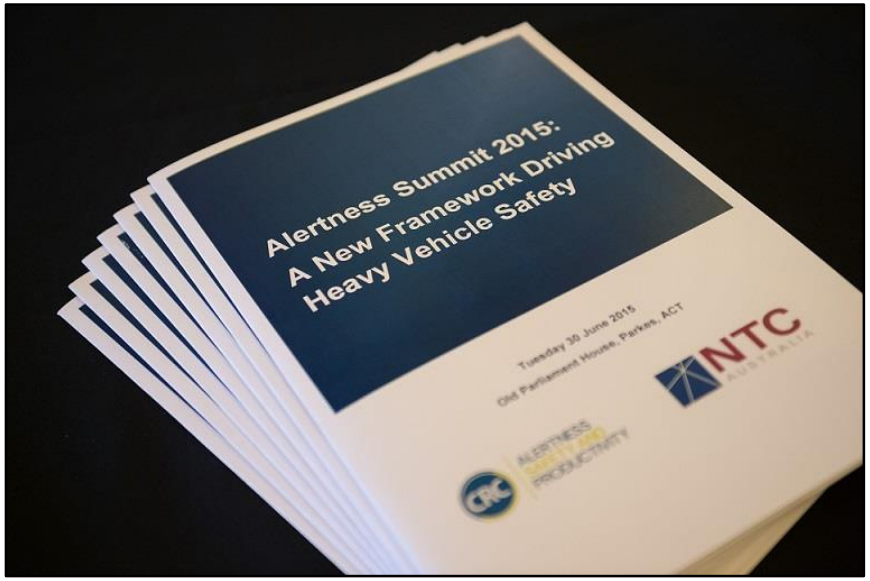
Advanced Fatigue Management (AFM)
Must demonstrate how the fatigue risks of schedules will be offset by sleep, rest and other management practices in a compliant fatigue management system.

Heavy Vehicle Driver Fatigue in Australia

- Heavy vehicles were involved in 182 fatal crashes in Australia in the year to June 2016 (*BITRE 2016*).
- The true impact of fatigue on these fatalities is unclear. An evidence base to support improvements in current fatigue regulations is lacking.
- Driver fatigue is a challenging area for policy makers given fatigue data collection is usually based on police enforcement data and collected by jurisdiction.
- Operational definitions, regulations and methods of recording and reporting fatigue data may differ between jurisdictions and organisations, leading to limitations in national, comprehensive analyses.
- Consistent and detailed data collection on driver alertness and fatigue risks, including scheduling, is needed to support improved policy-making in the Heavy Vehicle National Law.

Working towards a National Framework

May 2014	Transport and Infrastructure Council agreed the National Transport Commission (NTC) and National Heavy Vehicle Regulator should develop a national framework to collect operational data to inform broader fatigue policy, including the counting time rule
Nov 2014	Transport and Infrastructure Council approved the project; NTC to advise on recommendations for national data framework by end 2016
Dec 2014	NTC surveyed industry and governments to understand issues with current fatigue regulations and assess what data are currently collected
Mar 2015	NTC commissioned advice from fatigue experts on which issues associated with current fatigue regulations in the HVNL the framework should address, and what data should be collected to help inform and improve the assessment of fatigue risk for future policy decision-making
June 2015	NTC and Alertness CRC host national Alertness Summit


Alertness Summit 2015:
A New Framework Driving
Heavy Vehicle Safety
Tuesday 30 June 2015
Old Parliament House, Parkes, ACT
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Alertness Summit: June 2015

- Canberra, Australia.
- **Co-hosted** by the National Transport Commission and Alertness CRC.
- **Attendees:** scientists, alertness monitoring technology providers, police, road agencies, the National Heavy Vehicle Regulator, trade associations and heavy vehicle operators.
- **Aim**: Identify factors that contribute to increased fatigue risk, including feedback on what data are required to assess the effectiveness of current fatigue rules.
- **Discussion topics:**
  - improving crash investigation reporting
  - methods for capturing alertness and fatigue trends
  - guidelines for evaluating and implementing alertness monitoring technologies
  - factors contributing to heavy vehicle driver alertness and fatigue issues, including drowsiness associated with poor or disrupted sleep
  - current evidence gaps
  - initiatives to develop and assess the effectiveness of heavy vehicle driver fatigue policy

August 2015:
NTC Discussion Paper and consultation

Issues to be prioritised under the framework:

1	Nose-to-tail schedules
2	Quantity and quality of sleep attained in major rest breaks
3	Maximum continuous hours of work, particularly on Basic Fatigue Management (BFM)
4	Minimum rest times for BFM two-up drivers
5	Night time driving and ending shifts in the early morning
6	Impact of local work
7	Threshold application of fatigue laws and work diary record-keeping
8	Driver wellbeing and fitness to work

Heavy Vehicle Fatigue Data Framework

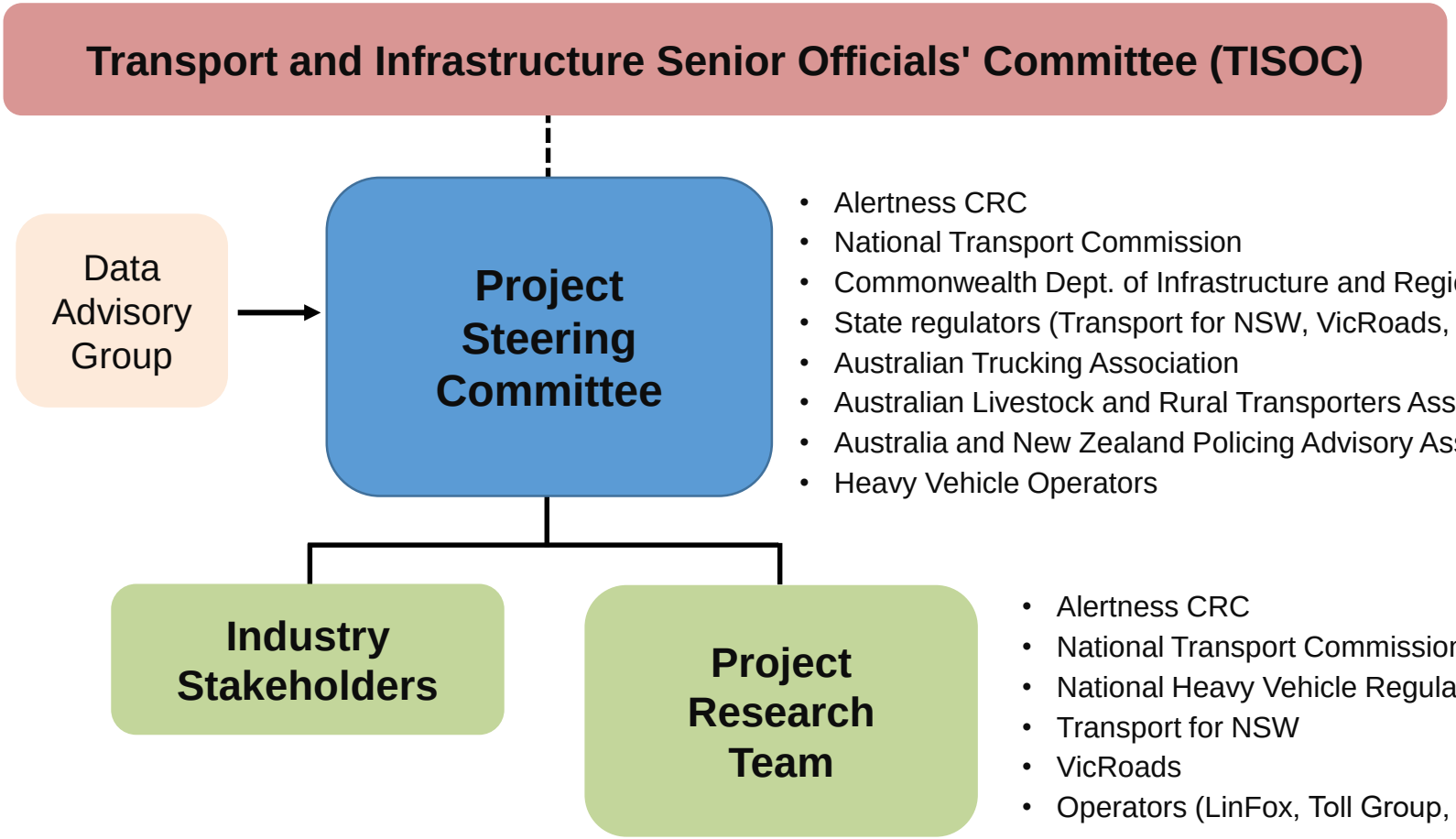
- Major collaborative initiative between the National Transport Commission, the National Heavy Vehicle Regulator, Alertness CRC, road agencies, police and industry.

- **Aim**: collect and analyse national heavy vehicle fatigue data to provide an evidence-base that supports any future reforms of the fatigue regulations in the Heavy Vehicle National Law to improve road safety risks.

- Formal research proposal by the Alertness CRC to conduct the key research tasks was approved with funding from the Australian government in December 2016.

- Part of broader data collection framework seeking how to harmonise state governments and police report and record fatigue and large-scale analysis of de-identified commercial data to identify patterns of fatigue in the context of regulated work and rest hours.

Project Management and Governance



- Alertness CRC
- National Transport Commission
- Commonwealth Dept. of Infrastructure and Regional Development
- State regulators (Transport for NSW, VicRoads, Victoria Police)
- Australian Trucking Association
- Australian Livestock and Rural Transporters Association
- Australia and New Zealand Policing Advisory Association
- Heavy Vehicle Operators

- Alertness CRC
- National Transport Commission
- National Heavy Vehicle Regulator
- Transport for NSW
- VicRoads
- Operators (LinFox, Toll Group, Nolan's Transport)

Project Objectives and Aims

Overall objective:

To evaluate the impact of Heavy Vehicle National Law fatigue regulations on road safety risks.

Achieved using two-phased project design:

Phase 1:

1a. Evidence-based selection of technology(ies) for field-based validation of driver alertness monitoring device/s in heavy vehicles.

1b. Identify relationships between alertness and operationally relevant safety risks in the field (i.e., fatigue related crash incidents, lane deviations, and/or near misses).

2. Assessment of heavy vehicle driver sleep quantity and quality in rest periods.

Phase 2:

Part A

1. Comparative analysis of the impact of nose-to-tail schedule and alternate schedule on heavy vehicle driver fatigue.

Part B

2. Assessment of heavy vehicle driver alertness measured against work schedules and objective alertness.

Phase 1 Approach

Design:

- A within subject, naturalistic field-based study.

Protocol:

- Participants will be monitored during days off and work shifts (day, evening and night) for individual alertness, driving impairments and sleep during a one month shift cycle.

Measures:

- Individual-level data will be collected on objective alertness assessments, driving impairment indicators, subjective alertness, neurocognitive performance, and sleep-wake monitoring.

Phase 2A Approach

Design:

- Experimental, mixed laboratory-field design (simulated) driving study.

Protocol:

- Participants randomised to one of two conditions: (i) the nose-to-tail schedule and (ii) an alternate schedule.

- Following one simulated shift, participants transferred to closed-loop driving track to complete a fully monitored drive in a dual control & instrumented vehicle.

Measures:

- Objective alertness assessments, driving impairment indicators, neurocognitive performance, and sleep-wake monitoring

Nose-to-Tail Schedules

- *Nose-to-tail* is the term used to describe the scheduling of two longer work periods in a 24-hour period, with a long rest period of at least seven hours between them.
- A driver can have up to four nose-to-tail combinations in an eight-day period.
- 2014 NTC report *Counting Time and Residual Fatigue Risk* summarised expert advice and the challenges of measuring fatigue impact of nose-to-tail schedules.
- Fatigue risk attributable to nose-to-tail schedules dependent on:
  - Insufficient sleep (minimum 7-hour major rest break between work periods)
  - Long work shifts (a single work opportunity is longer than 12 hours)
  - Circadian impacts (includes night work, sleeping during the day and starting early)
  - Frequency of nose-to-tail schedules (particularly consecutive schedules)
- Minister agreed there should not be policy changes until a framework is developed to collect real-life operational data to better inform fatigue policy.

Phase 2B Approach

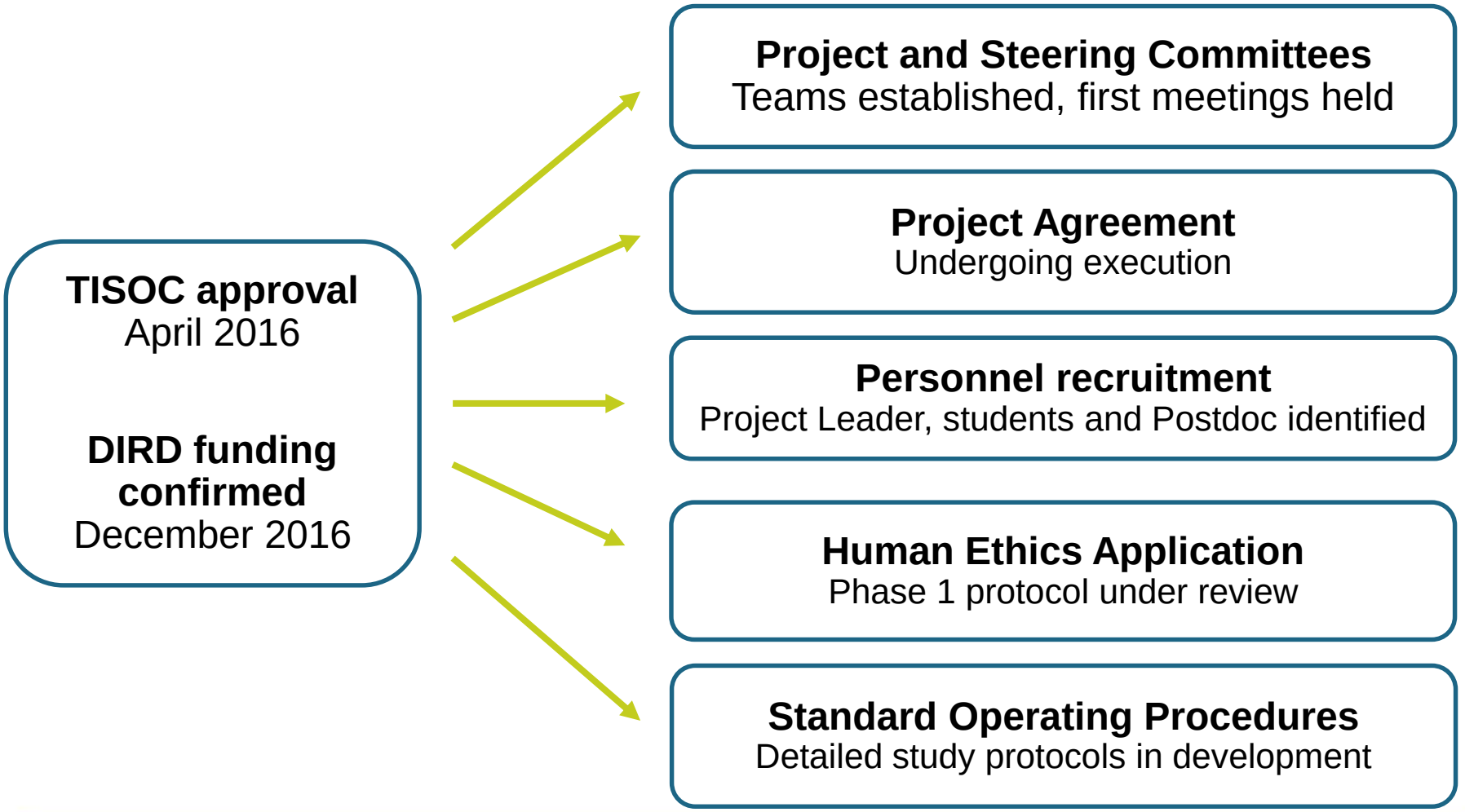
Design:

- Prospective naturalistic study

Protocol:

- Objective alertness data will be time & date stamped at an individual & group level and linked to corresponding work schedule data sourced from work diaries/log books and/or telematics data.

Current Progress of Project



Heavy Vehicle Driver Fatigue Project Teams

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IBAS
Institute for Breathing and Sleep

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- Maree Barnes

CRC ALERTNESS SAFETY AND PRODUCTIVITY

- Andrew Tucker

Steering Committee

- Commonwealth Dept. of Infrastructure and Regional Development
- Transport for NSW
- VicRoads
- Victoria Police
- Australian Trucking Association
- Australian Livestock and Rural Transporters Association
- Australia and New Zealand Policing Advisory Association
- Toll Group, LinFox, Nolan's Transport

Project Research Team

- National Heavy Vehicle Regulator
- Transport for NSW
- VicRoads
- Toll Group
- LinFox
- Nolan's Transport

Framework Structure/Operation