



Australian Government
Productivity Commission

National Transport Regulatory Reform

Productivity Commission
Inquiry Report

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The Productivity Commission

The Productivity Commission is the Australian Government's independent research and advisory body on a range of economic, social and environmental issues affecting the welfare of Australians. Its role, expressed most simply, is to help governments make better policies, in the long term interest of the Australian community.

The Commission's independence is underpinned by an Act of Parliament. Its processes and outputs are open to public scrutiny and are driven by concern for the wellbeing of the community as a whole.

Further information on the Productivity Commission can be obtained from the Commission's website (www.pc.gov.au).



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7 April 2020

The Hon Josh Frydenberg MP
Treasurer
Parliament House
CANBERRA ACT 2600

Dear Treasurer

In accordance with section 11 of the *Productivity Commission Act 1998*, we have pleasure in submitting to you the Commission's final report into *National Transport Regulatory Reform*.

Yours sincerely

Handwritten signature of Paul Lindwall.

Paul Lindwall
Presiding Commissioner

Handwritten signature of Ken Baxter.

Ken Baxter AM
Commissioner

Handwritten signature of Malcolm Roberts.

Malcolm Roberts
Commissioner

Terms of reference

I, Josh Frydenberg, Treasurer, pursuant to Parts 2 and 3 of the *Productivity Commission Act 1998*, hereby request that the Productivity Commission undertake an inquiry into national transport regulatory reform.

Background

Australian governments have been working collaboratively towards safer and more integrated national markets in transport arrangements for a number of years, with the aim of improved outcomes in freight and passenger transport markets.

In 2008-09, the Council of Australian Governments (COAG) agreed national transport reforms for heavy vehicles, rail safety, and domestic commercial vessels. Inter-Governmental Agreements (IGA) were agreed in 2011, specifying objectives for reform in each area. The IGAs provided for the establishment of national laws for each area, administered by newly established national regulators, the National Heavy Vehicle Regulator (NHVR), the Office of the National Rail Safety Regulator (ONRSR), and the National Marine Safety Regulator (NMSR). To help ensure that reforms progress as intended, COAG agreed in 2011 that the Productivity Commission would undertake an assessment of the economic benefits of reform once there had been progress with implementation.

Complementing earlier transport reforms, in July 2018, the Council of Australian Governments' Transport and Infrastructure Council agreed a framework for developing a 20-year national Freight and Supply Chain Strategy, which is being informed by the outcomes of the *Inquiry into National Freight and Supply Chain Priorities*.

Scope of the inquiry

The Productivity Commission is to investigate the long-run economic impacts of transport regulatory reforms agreed by COAG in 2008-09 relating to heavy vehicle safety and productivity, rail safety and maritime safety and to make recommendations for further reforms towards a more integrated national market for transport services.

In undertaking the inquiry, the Commission should examine:

1. the benefits accrued from each reform stream (heavy vehicle, rail safety and maritime safety). In assessing the economy-wide impacts, the Commission should consider:
 - (a) the benefits derived directly to the transport industry

-
- (b) the benefits derived for the community from consistent national safety regulation
 - (c) the benefits derived through the transport industry's role as an input to other industries
 - (d) the impact of cross border consistency for industry and governments
 - (e) relevant global or domestic changes impacting the transport economy since 2008
 - (f) the most important contributors to the benefits of transport reforms.
2. the implementation and development of the three national regulators (heavy vehicle, rail safety, and maritime safety), and the delivery against agreed objectives as set out in the IGAs and COAG priorities for transport. The Commission should also consider the capacity of local governments in supporting the implementation.
 3. opportunities for reform to further integrate and harmonise the regulation of the national freight market, and the current focus and remit of ONRSR, NMSR and NHVR.

The Commission should also take into account the broader reform objectives and goals identified in the COAG Communiqués of 2008-09 and associated intergovernmental agreements, as well as in relevant IGAs implemented since.

The Commission should have regard to work being undertaken by the Commonwealth, States and Territories on complementary reforms including (but not limited to) rail standards harmonisation and interoperability, improved network access for higher productivity vehicles and the development of the National Freight and Supply Chain Strategy.

In undertaking its analysis, the Commission should exclude reform measures being progressed separately, such as cost reflective heavy vehicle pricing, as far as is practicable.

Process

The Commission is to undertake an appropriate public consultation process including holding hearings, inviting public submissions and releasing a draft report to the public.

The Commission should complete the inquiry within 12 months of its commencement.

The Hon Josh Frydenberg MP

Treasurer

[Received 5 April 2019]

Acknowledgments

The Commission has used information from a range of sources in preparing this report. The Commission is grateful for the contributions made by individuals and organisations through their submissions, brief comments and their participation in meetings and hearings.

In particular, the Commission would like to acknowledge the National Heavy Vehicle Regulator, the Office of the National Rail Safety Regulator and the Australian Maritime Safety Authority. Each of these agencies provided the Commission with unpublished data that has formed an important part of the analysis for this report.

The Commission would also like to thank:

- Kellie Boland from Boland Transport and Marla Stone from Livestock & Rural Transporters Association of Victoria, who provided valuable insight to staff about how to engage with individual truck drivers
- the Bureau of Infrastructure, Transport and Regional Economics (BITRE), for its assistance in facilitating the Commission's request to State and Territory road safety authorities to gain access to, and get clearance to publish analysis using, the National Crash Database.

The Commissioners would like to thank the staff who worked on the inquiry. The team was led by John Salerian and included Stewart Turner, Hudan Nuch, Jeremy Nott, Lou Will, Rebecca Chin, Jabulani Bulle, Lindsay Fairhead, Tim Hewett, Max Gillespie, Joseph Moloney, Hans Zhu, Thithi Nguyentran and Caroline Nguyen-Kim, with administrative assistance from Yvette Goss.

The Coronavirus pandemic (COVID-19) is having major effects on the health and economic circumstances of Australians and will have short run implications for the regulation of transport. The Commission completed this inquiry report just as the virus pandemic took hold and the implications for national transport regulation are not considered in this report.

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Chart data: <https://www.pc.gov.au/inquiries/completed/transport/report>

Abbreviations

ADRs	Australian Design Rules
AMSA	Australian Maritime Safety Authority
BITRE	Bureau of Infrastructure, Transport and Regional Economics
CML	Concessional Mass Limits
COAG	Council of Australian Governments
CoR	Chain of Responsibility
DCV	Domestic Commercial Vessel
DITRDC	Department of Infrastructure, Transport, Regional Development and Communications
GDP	Gross Domestic Product
GML	General Mass Limits
GVM	Gross Vehicle Mass
HML	Higher Mass Limits
HVNL	Heavy Vehicle National Law
IAP	Intelligent Access Program
IGA	Intergovernmental agreement
MSNL	Marine Safety (Domestic Commercial Vessel) National Law
NHVAS	National Heavy Vehicle Accreditation Scheme
NHVIM	National Heavy Vehicle Inspection Manual
NHVR	National Heavy Vehicle Regulator
NTC	National Transport Commission
ONRSR	Office of the National Rail Safety Regulator
OSOM	Oversize Overmass
PBS	Performance-Based Standards
PC	Productivity Commission
RSNL	Rail Safety National Law
SLA	Service-level agreement
SPV	Special Purpose Vehicle
TCA	Transport Certification Australia
TIC	Transport and Infrastructure Council
WHS	Workplace health and safety

OVERVIEW

Key points

- COAG's harmonisation reforms established national laws and national regulators for heavy vehicles, rail, and domestic commercial vessels.
- After almost a decade, the transition is nearly complete, albeit with some unfinished business:
 - Western Australia and the Northern Territory do not participate in the national heavy vehicle regime
 - unnecessary derogations from the Heavy Vehicle National Law (HVNL) and Rail Safety National Law (RSNL) continue
 - some grandfathering provisions applying to domestic commercial vessels pose safety risks
 - approval processes for heavy vehicle access to local roads still lag in some areas.
- By most measures, heavy vehicle and rail safety continue to improve, largely due to new technology and infrastructure investments.
- Safety regulation across the three modes is a mix of prescriptive and outcomes-based regulation. Amending safety regulation to create a more flexible, outcomes-based approach should improve safety and lift productivity.
- The COAG reforms were expected to unlock large efficiency gains for heavy vehicle operators. While gains have been made, the forecasts were optimistic and have not been achieved.
 - Road access for larger, more efficient trucks has improved, but significant bottlenecks remain on some major freight corridors.
- There are significant opportunities for COAG, regulators and industry to further promote safety and productivity.
 - *Striking a balance between prescription and outcomes-based approaches in safety regulation:*
 - ... amending the HVNL to allow further progress to a tiered system, where operators can choose to follow prescriptive regulation or to develop more flexible and efficient ways to manage safety risks with the regulator's approval
 - ... removing unnecessary prescriptive detail from the HVNL.
 - *Emphasising risk-based approaches to improving safety and consistency:*
 - ... removing unjustified derogations (road and rail) and grandfathering (maritime)
 - ... ensuring effective oversight of Hire and Drive vessels in the maritime sector
 - ... streamlining Australian Design Rule processes for heavy vehicles.
 - *Improving infrastructure provision and management:*
 - ... progressing Heavy Vehicle Road Reform
 - ... ensuring that investment decisions on major freight corridors are based on transparent cost-benefit analysis, which includes consideration of intermodal options
 - ... encouraging more 'as-of-right' access for vehicles (where appropriate) and more efficient processes for assessing permit applications
 - ... creating more consistent network rules for rail services.
 - *Improving the evidence base for policy and regulatory decisions:*
 - ... establishing 'no-blame' incident investigation across the transport modes
 - ... harnessing telematics data to inform infrastructure investment and access management
 - ... ensuring that regulators improve their collection, analysis, and reporting of data, particularly in relation to safety outcomes and compliance costs.

Overview

What is this inquiry about?

The movement of goods, passengers and raw materials accounted for 4.5 per cent of Australia's GDP in 2018-19. The freight supply chain connects virtually all sectors of the economy, facilitating trade, production, and consumption. Both the freight task and passenger travel are expected to grow as the size of the population increases over time.

Transport activities involve inherent risks to safety. Governments have a role in encouraging and informing safe practices as well as ensuring that safety standards are not compromised by commercial pressures. At the same time, regulation should achieve safety objectives while minimising compliance costs and barriers to innovation, the latter being key to productivity growth and improved living standards.

The Australian Government asked the Commission to examine the impact of recent reforms to transport safety regulation which were intended to create more efficient national regulation (box 1). The Commission has also examined what further reforms might lead to a safer and more productive transport sector.

Box 1 **The Commission's task**

The terms of reference set two tasks for the Commission. The first is to assess the implementation and economic impact of the 2009 COAG reforms that established national safety regulation for heavy vehicles, rail, and domestic commercial vessels. The second task is to identify new reforms that could advance the objectives of the 2009 COAG reforms.

The Commission was asked to take account of the broader objectives of the 2009 COAG reforms, other associated intergovernmental agreements, and complementary reforms at the Commonwealth, State and Territory levels. These reforms include (but are not limited to) rail standards harmonisation and interoperability, improved network access for higher productivity vehicles, the National Freight and Supply Chain Strategy, and the broader Heavy Vehicle Road Reform agenda of the Transport and Infrastructure Council (TIC).

A safe and productive transport sector

Transport safety outcomes are determined by many factors, including the actions of transport workers, the decisions of transport operators, the functioning of the supply chain, the behaviours of people outside the transport industry (including the general public), the state

of equipment, and the adequacy of infrastructure. As such, there are several ways in which policy and regulation can influence transport safety (figure 1).

Figure 1 Policy objectives and levers to improve safety outcomes



It is important to set a regulatory approach suited to the structure of the industry and the nature of its safety risks. Striking the right balance between prescription and flexibility can not only help to minimise compliance costs without diminishing safety, but also potentially improve the management of safety risks overall.

A prescriptive (‘black letter law’) approach requires regulators and lawmakers to identify risks and mandate specific solutions, with industry expected simply to comply. This approach tends to work better in cases where risks are static and well-understood, with clear and practical solutions. It works less well where risks are complex and unpredictable; in these cases, it may be more effective to use an outcomes-based approach that incorporates measures such as general safety duties, accreditation, and approved safety management systems (box 2).

Box 2 **Different approaches to safety regulation**

Prescriptive approaches to regulation impose specific requirements on the operations of regulated parties. An example in heavy vehicle safety is regulations that prescribe the maximum mass of various types of heavy vehicles, with penalties for operating over the prescribed mass.

An **outcomes-based approach** to regulation involves defining the outcome the regulator is seeking to achieve without specifying the measures that regulated parties must take to achieve them. Outcomes are defined at a high level and in a way that lets regulated parties choose how to meet the objective. One way for regulated parties to demonstrate compliance with regulatory objectives is by becoming accredited. To maintain confidence in accreditation systems, regulators also monitor their effects on safety outcomes.

A **tiered system** can be useful in regulating a diverse group of operators. Under this arrangement, operators are subject to safety obligations and can choose how to achieve them.

- Regulators would publish ‘acceptable means of compliance’ — work practices and technologies that are deemed to achieve the high-level safety objectives.
- Transport operators could choose to not use the ‘acceptable means of compliance’ if they were able to demonstrate that they have systems for managing safety risks that are at least as safe as the acceptable means. Operators would be required to have their safety management systems accredited by the relevant regulator (at the operator’s expense).

In addition, **risk-based approaches** to safety regulation ensure that the nature and severity of compliance and enforcement are commensurate with the risks posed to regulatory objectives. Such approaches allow regulators to deploy resources in proportion to levels of risk, and to ensure that regulated businesses face compliance requirements commensurate with risk.

In practice, there are advantages and disadvantages to each regulatory approach. For example, well-designed prescriptive regulations can be simpler and less costly to enforce; rely less on regulator discretion; provide a mechanism to achieve regulatory harmonisation; and provide equivalent responsibilities for competing businesses. However, prescription deters innovation, as businesses lack the flexibility to manage their risks in more efficient ways. Prescription can also create a sense that businesses are primarily responsible for complying with regulation, rather than for managing safety risks to the best of their ability.

The Commission considers that approaches to safety regulation should take account of which party is best placed to understand and manage the safety risk. Doing so will usually require a mix of prescription and flexibility, in order to address a range of safety risks and to suit businesses of different sizes and capabilities. In some industries, a tiered approach is used to allow businesses a choice between following prescribed rules or using an alternative

approach with the regulator's approval. In any case, any regime of safety regulation that minimises compliance costs and facilitates innovation from industry can contribute to better safety outcomes and productivity growth.

In this context, the Commission has considered both the **harmonisation of transport safety regulation**, and the potential for **further policy action to improve safety and productivity**. Establishing national regimes was intended to improve the efficiency of safety regulation, with positive implications for both productivity and safety. However, by focusing on safety regulation (and to some extent, heavy vehicle access), these reforms excluded other important levers for government. Notwithstanding the benefits achieved through harmonisation, several bottlenecks to productivity remain and further reform is warranted.

Harmonisation of transport safety regulation

The arguments for establishing national regulatory regimes in transport included that:

- transport services often traverse State and Territory borders, meaning that operators would often encounter multiple regulatory regimes in the course of a single journey
- businesses with operations in multiple jurisdictions had to duplicate compliance efforts
- national regimes could reduce costs for transport workers moving interstate, or for businesses moving fleet assets interstate.

In 2009, COAG endorsed a shift to national regulation of heavy vehicles, rail, and domestic commercial vessels (DCVs), leading to three intergovernmental agreements made in 2011. The reforms aimed to harmonise safety regulations across jurisdictions as part of the Seamless National Economy agenda.

The primary goals of the harmonisation agenda have been achieved, albeit with some implementation issues and unfinished business (figure 2). National laws have been implemented for each sector, including the Heavy Vehicle National Law (HVNL), the Rail Safety National Law (RSNL), and the Marine Safety (Domestic Commercial Vessel) National Law (MSNL). The three national laws replaced multiple State and Territory Acts. There remain two non-signatory jurisdictions to the HVNL (Western Australia and the Northern Territory) and many derogations from both the HVNL and RSNL.

National regulators have also been established. The National Heavy Vehicle Regulator (NHVR) and the Office of the National Rail Safety Regulator (ONRSR) were established in 2012. The Australian Maritime Safety Authority (AMSA) became the national regulator of domestic commercial vessels on 1 July 2013, and assumed responsibility for all related service delivery on 1 July 2018.

Figure 2 The progress of the 2009 COAG transport reforms

	Heavy vehicles	Rail	Maritime
Regulated industries	<ul style="list-style-type: none"> All heavy vehicles >4.5t Freight haulage Oversize, overmass Construction transport Passenger buses 	<ul style="list-style-type: none"> All above- and below-rail operations Freight rail Passenger rail 	<ul style="list-style-type: none"> DCVs - operating only within Australian waters Passenger Fishing Hire and drive Other DCVs
Establishment of national regimes	<ul style="list-style-type: none"> Heavy Vehicle National Law National Heavy Vehicle Regulator 	<ul style="list-style-type: none"> Rail Safety National Law Office of the National Rail Safety Regulator 	<ul style="list-style-type: none"> Marine Safety (Domestic Commercial Vessel) National Law Australian Maritime Safety Authority
	<ul style="list-style-type: none"> Replaced six State and Territory Acts Replaced six regulatory authorities 	<ul style="list-style-type: none"> Replaced seven State and Territory Acts Replaced seven regulatory authorities 	<ul style="list-style-type: none"> Replaced eight Commonwealth, State, and Territory Acts Replaced seven regulatory authorities
Implementation issues	<ul style="list-style-type: none"> Delays to application of National Laws Delays to regulator maturity and operation 	<ul style="list-style-type: none"> Relatively smooth transition 	<ul style="list-style-type: none"> Changes to AMSA's role, starting dates Uncertainty over cost recovery Delayed, inconsistent handover from jurisdictions
Extent of implementation at 2019	<ul style="list-style-type: none"> Two non-signatory jurisdictions (WA, NT) Several substantive derogations NHVR yet to assume full responsibility across NSW, QLD. 	<ul style="list-style-type: none"> Several substantive derogations Inconsistencies due to mirror legislation Above rail operators face varying track rules 	<ul style="list-style-type: none"> Many DCVs not subject to aspects of MSNL due to grandfathering Regulator's data capabilities still building Cost recovery to be resolved in 2021

The scale of the harmonisation task for each of the three modes of transport has been considerable, partly due to the wide variations between State and Territory regulations. Implementing the national laws and establishing national regulators has taken longer than expected, and remains a work in progress. These experiences have yielded several lessons that could be relevant to undertaking harmonisation reforms in other sectors (box 3).

Box 3 **Lessons learned about harmonisation**

Lessons learned from the implementation of national transport regulation could usefully inform other policy initiatives where harmonisation is intended.

Harmonisation is a means not an end

Harmonisation should only be pursued with due regard to benefits and costs. The costs of implementation alone may be significant. Moreover, regulatory inconsistencies across jurisdictions could be justified (for example, they may reflect different operating environments). Any process of harmonisation should be an evidence-based move toward best practice regulation.

Where consistency of regulation is pursued, governments should consider different ways of achieving it, including uniform legislation, mutual recognition or less prescriptive regulation. Any derogations from national law should either be justified by evidence or removed.

Preparation and planning are key

A smooth transition to national regulation requires careful planning and a shared commitment from all participating jurisdictions. Cooperation from exiting regulators is essential. These regulators have few incentives to maintain their regulatory activities or to assist the new regulator in obtaining the personnel, systems and data for a successful launch. The problem is compounded if the national regulator faces widely different State and Territory regimes with little shared agreement on the detail of future (national) legislation. A strong commitment by all jurisdictions, that is clearly articulated to their agencies, is most likely to ensure a smooth transition.

National regulation requires consistent national data

Risk-based regulation requires high quality information to guide decision-making. Switching to national regulation is likely to require consolidating different State and Territory datasets into a single system. In cases where jurisdictions collect and use data in different ways, creating a new system is likely to be challenging. Data should be shared with the national regulator as early as possible before the commencement date of the new regime.

Funding for the regulator should be agreed at the outset

Prolonged uncertainty over funding can limit a regulator's ability to provide services in the short term or to plan service levels in the longer term. This has been the case in domestic commercial vessel regulation, where the approach to cost recovery will not be determined until 2021 — eight years after the establishment of the MSNL. Barriers to service delivery or forward planning will have implications for the effectiveness of the regulator, and therefore, for safety outcomes.

Transitional measures should be clearly time-limited

Grandfathering allows businesses to continue operating under old regulations rather than current regulations. Grandfathering can help some operators during the transition to a new regime, but indefinite grandfathering delays the adoption of safer practices and technologies. Grandfathering provisions should be subject to reasonable sunset provisions, after which time they should be reviewed using an independent cost-benefit analysis. Similarly, while Service Level Agreements with state regulators are useful in the transition to a national regime, long-term reliance on third parties can delay national regulators reaching maturity.

(continued next page)

Box 3 (continued)

An applied laws approach aids harmonisation

There are two main ways for States and Territories to legislate a national law. Jurisdictions may give effect to a law from a host jurisdiction (applied legislation) or a jurisdiction may produce its own Act duplicating the provisions of the other Act (mirror legislation). An applied laws approach ensures that the national law changes in all participating jurisdictions once legislation is passed in the host parliament. However, with mirror legislation, changes to the national law are not automatically reflected in 'mirror' jurisdictions. Rather, each jurisdiction can decide whether or not to amend its Act in line with national law, and legislation will need to be passed in its parliament. Mirror legislation can cause lags and inconsistencies which can last for years.

The effect of harmonisation reforms on safety

The move to national laws and regulators has fundamentally changed how transport safety is regulated. It has allowed for improvements to the management of safety risks, including the further development and proliferation of chain of responsibility laws, fatigue management, and accreditation (heavy vehicle); the establishment of a functional system of co-regulation (rail); improvements in interface agreements (rail); and improvements in safety equipment standards (maritime).

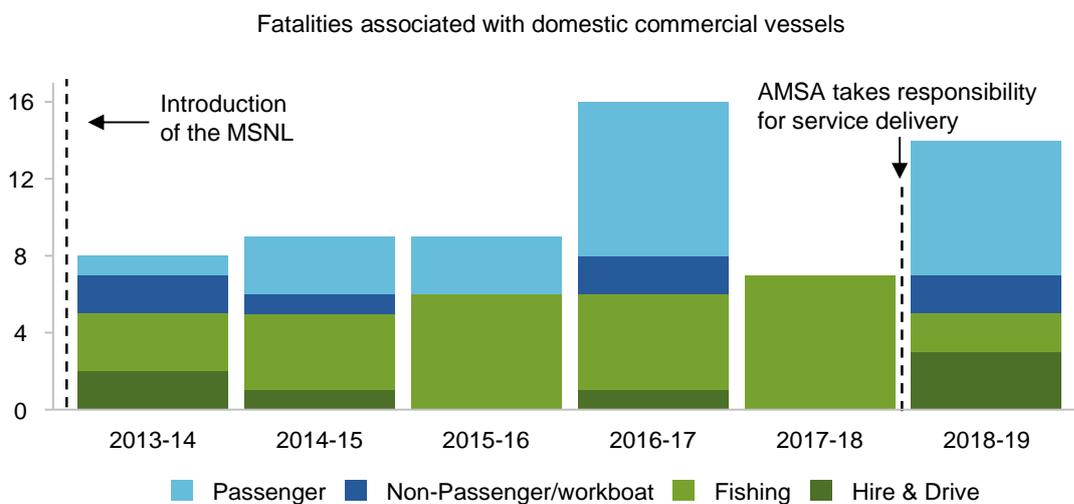
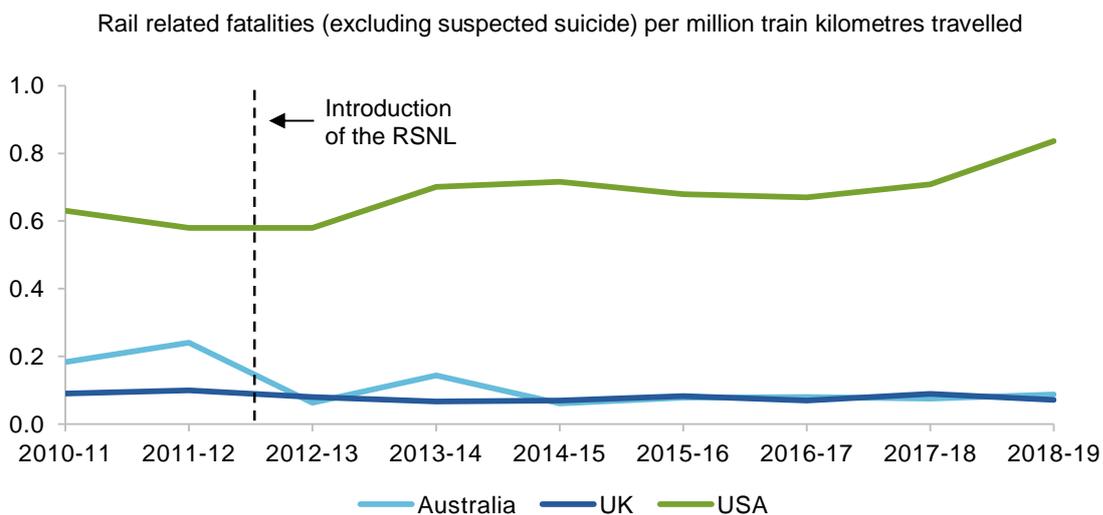
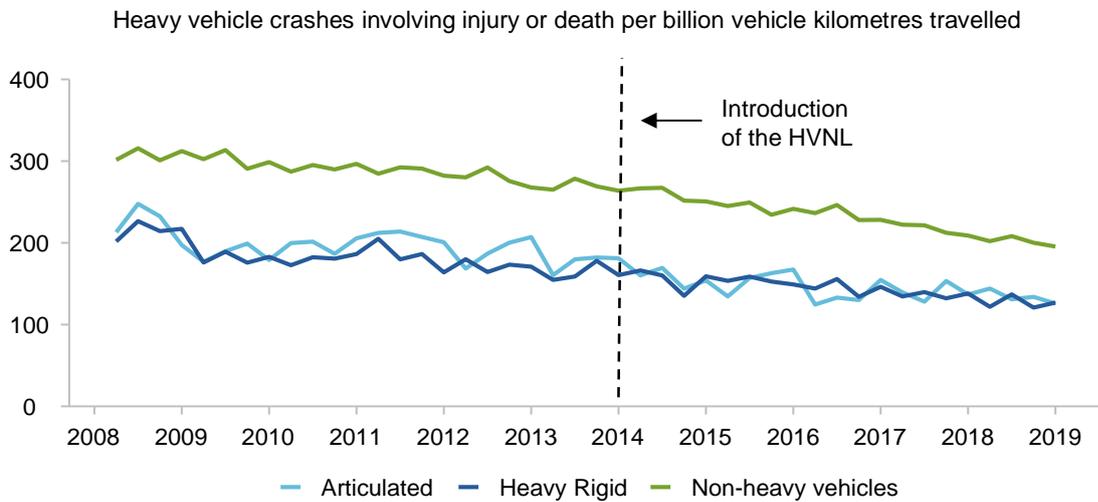
It is less clear whether national regulation has led to better safety in the transport sector. By most measures, safety has continued to improve since 2011 (figure 3). However, it has not been possible to separate the effect of the national laws from other factors such as the introduction of safer technology or improvements in infrastructure. Some policy changes are expected to contribute to longer term improvements in risk management; their benefits might not yet be apparent but could emerge over time.

The effect of harmonisation reforms on productivity

On the limited information available, it is unclear whether compliance costs have increased or decreased overall as a result of the harmonisation reforms. Compliance costs appear to have decreased for some operators, particularly in rail. In addition, it is difficult to assess whether the establishment of national regulators has led to a reduction in administrative costs, due to a lack of comparable data from before and after the reforms.

Most of the productivity benefits of harmonisation were expected to come from improved road access for heavy vehicles. The Regulation Impact Statement for the Heavy Vehicle National Law estimated the value of improved heavy vehicle access at \$9 billion over 20 years in net present value terms. This estimate of productivity growth was excessively optimistic and could not have been achieved even if implementation had been ideal.

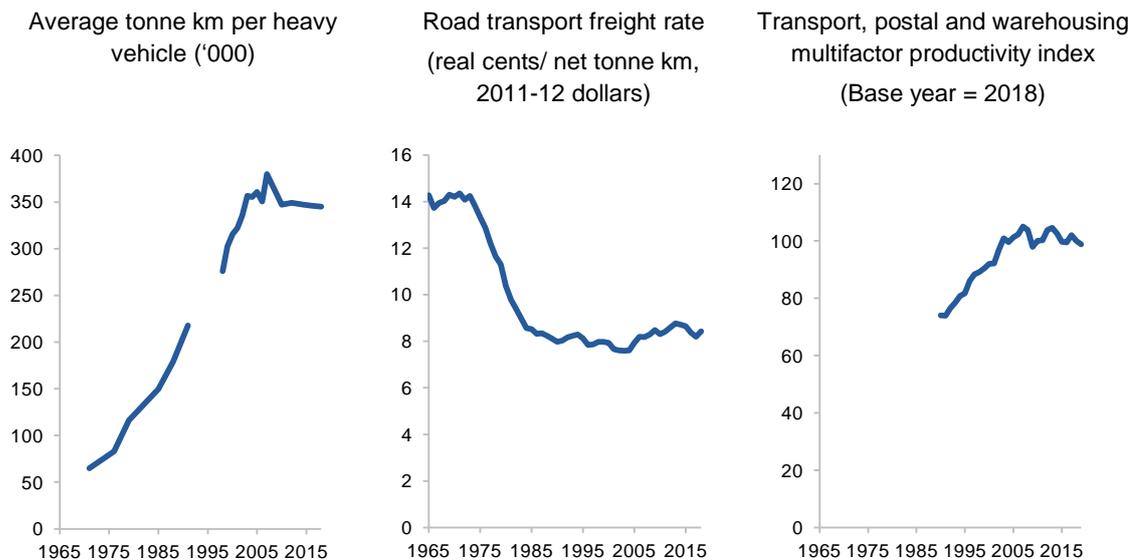
Figure 3 Transport safety over time



Some road managers have made progress in improving heavy vehicle access by using gazetted as-of-right access, as well as permit pre-approvals that allow access without referral to asset managers. This has led some heavy vehicle operators to invest in larger (and safer) vehicles. However, there have been few changes in access on key freight routes and the increase in the number of more productive vehicles is small relative to the size of the whole truck fleet.

Overall, the changes appear to have had a limited effect on heavy vehicle performance. Several indicators suggest sluggish productivity growth in road transport over the past decade (figure 4). Long term historical trends show the amount of freight carried per heavy vehicle has increased while freight prices have decreased; however, these trends have both plateaued in recent years. The timing of these trends is consistent with the plateau in multifactor productivity (MFP) in the transport, postal and warehousing sector.

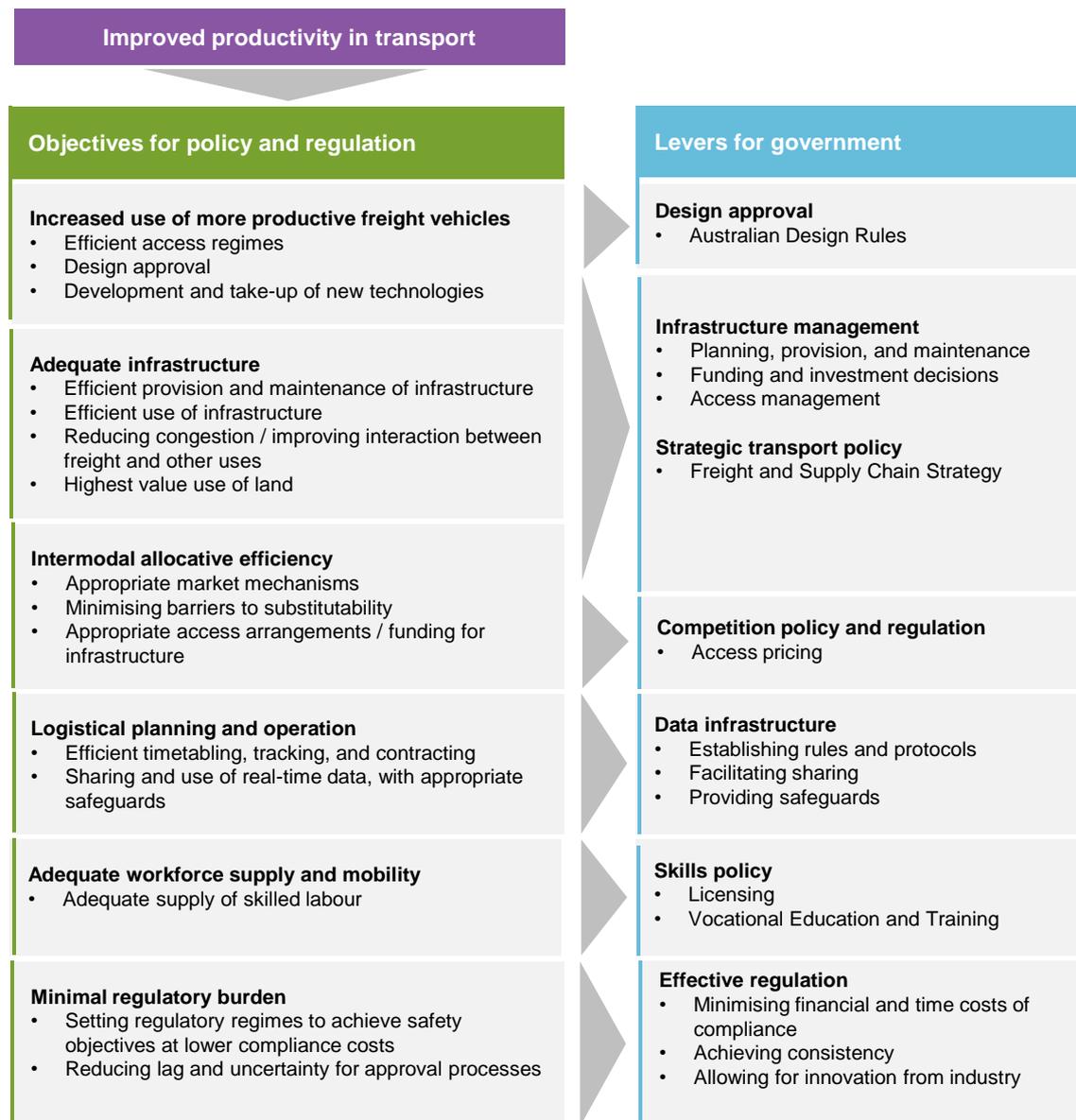
Figure 4 National heavy vehicle performance



Productivity bottlenecks remain

Productivity in the transport sector is influenced by many factors, including technological change, innovation, competition, the design of regulation, and the behaviour of regulators (figure 5). There remain significant bottlenecks to further productivity growth in the transport sector, due to both unfinished aspects of the 2009 COAG reforms and issues beyond the remit of those reforms. Some of these issues occur on major corridors, such as the Hume Highway between Melbourne and Sydney, where operators continue to face inconsistent access when crossing state borders and are limited in their ability to implement productivity-enhancing technology (box 4).

Figure 5 Policy objectives and levers to improve productivity



More generally, the challenge remains for government to maximise the innovative potential of private industry, while meeting objectives around safety and efficient infrastructure management. In some cases, lifting productivity growth will require a redesign of safety regulation, allowing for greater use of outcomes-based and risk-based regulation, as well as greater scope for private sector innovation. In other cases, governments will need to introduce reforms to related policy areas.

Box 4 Case study: larger freight vehicles on the Hume Highway

While the B-double is a workhorse among heavy freight vehicles, some larger combinations (such as A-doubles and B-triples, particularly Performance-Based Standards (PBS) combinations) are more efficient, more versatile, and potentially safer. These larger combinations carry more freight in a single trip, meaning that fewer trips are required for a given freight task. As an example, the amount of freight transported in 100 vehicle movements of a 26 m B-double would only take about 80 vehicle movements using a 36.5 m A-double. In addition, A-doubles are easily separated into two standard semitrailers, increasing flexibility for operators. Where roads can accommodate these larger vehicles, allowing access to them can lead to lower operating costs and improve productivity.

The benefits of opening access to A-doubles are particularly relevant on major freight corridors, such as the Hume Highway between Sydney and Melbourne. In 2018, Victoria introduced pre-approved access networks to accommodate 30 m PBS A-doubles, including on the Hume Highway. The change aimed to improve freight efficiency in response to frustration voiced by industry. However, access for A-doubles and other larger vehicles does not extend to New South Wales, and remains relatively limited on this corridor in both Victoria and New South Wales. The lack of end-to-end access for larger vehicles lowers the incentive for operators on this corridor to invest in these vehicles. Improving access to the Hume Highway for larger vehicles, especially PBS vehicles, would encourage their use and reduce the number of heavy vehicle movements and associated safety risks.

While the focus of the 2009 COAG reforms was to minimise compliance costs and barriers to innovation through safety regulation, other key levers for governments include the efficient investment in and management of transport infrastructure, design approvals, and data infrastructure. And while the national safety regulators are important partners in improving productivity, much of the required action will need to come from the three levels of government. As such, it is unlikely that large productivity benefits will be realised in the absence of broader reforms, as outlined below.

Further policy action to improve safety and productivity

Changes to several areas of policy could lead to substantial improvements to transport safety and productivity, many of which are beyond the scope of safety regulation. Governments should:

1. balance prescription and outcomes-based approaches in safety regulation
2. take a risk-based approach to safety, compliance and enforcement
3. improve infrastructure provision and management
4. improve the evidence base for regulatory and policy decisions.

1. Balance prescription and outcomes-based approaches in safety regulation

<i>Reform</i>	<i>Responsibility</i>	<i>Objective</i>
Allow for more outcomes-based regulation of heavy vehicles. Reform the HVNL to allow the regulator sufficient discretion and powers in legislation to implement a tiered approach to regulation.	Australian, State and Territory Governments, and safety regulators.	Allow more capable firms to innovate in how safety is managed (with approval from the regulator). Businesses not seeking flexibility can operate according to prescriptive regulations.
Remove detail from the HVNL and provide 'acceptable means of compliance' in other instruments.	Australian, State and Territory Governments.	Improve the efficiency of prescriptive heavy vehicle regulations through streamlining and making them more adaptable to change.

Transport businesses vary in size, resources, and capabilities, particularly in the heavy vehicle and domestic commercial vessel industries. Given this diversity, there is value in a tiered approach to transport safety regulation, involving acceptable means of compliance (offering certainty and ease of compliance) complemented by the option of flexibility (with approval from the regulator for in-house management systems or accredited off-the-shelf solutions). This would allow operators to either follow a clear, 'deemed to comply' set of regulations, or opt into a system that allows flexibility to meet acceptable safety outcomes in more efficient ways.

This regulatory model is most advanced in rail. ONRSR can approve safety management systems proposed by operators and can implement more direct regulation where they see fit. There is likely to be value in ensuring that similar outcomes-based regulation is available for operators in other modes of transport, to operate alongside prescriptive 'deemed to comply' provisions.

Further progress toward a tiered system is warranted in heavy vehicle regulation. The National Transport Commission (NTC) noted in its issues paper on *A risk-based approach to regulating heavy vehicles* that the HVNL forces operators to implement safety management systems while remaining in a prescriptive regulatory environment. For example, some large operators may already use safety assurance frameworks (in order to comply with Workplace Health and Safety laws or other regulatory regimes) but remain subject to the prescription of the HVNL.

The HVNL already allows some scope for flexibility beyond the 'black letter law', similar to the broad design of the tiered system discussed above. For example, the National Heavy Vehicle Accreditation System (NHVAS) allows operators regulatory concessions on specific modules such as fatigue management and vehicle maintenance. However, the NTC's review of the HVNL is a timely opportunity to consider how to redesign regulation in the sector, beyond simply adjusting existing mechanisms.

The HVNL should be amended to further progress heavy vehicle regulation toward a tiered system. The system would need to reflect the varied preferences and capabilities of

operators: some may prefer a clear set of prescriptive regulations; some may prefer limited flexibility; and others are likely to benefit from implementing their own safety management systems.

Under a tiered system, the NHVR would need to be satisfied that any alternative approach to managing a safety risk would provide safety outcomes at least equivalent to those expected under prescriptive regulations. This would require legislation to provide the NHVR with sufficient discretion, frameworks for public accountability, and clear roles and responsibilities. The latter should include frameworks for assurance decision-making, and responsibilities for monitoring, compliance, and enforcement.

In general, tiered and outcomes-based systems require highly capable regulators. Strong capabilities would be required of the NHVR, including proficiencies in assessment, assurance, monitoring, and enforcement. In relation to the latter, a clear understanding of the tiered approach would be required by all parties responsible for enforcement, including the Australian, State and Territory Police Forces.

Changes should also be made to ensure that the prescriptive tier of the HVNL operates efficiently. At present, any update to the HVNL to reflect contemporary evidence would require legislative change. The Commission has heard from industry that aspects of weight restrictions and vehicle definitions entrenched in the HVNL discourage the use of safer technologies, such as twin-steer prime movers. If prescriptive detail were removed from legislation and placed in other regulatory instruments, this would allow regulations to be updated more promptly, ensuring that the HVNL is not subject to inertia.

2. Take a risk-based approach to safety, compliance and enforcement

<i>Reform</i>	<i>Responsibility</i>	<i>Objective</i>
Remove derogations from the national laws where they are not justified on safety grounds by evidence.	Australian, State and Territory Governments, and safety regulators.	Ensure that regulations reflect current evidence and are adaptable to change.
Phased removal of grandfathering with respect to maritime survey and smoke detection systems.	AMSA with support from Australian, State, and Territory Governments.	Make vessels subject to survey according to risk profiles, rather than date of operation. Better knowledge of the fleet would inform further changes. Smoke detection systems could address safety risks with minimal compliance cost to industry.
Return responsibility for regulating Class 4 vessels to State and Territory Governments.	Australian, State, and Territory Governments, and AMSA.	Ensure that Hire and Drive vessels are regulated efficiently with appropriate and cost-effective enforcement.
Further streamline Australian Design Rules, treating advanced international standards as 'deemed to comply' unless deeper investigation is required.	Australian Government.	Reduce processing times for new technologies where advanced international standards exist, and Australian needs and conditions are unlikely to be unique.

Safety regulators should continue to pursue risk-based approaches to safety regulation, particularly in compliance and enforcement. Such approaches allow regulators to deploy resources in proportion to the risk of harm. Regulators can then tailor their service delivery and administration so that compliance costs are commensurate with risks. However, regulators' assessments of risk should be underpinned by thorough analysis of evidence.

The capacity for regulators to implement risk-based regulation is, in some cases, hampered by derogations from the national laws. State and Territory Governments should remove derogations that result in additional compliance costs which cannot be justified on the basis of safety, and where any cost of removing the derogation is commensurate with the expected safety benefit. National regulations should also reflect the risks in different operating environments. As a priority, State and Territory Governments should consider moving to harmonised regulation of fatigue management in rail, particularly for interstate transport. Consistent approaches to fatigue management would reduce compliance costs and would not diminish safety.

In maritime regulation, while elements of risk-based regulation have been implemented, several areas of regulation are subject to grandfathering provisions. The safety risks associated with grandfathering have been acknowledged by various stakeholders, including AMSA. State and Territory coroners have recommended the removal of grandfathering for domestic commercial vessels, especially fishing vessels. However, establishing a conclusive case for removing each remaining grandfathering provision is difficult, given the dearth of evidence on the likely costs to industry and expected safety benefits that might result.

As a starting point, governments should support AMSA in removing grandfathering of survey requirements. Requiring grandfathered vessels to undergo survey would enhance AMSA's evidence base and ability to target regulation and enforcement according to risk. In time, AMSA should have a sufficient evidence base to conclude whether further changes to grandfathering provisions would have safety benefits commensurate with compliance costs. Where a convincing case is made on safety grounds, governments should support AMSA's decisions around grandfathering provisions.

The split of responsibilities between AMSA and State and Territory regulators can be improved. Recreational craft are regulated by AMSA if hired, and by a State/Territory regulator if used for non-commercial purposes. This division of responsibilities lacks a sound rationale. State and Territory regulators are responsible for safety on local waterways and are resourced for the task. Returning responsibility for Hire and Drive (Class 4) vessels to the States and Territories would allow for clear enforcement and avoid the need for AMSA to duplicate existing services. Should governments be reluctant to make this change, AMSA should coordinate with State and Territory agencies to enforce safety regulation of Class 4 vessels, although that approach would be less efficient than transferring responsibility back to the States and Territories.

In some cases, risk-based regulation will require regulators to mandate protocols or equipment where risks are high relative to the prospective compliance cost. For example,

AMSA already requires vessels to carry Emergency Position-Indicating Radio Beacons (EPIRBs), and should also require passenger vessels to be fitted with smoke detectors.

In other cases, better regulation of safety risks could result in less intrusive regulation. For example, new technologies, particularly in heavy vehicles, may have a high exposure to risk and require stringent enforcement of standards. However, standards are also implemented by the advanced economies from which Australia imports most of its heavy vehicles. For the most part, those standards are accepted through the Australian Design Rules, with some adaptation to Australian conditions. There would be value in ensuring that international standards from advanced economies are treated as ‘deemed to comply’, unless the relevant Department considers that a review is required (which should then be completed within a defined timeframe).

3. Improve infrastructure provision and management

<i>Reform</i>	<i>Responsibility</i>	<i>Objective</i>
Continue to implement Heavy Vehicle Road Reform.	All levels of government.	Provide a mechanism to better link road demand and supply. Allow for efficient and adequate funding of road provision and maintenance.
Consider intermodal opportunities when planning investment on major transport corridors.	Australian, State and Territory Governments.	For major freight routes, allow for a more efficient allocation of infrastructure investment funding through transparent cost-benefit analysis.
Improve the capabilities and resourcing of road asset managers. Encourage more as-of-right access. Negotiate more flexible permit pre-approvals to encourage risk-based access decisions. Publish information on access permit decisions and processing times.	State, Territory, and Local Governments; NHVR.	Improve the efficiency of the heavy vehicle access system, thereby improving the management and use of infrastructure.

Safety and productivity in the heavy vehicle and rail sectors require policies that support efficient investment in, and management of, infrastructure.

Valuable work is underway to understand how pricing for heavy vehicle charges might work in practice. Public consultations have been held on the prospect of independent price regulation of heavy vehicle charges. There have been multiple reports into Heavy Vehicle Road Reform and price-setting models. Governments at all levels should ensure that these reforms continue as a matter of priority.

It could also be valuable to reconsider how major infrastructure investment decisions are made on important transport corridors. While road and rail transport are mostly complementary, the two modes may also compete on these corridors to deliver long-distance freight. Government investment in new infrastructure should be technology- and

mode-neutral, and subject to transparent lifetime cost-benefit analysis. Investment should be allocated to projects that have the highest probability of significant net benefits (noting historically common tendencies to overestimate net benefits and to take insufficient account of uncertainty). As the Commission has noted elsewhere, project analysis and decision making should be independent of project proponents.

Significant, incremental improvement is also possible for road access management. Road asset managers allowing as-of-right access (including with conditions) reduces strains on the permit approval system and gives certainty to heavy vehicle operators. Each road asset manager should be sufficiently resourced to make prompt decisions about access — this could involve resource pooling, particularly for road managers who receive permit requests less frequently. The NHVR should also improve reporting and analysis of past access decisions to provide an evidence base for road managers and industry.

4. Improve the evidence base for regulatory and policy decisions

<i>Reform</i>	<i>Responsibility</i>	<i>Objective</i>
Improve the sharing and use of data to inform infrastructure management and access decisions.	Australian, State and Territory Governments.	Improve the evidence base for infrastructure asset managers, improving investment, maintenance, and access management decisions.
Establish and fund no-blame investigation for heavy vehicles and autonomous vehicles. Properly resource no-blame investigation in rail and DCV transport.	Australian, State and Territory Governments.	Ensure that no-blame incident investigation operates in each mode of transport and informs safety policy and regulation regarding systemic issues.
Improve the collection, analysis, and reporting of safety data.	AMSA, NHVR, and ONRSR.	Improve accountability of safety regulations and regulators.
Regulators to monitor and report on compliance costs.	AMSA, NHVR, and ONRSR.	Improve visibility and focus on compliance costs.
Regulators to report disaggregated administration costs.	AMSA, NHVR, and ONRSR.	Improve accountability to cost-recovery principles.

The National Freight Data Hub, announced by the Australian Government in the 2019-20 Budget, is in the early stages of design and development. While there are potentially many commercial and regulatory uses for freight data, some of the key opportunities involve providing infrastructure managers with improved information on how roads are being used by operators. This could better inform road asset planning and management, and assist in day-to-day road access decisions. These opportunities may benefit from the consolidation of data in a central repository and the development of protocols for the sharing and use of data. They could be among many significant contributions of the National Freight Data Hub.

At the same time, the national safety regulators should improve their collection, reporting, and analysis of operational data. For example, more detailed reporting by the NHVR of permit-related data would help businesses identify areas where permits have been granted in the past, as well as areas with longer processing times or higher refusal rates.

Regarding safety-related data, improving incident reporting and data publication would increase transparency and inform risk-based approaches to regulation and enforcement. Analysis of safety data could add significant value for industry through research and policy development. Among the three modes of transport that are the focus of this inquiry, maritime transport appears to be the least well served by public research agencies aside from the regulator itself. There would be value in having agencies other than AMSA conducting research into maritime safety.

In general, transport policy, regulation, and industry practice could all benefit from an improved understanding of the systematic causes of safety incidents. While investigations by law enforcement, coroners, and insurers identify direct technical causality and legal liability, more systematic and circumstantial factors are likely to fall outside of their focus. Understanding these factors requires not only incident investigation, but also historical analysis and extended research into the supply chain, the manufacturing chain, and various chains of responsibility. Systematic safety concerns will increase in importance as technology develops (particularly with autonomous transport, where systems themselves have agency), and as supply chains become more complex and integrated.

In both air and rail transport, independent no-blame investigation helps build understanding of the systemic causal factors of safety incidents. Similar models are used internationally to complement safety regulation, across all modes of transport. No-blame investigation allows for informed policy recommendations to be made independently of governments, and for advice to be provided to industry without asserting legal wrongdoing.

No-blame investigation in the rail sector is not consistently resourced; no such system operates for road transport or for domestic commercial vessels. Governments should ensure that independent investigation of systemic safety issues occurs across all modes of transport, including where autonomous vehicles, trains and vessels are involved. For each mode, there is value in taking a national approach. Stable funding is required to build expertise and to avoid the delays which would arise if funding has to be negotiated incident-by-incident. All governments should provide funding to support this critical public interest work.

A national approach to no-blame incident investigation and research should be centred around the Australian Transport Safety Bureau (ATSB), as this would allow leveraging of existing processes and expertise. Aside from resourcing, legislative change would also be required to provide the ATSB with a formal role in investigations and research involving domestic commercial vessels, and to allow the ATSB to undertake operations in road transport. The latter should include a clearly defined, phased transition into no-blame incident investigation and research for heavy vehicle transport (involving extensive data analysis and a relatively narrow set of incident investigations), and no-blame incident investigation of autonomous road vehicles.

Conclusion

The harmonisation of transport safety regulation was a practical, cooperative reform to improve safety and lower business costs. The implementation phase of these reforms is nearing completion, having already revealed important lessons for policymakers contemplating harmonisation in other sectors. The next wave of reforms in the transport sector will build on these foundations, but will also need to tackle a wider set of issues.

Further action is required from governments to fully realise the benefits of national systems of safety regulation. This includes enhancing the capability of regulators to apply a rigorous outcomes- and risk-based approach to safety regulation, and removing excessive prescription from regulation. Derogations and grandfathering provisions should also be phased out, subject to evidence-based justification on safety grounds.

Governments should also aim to improve infrastructure planning, investment, and pricing. This includes improving the ability of infrastructure managers to undertake tasks relating to planning, maintenance and access management. It also includes continuing to establish stronger links between the supply and demand of road infrastructure, and committing to thorough and transparent cost-benefit analysis that considers the intermodal nature of freight.

For industry, the next wave of reforms should enable the adoption of innovative, safe solutions. It should also reduce the barriers to the use of safer and more efficient technologies, and encourage the production, sharing, and use of data.

Continued improvement in regulation and policy will require ongoing commitments from governments: driving the national reform agenda; ensuring efficient levels of resourcing; and committing to transparent, evidence-based decision making. Together this package of reform measures could produce a transport sector that is safer, more efficient, and better prepared for the growing passenger and freight tasks.

Findings and recommendations

Harmonisation of transport safety regulation

Is transport safety regulation nationally consistent?

FINDING 4.1 – IMPLEMENTATION OF THE NATIONAL SYSTEMS IS LARGELY COMPLETE

While implementation has been slower than expected, national regulation and national regulators for heavy vehicles, rail and domestic commercial vessels are now largely established.

FINDING 4.2 – DEROGATIONS FROM ROAD AND RAIL LAWS UNDERMINE CONSISTENCY

There are more than 70 derogations from the Heavy Vehicle National Law and more than 80 derogations from the Rail Safety National Law. Derogations are contrary to the aims of harmonisation, and often create unnecessary costs and complexity for businesses and regulators.

FINDING 4.4 – RAIL NETWORK STANDARDS AND RULES ARE A BARRIER TO CONSISTENCY

Different technical standards, operating codes and procedures set by rail network owners can complicate the movement of rolling stock across networks. Rail network operators and above-rail operators have opportunities to reduce the costs of differences in network standards. Potential solutions include investment in rail infrastructure and rolling stock and administrative changes to network rules. These are commercial matters and are not the responsibility of the National Rail Safety Regulator.

Assessing the national regulators

FINDING 5.3 – AMSA IS RESPONSIBLE FOR A BROAD RANGE OF VESSELS

The Australian Maritime Safety Authority (AMSA) has a complex regulatory task. AMSA is responsible for regulating a diverse set of vessels, from kayaks to fishing boats and passenger ferries. Operators of domestic commercial vessels are also diverse. Some large operators are able to implement sophisticated risk management systems, while many smaller operators have difficulty in using AMSA’s centralised, online systems. The diversity of the fleet and operators has complicated the process of transition to consistent national regulation of domestic commercial vessels.

RECOMMENDATION 4.2 – TRANSFER REGULATORY POWERS TO THE NATIONAL REGULATORS

The Transport and Infrastructure Council should agree to transfer all regulatory functions still held by participating jurisdictions to the National Heavy Vehicle Regulator by 2022.

To ensure consistent application of the national laws, the National Heavy Vehicle Regulator and Australian Maritime Safety Authority should phase out service-level agreements with State and Territory agencies.

However, where there is a business case for the national regulators to retain service-level agreements with third parties, those parties should act under the direction of the national regulators to ensure consistent decisions across jurisdictions.

RECOMMENDATION 5.2 – GOVERNANCE OF ONRSR

The Transport and Infrastructure Council should endorse amendments to the *Rail Safety National Law Act 2012* (South Australia) to specify that the Office of the National Rail Safety Regulator be changed to an Advisory Board consisting of:

- up to 5 non-executive members, including members with experience in rail transport, risk management, financial management and business administration, one of whom would be chair
- the National Rail Safety Regulator.

FINDING 10.1 – COST RECOVERY APPROACHES VARY ACROSS NATIONAL REGULATORS

Different approaches to cost recovery apply in each of the three modes. The degree of cost recovery reflects the historical differences applying across the States and Territories and between the three modes of transport.

There is a clear phased transition path for the Office of the National Rail Safety Regulator (ONRSR) toward full cost recovery. For the Australian Maritime Safety Authority (AMSA)'s role in regulating domestic commercial vessels, cost recovery is subject to an ongoing review. The National Heavy Vehicle Regulator (NHVR) receives funding from State and Territory Governments, who in turn receive fee revenue related to heavy vehicle registrations, although the degree of cost recovery is unclear.

RECOMMENDATION 10.2 – FUNDING FOR NATIONAL REGULATORS SHOULD FOLLOW EXISTING GUIDELINES

The national regulators should move towards cost recovery arrangements in line with the Australian Government Cost Recovery Guidelines. Consistent arrangements across the three transport regulators will reduce the risk of distorting intermodal choices.

Has harmonisation improved safety or productivity?

FINDING 6.1 – ROAD SAFETY HAS IMPROVED FOR MOST VEHICLE TYPES

Heavy vehicle safety has improved significantly over the past decade. The number of heavy vehicle crashes involving injury or death per kilometre travelled fell by about 40 per cent between 2009 and 2019. The fall in crash rates is likely to be due to factors affecting all vehicle types (for example, improvements in road infrastructure and new safety technologies).

FINDING 6.2 – RESPONSIBILITY FOR HEAVY VEHICLE FATALITIES

In 2017, most multi-vehicle fatal crashes involving a heavy vehicle were not the fault of the heavy vehicle driver. The driver of the other vehicle was at fault 83 per cent of the time. For serious, non-fatal, multi-vehicle crashes involving a heavy vehicle, the heavy vehicle driver was at fault 65 per cent of the time.

RECOMMENDATION 6.1 – EDUCATION AND ENFORCEMENT TO IMPROVE ROAD SAFETY

State and Territory governments should introduce new programs or continue with existing programs of education and enforcement to improve road users' understanding of driving safely around heavy vehicles.

Further policy action 1: Balance prescription and outcomes-based approaches in safety regulation

FINDING 6.3 – UNCERTAINTY ABOUT CHAIN OF RESPONSIBILITY OBLIGATIONS

Many heavy vehicle operators, customers and other supply chain participants are uncertain about their obligations under Chain of Responsibility laws. Some contracting parties are imposing unnecessary and costly requirements on transport operators to minimise their potential liability. These additional requirements may also provide opportunities for large transport purchasers to exercise market power in ways that could reduce competition in the market for transport services.

RECOMMENDATION 6.2 – CLARIFYING HEAVY VEHICLE CHAIN OF RESPONSIBILITY OBLIGATIONS

The Council of Australian Governments should endorse amendments to the Heavy Vehicle National Law to clarify the obligations of regulated parties under Chain of Responsibility laws. The amendments to the Heavy Vehicle National Law should empower the National Heavy Vehicle Regulator to:

- publish 'acceptable means of compliance' with Chain of Responsibility laws for transport operators and other parties in the supply chain
- accredit other approaches to compliance, with the costs of accreditation to be borne by the regulated parties.

FINDING 6.4 – THE EFFECTS OF HEAVY VEHICLE ACCREDITATION ON SAFETY ARE UNCLEAR

Heavy vehicle accreditation schemes create opportunities for operators to implement flexible approaches to some aspects of their business. However, evidence of the safety effects of heavy vehicle accreditation schemes is incomplete. Improving the range and type of data collected is important for effective risk-based regulation and enforcement.

RECOMMENDATION 8.3 – GENERAL SAFETY DUTIES FOR AUTONOMOUS VEHICLES

The Australian Government should impose a general safety duty on all parties with a significant influence over the safe operation of autonomous transport technologies. The creation of a general safety duty should not preclude the use of prescriptive rules where the assessed risks are high.

FINDING 5.1 – THE HEAVY VEHICLE NATIONAL LAW IS EXCESSIVELY PRESCRIPTIVE

The Heavy Vehicle National Law is excessively prescriptive and limits the scope for operators to use innovative approaches to manage safety risks.

A greater emphasis on outcomes-focused approaches in legislation and regulation would improve road safety, reduce the burden of compliance and administration, and increase the efficiency of road transport. The National Transport Commission, which is reviewing the Heavy Vehicle National Law, is well placed to recommend improvements to the Transport and Infrastructure Council.

RECOMMENDATION 9.1 – REMOVE DETAIL FROM THE HVNL

The Heavy Vehicle National Law (HVNL) should be amended to remove unnecessarily prescriptive elements from the legislation and to support greater use of ‘deemed to comply’ provisions in other regulatory instruments.

In order to give effect to this recommendation, legislative change would be required from all governments that are signatory to the HVNL. This process should be led by the Australian Government through the Transport and Infrastructure Council.

These provisions would operate alongside recommendation 10.1.

RECOMMENDATION 10.1 – ALLOW FOR TIERED REGULATION IN THE HVNL

The Heavy Vehicle National Law (HVNL) should be amended to provide the National Heavy Vehicle Regulator (NHVR) with sufficient powers to give effect to a tiered system, in which relatively prescriptive regulation operates alongside outcomes-based options. The amendments should establish clear roles and responsibilities for the NHVR, including adequate discretion, decision-making frameworks, and requirements for monitoring, compliance and enforcement activity.

The system would need to reflect the varied preferences and capabilities of businesses, such that:

- businesses seeking certainty or simplicity can rely on prescriptive regulation (to be streamlined as per recommendation 9.1)
- businesses seeking flexibility to operate outside of prescriptive regulation, while meeting agreed safety outcomes, can seek assurance from the regulator.

The NHVR should expand its use of assurance model/s to allow businesses to seek flexibility on individual aspects of their operations or more substantially across their operations. The design should recognise that some businesses will be able to design comprehensive safety management systems, while others will benefit from pre-approved ‘off-the-shelf’ solutions. To the extent possible, the assurance model/s should avoid subjecting businesses to duplicative audit processes.

In order to give effect to this recommendation, legislative change would be required from all governments that are signatory to the HVNL. This process should be led by the Australian Government through the Transport and Infrastructure Council. The NHVR’s expanded capabilities would also require adequate resourcing.

These provisions would operate alongside recommendation 9.1.

Further policy action 2: Take a risk-based approach to safety regulation, compliance, and enforcement

RECOMMENDATION 9.2 – NATIONAL REGULATORS SHOULD TAKE A RISK-BASED APPROACH

The Australian Government should work with the Transport and Infrastructure Council to develop a statement of expectations for the National Heavy Vehicle Regulator (NHVR) and the Australian Maritime Safety Authority (AMSA). The statement should direct the national transport safety regulators to take a risk-based approach to regulation, enforcement and other functions.

Addressing derogations

RECOMMENDATION 4.1 – IDENTIFY DEROGATIONS FROM HEAVY VEHICLE AND RAIL LAWS

The Transport and Infrastructure Council should re-affirm the principle of consistent national transport safety regulation. The members of the Council should commit to removing material derogations from the Heavy Vehicle National Law and Rail Safety National Law.

RECOMMENDATION 6.3 – RISK-BASED FATIGUE MANAGEMENT IN HEAVY VEHICLE REGULATION

The Transport and Infrastructure Council should endorse amendments to the Heavy Vehicle National Law that promote a risk-based approach to fatigue management regulation for heavy vehicles.

The amendments to the Heavy Vehicle National Law should remove detailed fatigue management requirements from legislation and empower the National Heavy Vehicle Regulator to:

- publish 'acceptable means of compliance' with fatigue management regulations
- set outer limits on driving hours
- provide concessions from prescribed aspects of fatigue management regulation, where the National Heavy Vehicle Regulator is satisfied that more effective systems of fatigue management are in place.

RECOMMENDATION 6.4 – RISK-BASED FATIGUE MANAGEMENT IN RAIL REGULATION

The Transport and Infrastructure Council should endorse amendments to the Rail Safety National Law and any relevant State, Territory and Australian Government laws and regulations to promote a nationally-consistent risk-based approach to fatigue management regulation for rail transport.

The amendments to the Rail Safety National Law and other legislation should remove detailed fatigue management requirements from legislation and empower the National Rail Safety Regulator to:

- publish 'acceptable means of compliance' with fatigue management regulations
- set outer limits on driving hours
- provide concessions from prescribed aspects of fatigue management regulation, where the National Rail Safety Regulator is satisfied that more effective systems of fatigue management are in place.

Addressing grandfathering provisions

FINDING 4.3 – ONGOING GRANDFATHERING OF DOMESTIC COMMERCIAL VESSELS HAS COSTS

It is unclear whether grandfathering was intended to be a temporary or permanent measure under the Marine Safety National Law. Open-ended grandfathering perpetuates the inconsistencies of previous State and Territory regimes, delays the adoption of new safety practices and complicates enforcement.

RECOMMENDATION 6.6 – END GRANDFATHERING OF VESSEL SURVEY REQUIREMENTS

The Council of Australian Governments and the Australian Maritime Safety Authority should wind up the grandfathering of safety regulations under the Marine Safety National Law. Priority should be given to ending grandfathering arrangements that relate to vessel survey requirements and fire detection and smoke detection systems.

The Australian Maritime Safety Authority should use the information from vessel survey and other sources to review the safety risks arising from other grandfathering arrangements and the costs to vessel operators of removing the arrangements. Where the safety benefits exceed the costs, grandfathering arrangements should be removed.

The Regulation of Class 4 vessels

FINDING 5.2 – STATE AND TERRITORY AGENCIES SHOULD REGULATE HIRE AND DRIVE VESSELS

Class 4 ‘Hire and Drive’ recreational vessels have more in common with recreational vessels (which continue to be regulated by State and Territory government agencies) than with other types of commercial vessels. The decision to transfer safety regulation of these vessels from State and Territory agencies to the national regulator was not justified on the basis of safety, or efficient or effective regulation. State and Territory government agencies are better placed to regulate these vessels than the Australian Maritime Safety Authority, particularly in relation to enforcement.

RECOMMENDATION 5.3 – RETURN HIRE AND DRIVE VESSEL REGULATION TO THE STATES

The Australian Government should negotiate with State and Territory governments to return responsibility for regulating Class 4 Domestic Commercial Vessels (Hire and Drive) to State and Territory agencies.

Australian Design Rules

FINDING 8.1 – REGULATION OF HEAVY VEHICLE TECHNOLOGIES

Heavy vehicle regulations, including the Australian Design Rules and some regulations enacted by the Heavy Vehicle National Law, have discouraged or delayed the use of newer, safer technologies. More flexible, risk-based regulation could improve safety by encouraging the uptake of twin steer prime movers and fatigue monitoring technologies.

RECOMMENDATION 8.1 – AUSTRALIAN DESIGN RULES

The Australian Government should amend the Australian Design Rules (ADRs) and in-service vehicle standards to allow for new transport technologies, including automated technologies, with proven productivity or safety benefits. These amendments should aim to:

- achieve national and international consistency of laws and standards where practicable, and accept safety devices adopted in other leading economies as ‘deemed to comply’. In cases where the Government believes it would be unsafe to apply an international standard in Australia, it should provide evidence to support this view through a transparent review of the ADR, conducted within a defined timeframe
- address specific ADR issues identified as significantly hindering productivity or safety (such as safety technologies unable to be used due to width and mass limits).

Further policy action 3: Improve infrastructure provision and management

Improving road access

FINDING 7.3 – PRODUCTIVITY GAINS FROM THE REFORMS HAVE BEEN SMALLER THAN EXPECTED

Productivity gains from the reforms have been much smaller than the original optimistic estimates. Despite some improvements in heavy vehicle access, there has been little improvement on key freight routes, and the increase in the number of higher productivity vehicles has been small relative to the size of the whole heavy vehicle fleet. There is scope for significant further productivity gains with additional reforms.

FINDING 7.4 – THE PROCESSING OF SOME ACCESS DECISIONS IS SLOW AND LACKS EVIDENCE

Some local governments struggle to deliver timely heavy vehicle access assessments, and access decisions often lack transparency. Road managers are using the National Heavy Vehicle Regulator guidelines for granting access inconsistently, which can result in different assessments on similar roads.

RECOMMENDATION 7.3 – RISK-BASED ASSESSMENT OF HEAVY VEHICLE ACCESS PERMITS

The National Heavy Vehicle Regulator should negotiate with individual road managers to facilitate a risk-based assessment of permits, using information from previous access permit approvals on each route. This information should be used to construct more flexible pre-approved permit arrangements with road managers.

RECOMMENDATION 7.4 – TRANSPARENT ACCESS PERMIT DECISIONS AND PROCESSING TIMES

The National Heavy Vehicle Regulator should publish detailed information online about access permit decisions and processing times. The National Heavy Vehicle Regulator should engage with industry and road managers to determine the form of this information.

RECOMMENDATION 7.5 – EXPANDING AS-OF-RIGHT HEAVY VEHICLE ACCESS NETWORKS

The Council of Australian Governments should direct road managers (including the state road authorities) to work with the National Heavy Vehicle Regulator to expand key freight routes covered by notices, allowing as-of-right access for larger vehicle types. The focus of this work should include expanding gazetted access networks for:

- vehicles approved through the Performance-Based Standards (PBS) scheme (including PBS B-doubles, A-doubles and B-triples), at least to match the networks for the equivalent non-PBS vehicles
- types of vehicles for which permit applications are almost universally approved.

Road managers should upgrade road infrastructure to allow heavy vehicle access where the benefits exceed the costs. Where road network constraints prevent heavy vehicle access, road managers should ensure that there are adequate truck stops and logistics centres to allow larger vehicles to be broken down into smaller combinations.

FINDING 10.2 – SOME ROAD MANAGERS LACK RESOURCING, EXPERTISE, AND INFORMATION

Some road managers, particularly local governments, lack the in-house expertise and resources to assess heavy vehicle access applications. Some also lack essential information on the state and capacity of their road infrastructure. While resourcing is important, more resources alone will not guarantee greater efficiency. Other factors — including access to data and appropriate technical skills, and economies of scale in permit applications — also contribute to greater efficiency.

RECOMMENDATION 10.5 – ADEQUATE RESOURCING FOR ROAD MANAGERS

The Council of Australian Governments should ensure that local governments have access to the financial and technical capacity they need to perform their role as asset managers for local roads. Transparency and accountability for performance should accompany any additional support, particularly with respect to access permit processing times and the use of notices to gazette heavy vehicle routes.

RECOMMENDATION 10.4 – HEAVY VEHICLE ROAD REFORM MUST CONTINUE

Governments at all levels should maintain their commitment to the Heavy Vehicle Road Reform process through the remaining trial, development, and implementation phases.

RECOMMENDATION 10.3 – GOVERNMENTS INVESTING IN INFRASTRUCTURE ON MAJOR FREIGHT ROUTES SHOULD CONSIDER INTERMODAL OPTIONS

When considering the costs and benefits of large-scale infrastructure projects to improve the flow of freight on major routes, governments should consider intermodal options which may assist in managing expanding freight volumes. Governments should be neutral on technology and infrastructure choices, focusing on efficient, long-term outcomes.

Further policy action 4: Improve the evidence base for regulatory and policy decisions

RECOMMENDATION 5.1 – ANNUAL HEAVY VEHICLE SAFETY REPORT

The Transport and Infrastructure Council should direct the National Heavy Vehicle Regulator to collect data on key safety risks and outcomes and publish the data each year in a similar form to the Office of the National Rail Safety Regulator’s annual *Rail Safety Report*.

RECOMMENDATION 6.5 – IMPROVE MARITIME INCIDENT REPORTING AND DISCLOSURE

The Australian Government should direct the Australian Maritime Safety Authority to take steps to improve:

- incident reporting by owners of domestic commercial vessels
- its public disclosure of safety incidents.

AMSA should report fatalities and injuries in greater detail, including a state-by-state and vessel-type breakdown of fatalities and injuries.

FINDING 7.1 – COMPLIANCE COSTS ARE NOT ROUTINELY MONITORED AND REPORTED

Detailed data on the compliance costs for businesses from heavy vehicle, rail and domestic commercial vessel regulation have not been systematically collected, monitored and published. This has made it difficult to assess how the regulatory burden has changed. With the limited information available, it is not clear whether compliance costs have increased or decreased overall as a result of the harmonisation reforms. Compliance costs appear to have decreased for some operators, particularly in rail.

RECOMMENDATION 7.1 – REGULATORS SHOULD REPORT ON COMPLIANCE COSTS

The National Heavy Vehicle Regulator, the Office of the National Rail Safety Regulator and the Australian Maritime Safety Authority should monitor compliance costs and report on these costs, disaggregated by key regulatory activity, commencing in 2021.

FINDING 7.2 – LACK OF DETAILED ADMINISTRATIVE COST INFORMATION

A time series of consistent and detailed administrative cost information on the regulation of heavy vehicles, rail and domestic commercial vessels is not available. Furthermore, the three national regulators do not report administrative cost information disaggregated by key regulatory activity. This has limited the Commission’s ability to assess whether administrative costs have fallen as a result of the national reforms. It also limits the ability of stakeholders to monitor, raise concerns and discuss opportunities for improvement with the regulators.

RECOMMENDATION 7.2 – REGULATORS SHOULD DISAGGREGATE ADMINISTRATIVE COSTS

The National Heavy Vehicle Regulator, the Office of the National Rail Safety Regulator and the Australian Maritime Safety Authority should disaggregate their administrative costs by key regulatory activity in their annual reports.

The sharing and use of transport data

FINDING 8.2 – GOVERNMENT ROLE IN TRANSPORT DATA

Transport data can be used by various parties for diverse purposes. Governments can best provide value by:

- facilitating the sharing of data by developing common data protocols and standards
- establishing regulatory frameworks for data collection, storage, analysis and access
- prioritising data uses with the highest value, such as data-sharing projects with the potential to significantly improve productivity in the transport sector.

RECOMMENDATION 8.2 – TRANSPORT DATA TO IMPROVE PRODUCTIVITY

Governments should prioritise the uses of data with the greatest potential to improve productivity in the transport sector. These include facilitating coordination between road users and infrastructure managers to:

- inform the provision and management of road infrastructure
- inform decisions around permits and road access for heavy vehicles
- assist in the development and implementation of the Heavy Vehicle Road Reform agenda.

The Australian Government should give priority to these uses of transport data when developing the National Freight Data Hub.

FINDING 9.1 – DATA SHARING HAS BROAD BENEFITS

While some potential benefits of logistics data are specific to the individual operator, there are larger, broader benefits from the collection and integration of data across many operators. These broader benefits may be underprovided if data generation and sharing are not facilitated.

RECOMMENDATION 9.3 – HARNESSING DATA FOR POLICY AND REGULATION

Governments (and their agencies) and industry should consider how best to harness logistics and telematics data to improve incentive-based safety regulation, with the aim of influencing behaviours that increase safety and productivity.

Governments and regulators should aim to facilitate operators' adoption of technologies to generate and share data by:

- providing legal assurances about the acceptable use of such data
- clarifying the value to individual operators of their participation in data-sharing regimes.

No-blame investigation

FINDING 9.2 – LACK OF REPORTING AND ANALYSIS OF SAFETY INCIDENTS

There is a lack of publicly available data on safety incidents involving heavy vehicles. Analysis of national incident data, supported by targeted no-blame incident investigation, would help to identify systemic issues and inform safety policy.

RECOMMENDATION 9.4 – IMPROVING SAFETY THROUGH NO-BLAME INVESTIGATION AND RESEARCH

The Australian Government should:

- provide a sufficient annual appropriation to enable the Australian Transport Safety Bureau (ATSB) to carry out its functions, both existing and as proposed in this inquiry
- formalise the role of the ATSB in conducting investigations and research involving Domestic Commercial Vessels and rail
- amend the *Transport Safety Investigation Act 2003* to enable the ATSB to conduct research and investigate incidents involving heavy vehicles, and autonomous vehicle technologies
- direct the ATSB to undertake a clearly defined, phased transition into the heavy vehicle role, including an initial period of data collection and research to identify any systemic issues and incident types with the potential to inform policy.

The costs of the ATSB should not be subject to cost recovery from industry, but the States and Territories should support the Australian Government by providing a consistent contribution to its total costs, rather than on a case-by-case basis.

1 About this inquiry

1.1 National transport regulatory reform

In 2009, as part of the seamless national economy agenda, the Council of Australian Governments (COAG) endorsed a shift to national regulation of heavy vehicles, rail and domestic commercial vessels (DCVs)¹. Replacing State and Territory government regulation with consistent national regulation for each sector was expected to cut regulatory costs, boost productivity and improve safety.

Between 2009 and 2011, economic gains were estimated for each of the reforms — the heavy vehicles reforms were expected to deliver \$5.6 to \$31.2 billion over 20 years, the DCVs reforms \$103 to \$126 million over 20 years, and the rail reforms \$28 to \$71 million over 10 years (NAMSRS 2009, p. 10; NTC 2011a, pp. 15, 58, 2011b, p. v). Most of the heavy vehicle benefits were expected to flow from the wider use of larger, more productive heavy vehicles across the road network.

After the signing of three intergovernmental agreements in 2011, governments developed national laws for each sector and began the transfer of powers to new national regulators. The National Heavy Vehicle Regulator and the Office of National Rail Safety Regulator were created in 2012. Regulation of DCVs was transferred to the Australian Maritime Safety Authority in 2013.

The transition to national regulation of heavy vehicles, rail and DCVs has been uneven. Not all jurisdictions have adopted the new laws. Western Australia and the Northern Territory still regulate heavy vehicles under their own legislation. State regulations continue to apply in some instances, such as fatigue management for operators of heavy vehicles and rail, and there are many derogations, some substantial, from national regulation. The transfer of service delivery from state to national agencies has also been gradual and is not yet complete.

¹ A domestic commercial vessel is a vessel that is Australian owned, used for commercial, government or research activity, and is not operating or intending to operate outside the Australian Exclusive Economic Zone.

1.2 What was the Commission asked to do?

The terms of reference set out three tasks for the Commission:

1. investigate the economic impacts of the 2008-09 COAG transport reforms
2. examine the implementation of the national transport regulation reforms, including the development of the three national regulators; the capacity of local governments in supporting the implementation; and the delivery against agreed COAG and intergovernmental agreement objectives
3. assess the scope for future reforms to national transport regulation, including areas for further harmonisation and integration of the transport sector and the remit of the regulators.

The Commission has been asked to take account of the broader objectives of the 2008-09 COAG reforms, other associated intergovernmental agreements, and complementary reforms by the Commonwealth, States and Territories. These reforms include (but are not limited to) rail standards harmonisation and interoperability and the National Freight and Supply Chain Strategy (box 1.1).

The Commission has been asked to exclude from the inquiry reforms being progressed separately — for example, heavy vehicle road user charging (box 1.1) — except to the extent that it is necessary for the Commission to reach a view on COAG’s national transport reforms.

A review of the Heavy Vehicle National Law by the National Transport Commission is underway. This review is tasked with delivering a modern, outcome-focused law to regulate the use of heavy vehicles. Drafting of the new legislation is scheduled to be completed by November 2021 (NTC 2019).

Box 1.1 Other transport reforms

A number of transport reforms have been undertaken by governments in recent years. These include: rail standards, harmonisation and interoperability; improved network access for higher productivity vehicles; the National Freight and Supply Chain Strategy; and heavy vehicle road user charging.

Rail standards harmonisation and interoperability

The Rail Industry Safety and Standards Board is responsible for the development and management of industry standards, rules, codes of practice, guidelines and handbooks for the Australian rail industry. Rail standard harmonisation and interoperability has been considered a number of times by COAG; further harmonisation is being considered with respect to safety, operations, rolling stock, infrastructure, wheel rail interface, train control systems and railway, and railway level crossing safety.

National Freight and Supply Chain Strategy

In August 2019, Transport Ministers agreed to the National Freight Supply Chain Strategy and National Action Plan. The Strategy and Plan complement the national transport regulatory reforms, and set an agenda for integrated national action across all freight modes.

Heavy vehicle road charging reforms (excluded from inquiry analysis)

Work on national heavy vehicle road user charging as an alternative to registration fees and fuel-based charging is ongoing. A small scale on-road trial led by the Department of Infrastructure, Transport, Cities and Regional Development commenced in mid-July 2019. A large scale trial is proposed to commence in 2020.

Sources: ARA (2019); DITRD (2019a, 2019b).

1.3 What does the transport sector look like?

Transport activity in Australia

The transport, postal and warehousing sector generated about 4.5 per cent of Australia's economic output in 2018-19,² and employed about 5.1 per cent of the workforce³ (ABS 2019c, table 4, 2019a, table 6).

There are major freight flows across Australia (figure 1.1). In 2018, the total domestic freight task was 770 billion tonne km⁴ (BITRE 2018, p. 67). Rail carried 57 per cent, road carried 28 per cent and coastal sea freight carried 14 per cent (air transport carried less than 1 per cent). Heavy vehicles carried almost all road freight (over 94 per cent), with light commercial vehicles and light rigid trucks (3.5–4.5 tonnes gross vehicle mass) carrying the remainder (Commission estimates using (ABS 2019d)). DCVs carry a small proportion of

² September 2018 to June 2019.

³ August 2018 to May 2019.

⁴ A tonne kilometre refers to the movement of one tonne by one kilometre.

coastal sea freight. Coastal sea freight is largely carried by Australian vessels regulated under the *Navigation Act 2012* (Cwlth) and foreign flagged vessels.⁵

While rail and road compete in the transport of bulk and non-bulk freight, each has its own competitive advantages (NTC 2016, p. 15). Rail transport largely carries bulk freight with iron ore and coal accounting for 80 per cent of the rail freight task. Road freight transport largely carries time-sensitive and/or perishable goods (for example, fruits and vegetables), consumer goods, and construction materials.

In 2015-16, the total domestic passenger transport task was 433 billion passenger km, almost half involving travel within the capital cities (BITRE 2018, p. 77). Passenger cars carry the majority of the national domestic passenger transport task (64 per cent). Buses make up 5 per cent of the task, rail 4 per cent, air 16 per cent, and other 10 per cent.

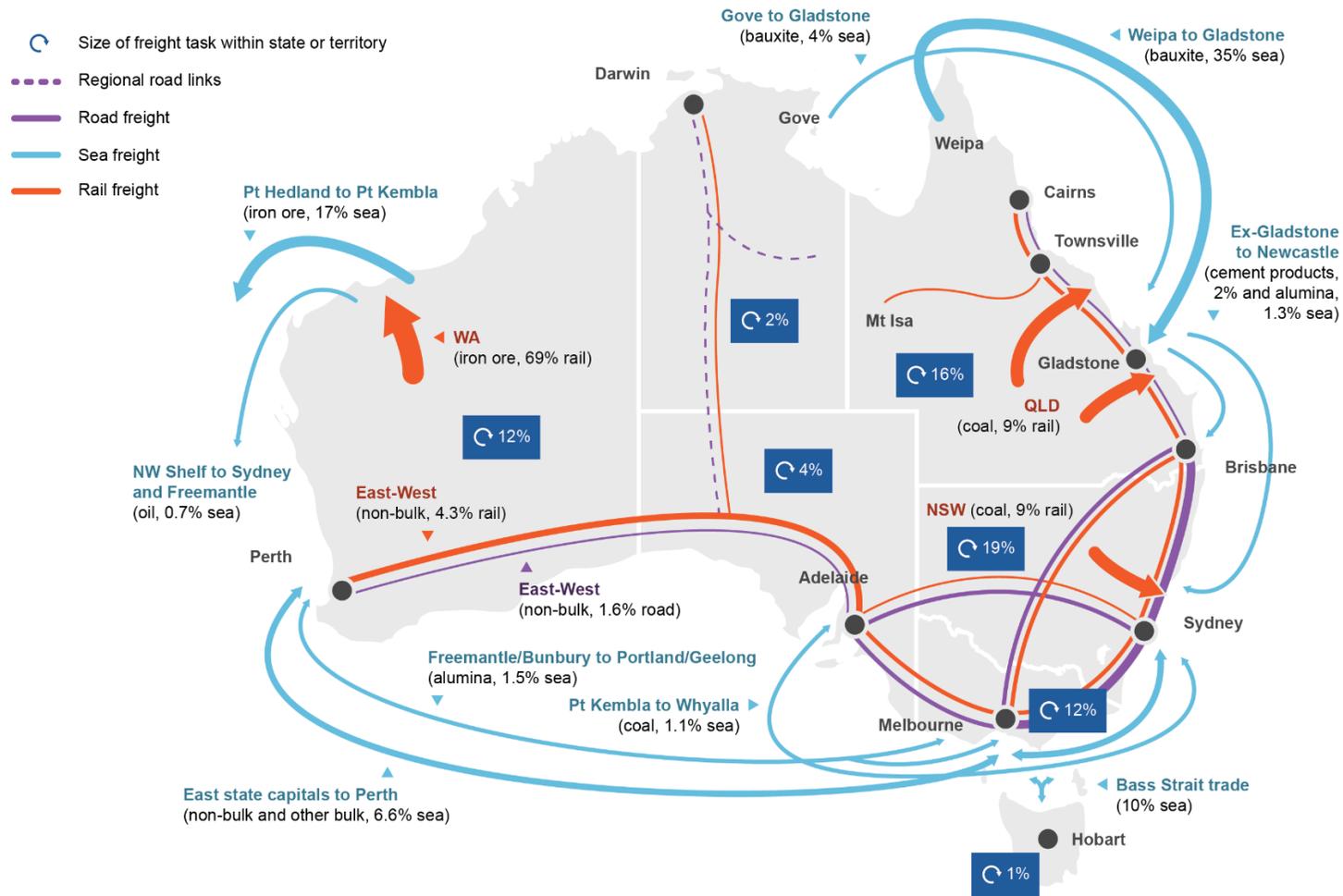
Light commercial vessels, light rigid trucks, passenger cars, *Navigation Act 2012* (Cwlth) Australian vessels, foreign flagged vessels, and air transport were not covered by the 2008-09 COAG national transport reforms.

Over the past five decades, passenger movements by bus and rail have increased steadily (figure 1.2). The freight task has risen sharply across the road and rail sectors (coastal shipping has been static) (figure 1.3). Robust freight growth is expected to continue.

Although transport related fatalities are decreasing, the number of injuries and fatalities is still very high — in 2018, 1320 people were killed in transport accidents (ABS 2019b). The potential for injury or death in the transport sector is higher than in many other sectors (Safe Work Australia 2019). Meeting future demand without jeopardising safety will require significant investment in infrastructure, technology, good governance and effective regulation.

⁵ A *Navigation Act 2012* (Cwlth) Australian vessel, is a commercial, government or research vessel that is Australian owned, and is for use on an overseas voyage. A foreign flagged vessel is a vessel registered in or operating under the authority of a foreign country.

Figure 1.1 Major freight flows in Australia^a

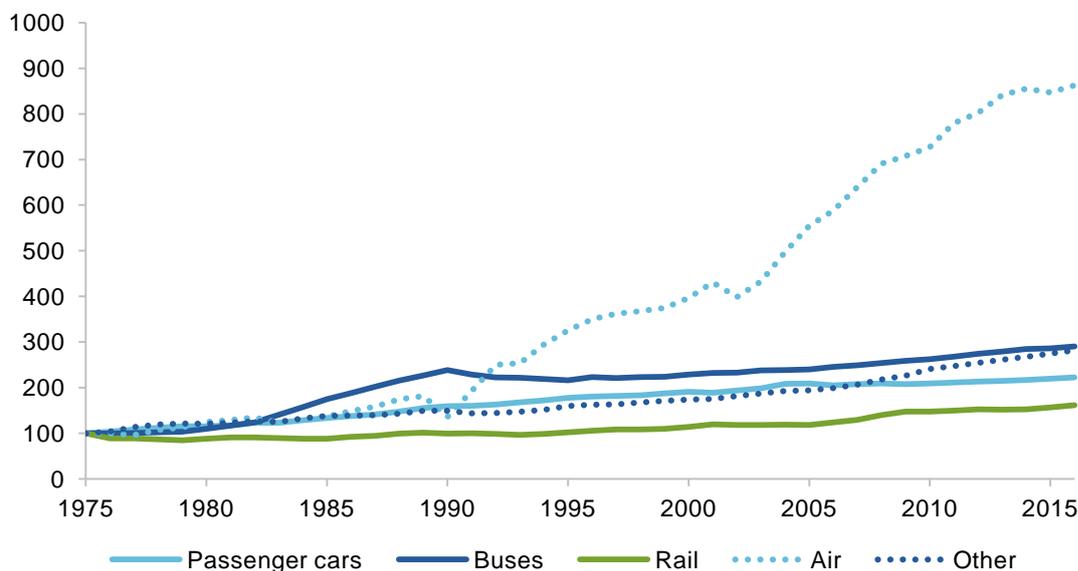


^a Figure shows Australia's domestic freight task by mode, with thicker arrows indicating greater volumes of freight, but not the value or performance of Australia's freight and supply chains.

Source: Reproduced chart in TIC (2019, p. 9).

Figure 1.2 Growth in air transport has outstripped growth in other passenger transport sectors^a

Passenger kilometres, indexed, 1974-75 to 2015-16, base year = 1975



^a 'Other' represents primarily non-freight use of light commercial vehicles, as well as motorcycles and non-business use of trucks and ferries.

Source: Commission estimates based on data from BITRE (2018, p. 77).

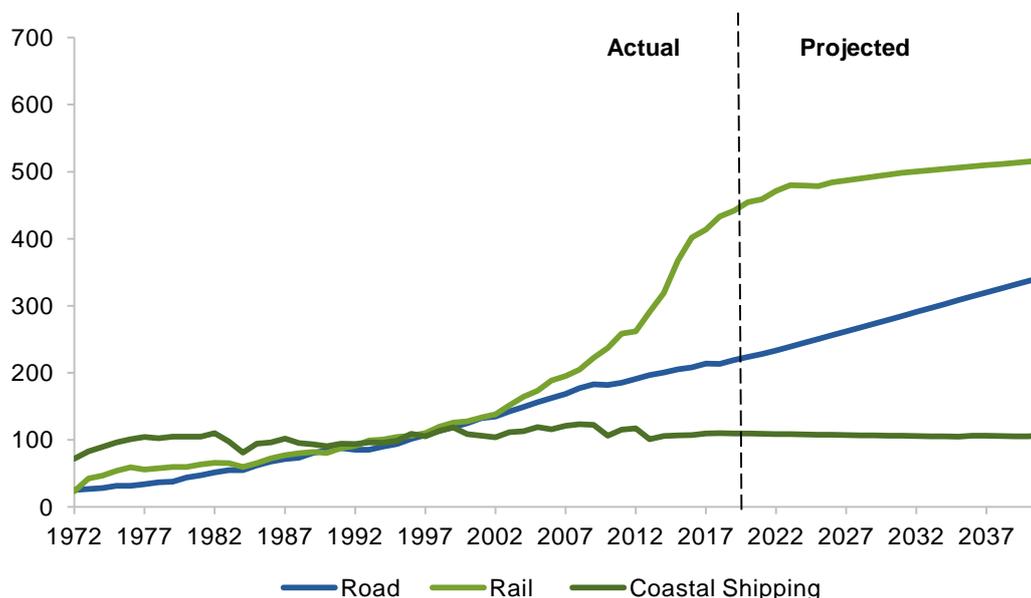
Industry and operating environments

Each of the three modes of transport — heavy vehicles, rail and domestic commercial vessels — has distinct characteristics reflecting different operating environments.

Road freight operators can be divided into two broad categories: hire-and-reward operators, and ancillary operators (NTI 2016, p. 6). Hire-and-reward operators specialise in freight delivery and logistics services; these businesses range from a self-employed person driving a single vehicle to a large, national business with substantial vehicle fleets. Ancillary operators do not sell transport services; these businesses operate in sectors such as agriculture, mining and construction and use their own heavy vehicles for incidental tasks such as moving goods and equipment. Over 45 per cent of truck drivers worked in ancillary businesses in 2015 (NTC 2016, p. 33).

Heavy vehicles also include special purpose vehicles (for example, mobile cranes, fire trucks, and mobile drilling rigs), and buses (for regular passenger transport services and tourism). State and Territory governments still have some responsibilities for the regulation of buses such as bus accreditation, alcohol and drug management, and inspections.

Figure 1.3 Increase in the freight task forecast to continue^{a,b}
 Domestic goods transport, total bulk and non-bulk, billion tonne kilometres, 1971-72 to 2040-41



^a A billion tonne kilometres refers to the movement of one billion tonnes by one kilometre. ^b Air freight does not appear in this chart but is about 0.3 billion tonne kilometres.

Source: DITCRD (2019a).

In the rail industry, operators fall into two main categories: below rail operators, managing the track and infrastructure; and above rail operators, responsible for the trains and rolling stock. Railway vehicles are involved in freight and passenger transport.

Domestic commercial vessel operators engage in a diverse range of marine activities — commercial fishing and aquaculture, tourism, oil and gas exploration and extraction, as well as passenger and freight transport.

Of the three sectors, the heavy vehicle industry is the largest in terms of the number of operators and fleet — more than 39 000 operators and 890 000 registered vehicles (NHVR 2018, p. 8). The domestic commercial vessel industry is the next largest — about 31 000 vessels (AMSA, sub. DR71, pp. 11–12), followed by the rail industry — 184 accredited operators (ONRSR 2019) and about 2200 locomotives (Ferrier Hodgson 2014, p. 9).

In both the heavy vehicle and domestic commercial vessel industries, there are many small operators. In road freight, about 70 per cent of operators have only one truck (NTC 2016, p. 28). Only 6 per cent of operators have more than four vehicles. The domestic commercial vessel industry includes a large number of small fishing vessel and boat hire operators.

Domestic commercial vessels, rail and heavy vehicles operate with different levels of interaction with other users. Heavy vehicles often operate in high density areas, sharing the road with light vehicles and pedestrians. Heavy and light railway vehicles interact with road users and pedestrians where there is track and at level crossings. Domestic commercial vessels operate in large bodies of water and encounter other vessels relatively infrequently.

1.4 The Commission's approach

The Commission's approach to assessing impacts

The Commission has used quantitative and qualitative evidence to investigate the impacts of the COAG national transport reforms, including data from the Australian Bureau of Statistics; Department of Infrastructure, Transport, Regional Development and Communications (formerly the Department of Infrastructure, Regional Development and Cities); Transport Certification Australia; the National Heavy Vehicle Regulator; the Office of the National Rail Safety Regulator; and the Australian Maritime Safety Authority. The Commission thanks all data providers for their assistance.

Given various data limitations, in many cases it is not possible to quantify with rigour the changes in productivity and safety, or attribute reliably the changes to the COAG reforms. Furthermore, as the transition to the national systems has taken place over many years, and is still occurring, there is no neat division between the pre-reform and post-reform periods. Many initiatives that are part of the national laws predate the COAG reforms.

The Commission is cognisant of the fact that the reforms were designed to contribute to longer term improvements, and significant net benefits may have not yet been realised.

The Commission consulted widely

The Commission has consulted widely with stakeholders. Appendix A provides details of the individuals and organisations that have participated in the inquiry.

The Commission thanks all inquiry participants for meeting with Commissioners and staff, making submissions, and providing helpful information to inform the inquiry.

As part of its consultation, the Commission:

- released an Issues Paper in May 2019 that outlined a range of matters on which it was seeking information and views. In response to the Issues Paper, the Commission received 44 submissions and eight brief comments

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- released a draft report in November 2019 which included draft findings and recommendations. In response to the draft report, the Commission received an additional 38 submissions (meaning in total, the Commission received 82 submissions and eight brief comments over the course of the inquiry)
 - conducted public hearings in four locations in January and February 2020
 - conducted a roundtable on heavy vehicle regulatory reform in February 2020.

Submissions and transcripts of the public hearings are available on the Commission's website.

2 Assessing transport safety regulation

Key points

- All Australians are exposed to transport safety risks. In 2018, 1320 people were killed in transport accidents. Property damage from road traffic accidents alone exceeds \$10 billion per year.
- Transport operators, consumers of transport services and the general public influence transport safety risks.
- Governments can improve safety outcomes through effective regulation, infrastructure planning and investment, facilitating the uptake of new safety technologies and community education.
- Regulation can reduce but not eliminate safety risks; deficient design or enforcement can exacerbate safety risks or produce other unintended consequences.
- Regulation creates costs for governments, businesses and the broader community. In most cases, there is a tipping point where incremental changes to improve safety come at a cost that exceeds any expected benefits and the community's willingness to absorb these costs.
- Governments decide whether to take a prescriptive or flexible approach to regulation.
 - Prescriptive approaches can provide certainty to governments, operators and the community that a safety risk is being managed in an effective way. But prescription can inhibit innovation, flexibility and productivity.
 - Flexible approaches to regulation provide regulators with discretion to approve practices that achieve the desired safety outcomes and grant regulated parties more freedom to determine the best way to meet their safety obligations.
- A 'tiered' system of safety regulation gives operators the choice to follow 'acceptable means of compliance' that are developed by regulators or adopt alternative approaches to manage safety risks.
- Where operators have flexibility to develop efficient approaches to safety risk management, regulators have the critical role of accrediting operators' safety management systems to ensure that their operations and procedures are at least as safe as the prescribed alternative.
- Regulators and enforcement agencies need to develop additional capabilities to implement flexible approaches to safety regulation.

This chapter explains the approach the Commission has taken in its assessment of the effects of national transport regulation on safety risks and on the productivity of the sector. The chapter describes prescriptive and flexible approaches to regulation, including a 'tiered' model for transport safety regulation which manages safety risks while facilitating innovation and productivity by the regulated parties.

2.1 A framework for transport safety regulation

The Productivity Commission is guided by the requirement in the *Productivity Commission Act 2006* (Cwlth) that it should have regard for the need to achieve higher living standards for all members of the Australian community. Living standards are affected by many things, including economic activity, the natural environment and the health of members of the community. This report is focused on the effects transport safety regulation has on the safety of all members of the community (including operators, passengers and other road users) and on the productivity of the transport sector.

Transport safety risks affect living standards

In technical terms, transport is ‘hazardous’ — it has the potential to cause harm to vehicle operators, passengers and the public. The harms caused by transport safety incidents include death, injury and illness, property damage, financial costs and environmental harm. Some of these harms are caused directly by transport accidents, others are indirect.

In 2018, 1320 people were killed in transport accidents. These fatalities represented an estimated 44 214 years of potential life lost (an average of 33.5 years per person) (ABS 2019). Litchfield (2017) estimated that the cost of property damage from road crashes was \$9.38 billion in 2016.

Transport safety risk is a combination of the probability of an incident occurring and the harm from the incident. These factors can be influenced by (among other things):

- decisions by drivers, skippers or crew
- characteristics of a vehicle or vessel (including its design and working condition)
- how well a vehicle or vessel has been built and maintained
- environmental and other operating conditions
- the actions of other parties (for example, other road users). (ATSB 2008, p. 13)

Managing transport safety risks, either by reducing the probability of an incident or reducing the harm that results from the incident, can reduce the negative effects of transport on community living standards.

Governments intervene to increase community safety

Transport operators, consumers of transport services and the general public can all influence transport safety risks and all have incentives to identify and manage risks. Economists have identified several reasons to expect that individuals and businesses acting alone will not achieve the safety outcomes that are desired by the community as a whole (box 2.1). Governments intervene to address these market failures and achieve a level of transport safety risk that is acceptable to the community.

Box 2.1 Sources of market failure

- **Information failures** — individuals are not always able to make fully informed decisions in their best interest, because they do not have access to all relevant information, or do not have the technical expertise to interpret it. For example, passengers on a ferry will generally be unable to (cheaply) obtain and understand information about the maintenance history of the vessel, or the ferry operator's qualifications (information asymmetry).
- **Negative spill-over effects or 'externalities'** — the costs and benefits incurred by those using a good or service do not always fully reflect the impacts their use has on others. For example, a fatigued heavy vehicle driver may cause harm to pedestrians or other road users.
- **Public goods** — goods or services that may be underprovided by the private sector because 'free riders' cannot be excluded from enjoying the benefits. Examples of public goods include street lighting and traffic lights.

Sources: PC (2006, 2011).

Transport operators have incentives to invest in safety to avoid harm to themselves and to reduce the costs of safety incidents, disruptions to their business and reputational damage. However, transport operators often do not have complete information about the risks they face and many operators are not able to assess that information accurately to inform their risk management. Businesses might also have commercial incentives to under-invest in safety or to take risks, such as skimping on maintenance or driving when fatigued. Without regulation, transport operators would probably not achieve the level of transport safety that the community expects.

Consumers of transport services have incentives to avoid products that pose a risk to their safety, although they may not have sufficient evidence to make decisions that reflect their preferences. Consumers do not always have strong incentives to consider the effects of their decisions on public safety or the safety of transport workers. This can lead to consumers inadvertently choosing products that have adverse effects on the community as a whole, including through increasing transport safety risks. For example, a farmer who needs to transport grain might choose the lowest cost operator, unaware that the operator takes risks such as driving unsafely or overloading his vehicle.

Members of the public also have incentives to avoid the risk of transport incidents. However, unless governments provide information, individuals might be ignorant of transport safety risks (such as level crossings) or might behave in ways that increase the risk of transport incidents (such as speeding or drink-driving). Some individuals have a higher tolerance for risk than the general community and, without regulation, their behaviour could increase the danger to the rest of the community.

Governments regulate transport to address some of the gaps in risk management by transport operators, consumers and members of the public. Over time, safety regulation can contribute to the development and strengthening of organisations' safety culture — the attitudes that people in the organisation have to workplace safety. Participants in this inquiry emphasised the importance of safety cultures in effective risk management (for example, RTBU,

sub. DR54). A positive safety culture can contribute to fewer incidents, while a negative safety culture might lead to unsafe actions being tolerated and increased safety risks which can increase over time with complacency.

Transport productivity affects living standards

Productivity is a measure of the economic efficiency of the performance of the transport task. Productivity is important because productivity growth can lead to lower transport costs and increased living standards. Productivity is influenced by technological change, innovation in business operations, increased skill of operators, the functioning of markets and the regulatory environment.

Governments' role in transport productivity

In market sectors of the economy (which includes most transport activities) the level and growth rate of productivity is mainly determined by operators' decisions about the equipment they use and their work practices. Competition can provide incentives to identify more efficient ways of managing their businesses, leading to increased choice and lower consumer prices. Regulation and its implementation and enforcement by regulators can constrain businesses' operations and reduce competition.

Governments can contribute to transport sector productivity by efficiently commissioning, providing and managing the public infrastructure components of the transport network. Governments also have a role in providing policy frameworks for businesses. Transport operators are subject to general regulation of businesses and markets (such as corporations and competition law) and transport-specific regulations that allow for the effective operation of networks (such as road rules).

Regulation imposes costs

Governments can also impede transport operators from increasing their productivity. Complying with regulation diverts operators' resources from other priorities and can reduce overall productivity. The Motor Trade Association of SA/NT stated that costs can be an impediment to increasing safety.

The MTA's consultation highlighted cost considerations as a barrier that prevent operators from actively incorporating safer vehicles into their fleets. (sub. DR47, p. 8)

Part of the motivation for moving to national regulation of heavy vehicles, rail and domestic commercial vessels was to reduce the costs to operators of compliance with different jurisdictions' regulations. Arc Infrastructure stated that harmonising fatigue regulations (which are not nationally consistent) could reduce compliance costs.

Variations in compulsory fatigue management policies from state to state increase compliance costs for above rail operators and are unlikely to lead to improved safety outcomes. A nationally

consistent fatigue management regime is likely to reduce compliance costs for above rail operators and is likely to improve safety outcomes. (sub. DR57, p. 3)

National consistency can reduce compliance costs, but is not necessarily the best choice in every situation. Sometimes the costs of harmonisation outweigh the benefits. For example, in a diverse industry, a ‘one size fits all’ approach would probably impose unnecessary costs and have adverse unintended consequences.

Regulation can be a barrier to innovation

Regulation can be a barrier to increased productivity if it prevents firms from adopting new technologies and work practices that would increase efficiency while maintaining safety. Some participants in this inquiry suggested that governments and their agencies are slow and risk-averse when dealing with technological changes, and that rigid standards delay the introduction of new technologies that are more efficient and/or safer. For example, the National Farmers’ Federation stated:

The current HVNL [Heavy Vehicle National Law] is predominantly prescriptive, providing limited flexibility in terms of how the rules are applied and implemented. The ability to innovate via new technologies and methods can be restricted when an overly prescriptive approach is taken. This, in turn, can limit the adoption of improvements to safety and productivity. (sub. DR48, p. 11)

Governments can minimise the regulatory barriers that operators face in implementing innovative approaches. In this inquiry, the Commission has taken the approach that permitting innovation and flexibility is desirable, with the condition that flexible approaches should not reduce transport safety.

Balancing safety, productivity and other objectives

Managing transport safety risks has to be balanced against other objectives, such as economic activity and productivity in the transport sector and protecting health and the environment. Governments could reduce transport safety risks to very low levels by taking drastic actions (such as very low speed limits), but such measures would come at a high cost to economic activity and might have adverse environmental effects if they led to less efficient fuel use. Governments can achieve better outcomes for the community as a whole through careful consideration of the potential benefits and costs of a range of options.

The benefits and costs of transport safety regulation

Regulation can reduce the probability of a safety incident, reduce the harm caused by an incident and establish a ‘level playing field’ with respect to safety for competition in transport services. The costs of safety regulation include the costs to operators of complying

with regulation; the costs to government of administering regulation and the costs of foregone activity and innovation.

Some of the benefits and costs of regulation are clear, such as the costs of installing safety equipment or the benefits associated with reduced injuries and fatalities. Other effects of regulation are indirect, uncertain and more difficult to identify and assess, but also need to be taken into account when deciding whether to implement a change to safety regulation (box 2.2).

Box 2.2 Regulations can have unintended consequences

Regulations can cause changes in people's behaviour, sometimes leading to unintended consequences which are contrary to the intention of the regulation. One example is a proposal by the United States Federal Aviation Administration (US FAA) to require children under the age of 2 years to travel in child-restraint seats on commercial aeroplanes.

In its subsequent analysis, the US FAA found that if families were required to purchase an additional seat on an airline in order to travel with a child, some might choose to drive rather than fly. As driving is statistically much more dangerous than flying, this substitution would increase overall safety risks to families, with the US FAA estimating that the *airline* child-restraint seat requirement would result in between 13 and 42 more fatalities over 10 years in *highway* travel. As a result, the regulation was not introduced.

Source: US FAA (2005).

The distribution of benefits and costs of reform options is also important. Transport operators have diverse characteristics, capabilities and risk profiles. For some, transport is the core of their business, while for others (such as farmers who use heavy machinery) regulated transport activities are just one aspect of their operations. There is wide variation in size, from operators with a single truck or fishing boat through to large businesses that operate across all three modes. Changes to regulation that disproportionately affect smaller operators might have flow-on effects for competition, consumer choice and living standards in smaller communities. This is not a reason to reject reforms, but there could be a case for governments to assist with structural adjustment.

2.2 A 'tiered' model of transport safety regulation

Governments have evolved their approaches to transport safety regulation over time as technology and the transport task have changed and operators and regulators have become more sophisticated. Regulation is increasingly designed around an 'outcomes' framework that identifies the high-level goals of regulation. Regulators and regulated parties are encouraged to use a 'risk management' approach: identifying, evaluating and treating safety risks in a proportionate way, rather than having to comply with the strictly prescribed processes. This approach can meet community expectations for safety while recognising that transport operators have different capabilities to manage risks. Allowing operators to

identify effective, proportionate responses to the risks they face can lead to improved overall safety outcomes and can facilitate innovation.

Prescription and flexibility

The Australian Government guidelines for best practice regulation encourage policy makers to consider the complete range of policy options available to them when contemplating a change to regulation (including the ‘no change’ option) (Australian Government 2014). In transport safety regulation, one aspect of the policy makers’ choice is whether to take a prescriptive or flexible approach to regulation.

Outcomes and general duties in transport safety regulation

The foundations of any safety regulation — prescriptive or flexible — are:

- defined high-level outcomes — the effects on the community that the government is seeking to achieve
- duties for regulated parties to work towards that outcome and penalties for contravening those duties.

Governments have identified the outcomes they are seeking to achieve through transport safety regulation in ‘objects’ or ‘purposes’ clauses. For example, section 3 of the Rail Safety National Law (RSNL) states ‘[t]he main purpose of this Law is to provide for safe railway operations in Australia’.

The HVNL and Marine Safety National Law have comparable objects clauses. The Acts also establish duties for regulated parties. In rail safety, section 46 of the RSNL establishes duties for rail transport operators, ‘rail safety workers’, including drivers, signallers and other people who work with rolling stock, and persons who are involved in the construction and maintenance of rail infrastructure and rolling stock.

A duty imposed on a person under this Law to ensure, so far as is reasonably practicable, safety requires the person —

- (a) to eliminate risks to safety so far as is reasonably practicable; and
- (b) if it is not reasonably practicable to eliminate risks to safety, to minimise those risks so far as is reasonably practicable.

Sections 57–60 of the RSNL establish penalties (fines and/or imprisonment) for any party that has a duty and contravenes it. Again, the HVNL and Marine Safety National Law have similar clauses relating to duties and penalties.

Outcomes, duties and penalties are common to prescriptive and flexible approaches to regulation. Where the approaches diverge is in the way they require regulated parties to behave in order to fulfil their duties.

Prescriptive regulation

The prescriptive approach to regulation imposes specific requirements on the operations of regulated parties. An example is mass limits in the *Heavy Vehicle (Mass, Dimension and Loading) National Regulation 2018 (Qld)*. The regulations prescribe the maximum mass of various types of heavy vehicles, with penalties for operating over the prescribed mass.

Prescriptive approaches to regulation have advantages and disadvantages. Prescriptive regulation backed with strong enforcement can be effective in achieving specific objectives, which is particularly important for regulation affecting people's safety. Trade union participants in the inquiry stressed this argument for prescriptive regulation in their submissions. Prescription can also benefit operators by providing certainty about what they need to do to comply with regulation. The National Farmers' Federation observed that this is often the case for small operators.

Small operators — a category into which the majority of farmers fall — often find it easier and more efficient to be presented with a specific set of requirements with which they must comply. They simply want to know what measures they must put in place to ensure their operations are legal. The alternative — being required to develop their own risk management systems which satisfy HVNL rules and standards — can be complicated and time-consuming for small-scale operators. It also introduces a lack of certainty as to whether their actions are legal. (sub. DR48, p. 11)

Prescribed standards that apply to all operators can be a mechanism to achieve regulatory consistency. The Rail, Tram and Bus Union (sub. 10; sub. DR54) argued that prescriptive 'outer limit' regulations around fatigue management were necessary to achieve consistent rail safety regulation. The Maritime Union of Australia identified benefits to competition in this kind of consistency in the maritime sector.

The benefit of prescriptive regulation is that it sets a level commercial playing field for all involved. Shippers, vessel operators and crew all benefit from knowing that the vessel, safety, training and operational requirements are consistent for the same type of vessels and operations. (sub. 37, p. 16)

Prescriptive regulation can also be attractive for governments and regulators because it can reduce their risks of exposure to criticism (Regulation Taskforce 2006). For enforcement agencies, including regulators, police and workplace health and safety agencies, prescribed rules can be relatively simple to enforce. Enforcement officers can apply a single set of unambiguous rules, rather than having to be aware of the range of approaches to achieving an objective.

A downside of prescriptive regulation is that it limits options for flexibility and innovation. Operators that are required to use a particular technology or pattern of working might be able to achieve the same safety outcomes at lower cost if they had more flexibility. Firms facing prescribed standards have little opportunity to find better ways to manage safety risks and improve the efficiency of their business operations.

Prescriptive regulations that focus on subsidiary objectives can have consequences that clash with the overarching objective of managing safety risks (Banks 2003). Transport operators raised this with the Commission in the context of fatigue management regulations. Strict rules around working hours can reduce the risks of drivers being compromised by fatigue. However, they can also have unintended consequences, such as if a driver is forced to pull over on the side of the road to take a mandated rest break, rather than continuing for 30 minutes to a roadhouse where she could rest and recuperate more comfortably. Inquiry participants also pointed out that prescriptive fatigue management systems can be in conflict with animal welfare standards if drivers are required to take rest breaks at locations where animals cannot be provided with food, water and shade.

Prescription in regulation (and particularly when prescriptive standards are set out in legislation) tends to build in a bias towards maintaining the status quo. Changing legislation can be a slow process and delays can leave regulation lagging behind technological progress, leading to new and improved safety technologies not being permitted. Inquiry participants have cited the example of the HVNL, which includes extensive prescriptive standards that are enshrined in legislation. The HVNL is under review by the National Transport Commission, and inquiry participants have suggested that the next opportunity for reform to the legislation (including its voluminous prescriptive requirements) might not come for another 15 years.

Approaches that use more flexible instruments (such as standards and codes of practice) can be more responsive to changing circumstances.

Flexible approaches to regulation

A flexible approach to safety regulation involves:

- providing flexibility for regulated parties to identify effective and efficient ways to achieve an outcome
- publishing ‘acceptable means of compliance’ as a backstop for parties that do not want to identify bespoke approaches to compliance
- accreditation of people, practices and technologies that are effective in achieving safety outcomes
- allowing regulators to determine whether regulated parties are acting in accordance with their duties.

This approach is already established in rail safety regulation, and in aspects of heavy vehicle and domestic commercial vessel regulation. Compared with prescriptive approaches to regulation, it encourages regulated parties to manage the risks they face in ways that are effective and efficient. Operators must identify risks, evaluate them and identify technologies and ways of working to reduce the risks to acceptable levels. The flexible approaches must be as safe (or safer) than prescribed standards. Regulators focus on achieving the overarching outcomes rather than compliance with specific requirements.

Acceptable means of compliance

Participants in this inquiry emphasised the diversity among transport operators, technologies and tasks. Heavy vehicle owner-drivers have very different capabilities to large transport companies. Offshore commercial fishers face very different risks to tourist sightseeing boat operators. Mining companies that operate bulk transport rail lines in remote areas have more capacity to implement a risk management approach than the operators of tourist and heritage railways. To be effective, transport safety regulation should accommodate the capabilities and needs of all operators, technologies and tasks.

One approach to regulating a diverse group of operators is a ‘tiered’ system, whereby all operators are subject to overarching safety obligations and are permitted to choose how to achieve them. To assist the operators that do not have the capacity to develop bespoke safety management systems, regulators develop and maintain ‘acceptable means of compliance’ — work practices and technologies that are deemed to achieve the high-level safety objectives. These could be promulgated as regulations, standards, codes of practice or guidance notes — instruments that are easier to update than legislation.

A tiered approach permits transport operators to manage safety risks in the way that is most efficient for them, subject to a requirement to achieve a minimum acceptable level of safety. Flexibility would create space for productivity improvements, while the fall-back of ‘acceptable means of compliance’ would provide certainty for operators with less capacity for risk management.

Several participants in this inquiry supported a ‘tiered’ approach, including the National Farmers’ Federation (sub. DR48); the South Australian Freight Council (sub. DR46); and the Victorian Farmers’ Federation (sub. DR53).

Accreditation

One way for regulated parties to demonstrate compliance with their duties is by becoming accredited. Regulators (or designated agencies) grant accreditation to individuals, organisations, work practices and technologies that are effective in managing safety risks. (Regulated parties bear the cost of becoming accredited.) Examples of accreditation exist in the three modes of transport included in this inquiry.

- Domestic commercial vessel surveyors must be accredited by the Australian Maritime Safety Authority. Requirements for accreditation include qualifications, experience, insurance and membership of a professional association.
- Entities are not permitted to carry out rail transport operations unless they are accredited. In order to be accredited, the national rail safety regulator must be satisfied that an operator has the competence and capacity to manage risks and to implement a safety management system.
- Heavy vehicle operators can seek accreditation under the National Heavy Vehicle Accreditation Scheme for mass management, maintenance management and fatigue

management. Once accredited, operators are permitted to access concessions, such as carrying larger loads and bypassing some vehicle inspections.

Accredited operators have flexibility to achieve safety objectives in ways that give them scope to run their businesses more efficiently. Accreditation of systems can facilitate safety risk management practices that are appropriate to the vehicle, operator or activity, rather than applying ‘cookie cutter’ requirements to all operators and activities. Accreditation of transport technologies (such as through design standards) can permit operators to use the most up-to-date equipment, which might be safer and/or more operationally efficient.

Monitoring

Part of an effective flexible, system is ongoing monitoring of safety risks and outcomes to determine whether acceptable means of compliance and accreditation are achieving the required level of safety. Regulators are responsible for collecting, analysing and publishing information about safety incidents. Regulators should use the information to identify emerging risks and update their approach accordingly, and should be held accountable for the outcomes of their approach to regulation.

Risk-based enforcement

The way regulations are enforced can influence their effectiveness and the costs of administration (to government) and compliance (to regulated parties). Governments have finite resources and should target enforcement at the most serious risks.

A risk-based approach to enforcement involves setting priorities based on the likelihood of adverse outcomes and the potential seriousness of these outcomes. Regulators and enforcement agencies focus on identifying the risks that they need to manage, not the rules they have to enforce. Enforcement based on risk analysis provides regulators with a transparent, systematic and defensible framework of targeting the use of their limited resources and of focussing their compliance and enforcement activity to the areas of highest risk.

To take a risk-based approach to enforcement, regulators and enforcement agencies need a legislative framework that grants them flexible powers and discretion, such as the discretion to not enforce penalties for minor or initial breaches of regulations. Regulators also need data and the ability to analyse the risks associated with an activity. The Commission has made several recommendations relating to data and analytical capabilities in this report. Enforcement agencies might require additional training and resources to implement risk-based approaches to enforcement.

Regulatory review

With changes in technology and economic and social conditions over time, even well designed regulations can become less effective or unnecessarily costly, or may inhibit the adoption of newer and safer technology or practices (PC 2011, p. 18). Good regulatory practice includes incorporating a review process as part of the development of new regulatory proposals. Options include post-implementation reviews and sunset provisions that are written into legislation. Such reviews are likely to be particularly important where there is significant uncertainty about compliance burdens or the overall benefits to society.

As with risk-based enforcement, ongoing monitoring and review of the effects of regulation requires data. Effective data collection and analysis is an essential component of effective regulation.

3 Harmonising transport regulation

Key points

- Since federation, a variety of State, Territory and Commonwealth laws and regulations have applied to heavy vehicle, rail and domestic commercial vessel transport, in part reflecting the constitutional treatment of transport.
- The transport sector has long been subject to sector-specific safety regulation, in addition to Workplace Health and Safety laws, in each State and Territory.
- Since the 1990s, governments have sought to improve the national consistency of heavy vehicle, rail and domestic commercial vessel safety regulation, through incremental reforms.
- In 2008, under the Seamless National Economy National Partnership Agreement, the Council of Australian Governments (COAG) agreed to promote consistent national regulations across various sectors, including transport.
- In 2009, COAG agreed to create national regulatory regimes for rail safety, domestic commercial vessel safety, and heavy vehicle safety and productivity.
 - COAG’s aim was to improve safety while reducing costs and regulatory burdens on transport businesses, particularly those operating across State and Territory boundaries.
 - Three intergovernmental agreements were signed in 2011. This led to the establishment of national laws and national regulators for each mode of transport.
- The regulatory regimes governing the three transport modes vary, reflecting the history, challenges and complexities of regulation in each sector.
 - The Heavy Vehicle National Law is especially prescriptive, enshrining many specific requirements in legislation.
 - The Office of the National Rail Safety Regulator (ONRSR) uses a ‘co-regulatory’ approach, which allows operators to develop their own safety management systems, and shares the responsibility for managing safety risks between the regulator and industry. By contrast, the National Heavy Vehicle Regulator (NHVR) and the Australian Maritime Safety Authority (AMSA) rely mostly on ensuring operators comply with the rules and standards outlined in the national laws.
 - AMSA has a remit broader than the Marine Safety National Law while the functions of the NHVR and ONRSR are limited to the heavy vehicle and rail national laws.

In 2009, the Council of Australian Governments (COAG) agreed to create national regulatory regimes for rail safety, domestic commercial vessel safety, and heavy vehicle safety and productivity. This chapter provides a brief history of transport regulation reform in Australia before 2009 (section 3.1) and outlines the key elements of COAG’s 2009 national transport reforms (section 3.2).

3.1 History of transport regulation

From federation until the early 2010s, State and Territory governments were largely responsible for regulating heavy vehicles, rail and domestic commercial vessels, reflecting the division of powers in the Australian Constitution (box 3.1). Jurisdictions applied their own laws, with differing standards and scope.

Differing State and Territory regulatory regimes can be costly for businesses operating across jurisdictions. However, individual State and Territory regimes can also improve regulation by allowing for competitive federalism (House of Representatives Standing Committee on Legal and Constitutional Affairs 2006, p. 10).

Box 3.1 The constitutional foundations of transport regulation

The Australian Constitution confers an exclusive power to the Commonwealth to make laws concerning a limited range of areas (for example, defence, external affairs and corporations), while the States retain powers to make laws concerning any area where the Commonwealth does not have exclusive powers. The Constitution does not confer a general power on the Commonwealth to regulate transport. However, it does confer some specific legislative powers relating to transport. These specific powers, involving railways, include control of railways for military purposes, consensual acquisition of State railways, navigation, shipping and State-owned railways. In addition, some of the Commonwealth's exclusive powers may be indirectly related to transport, including the broad trade and commerce power.

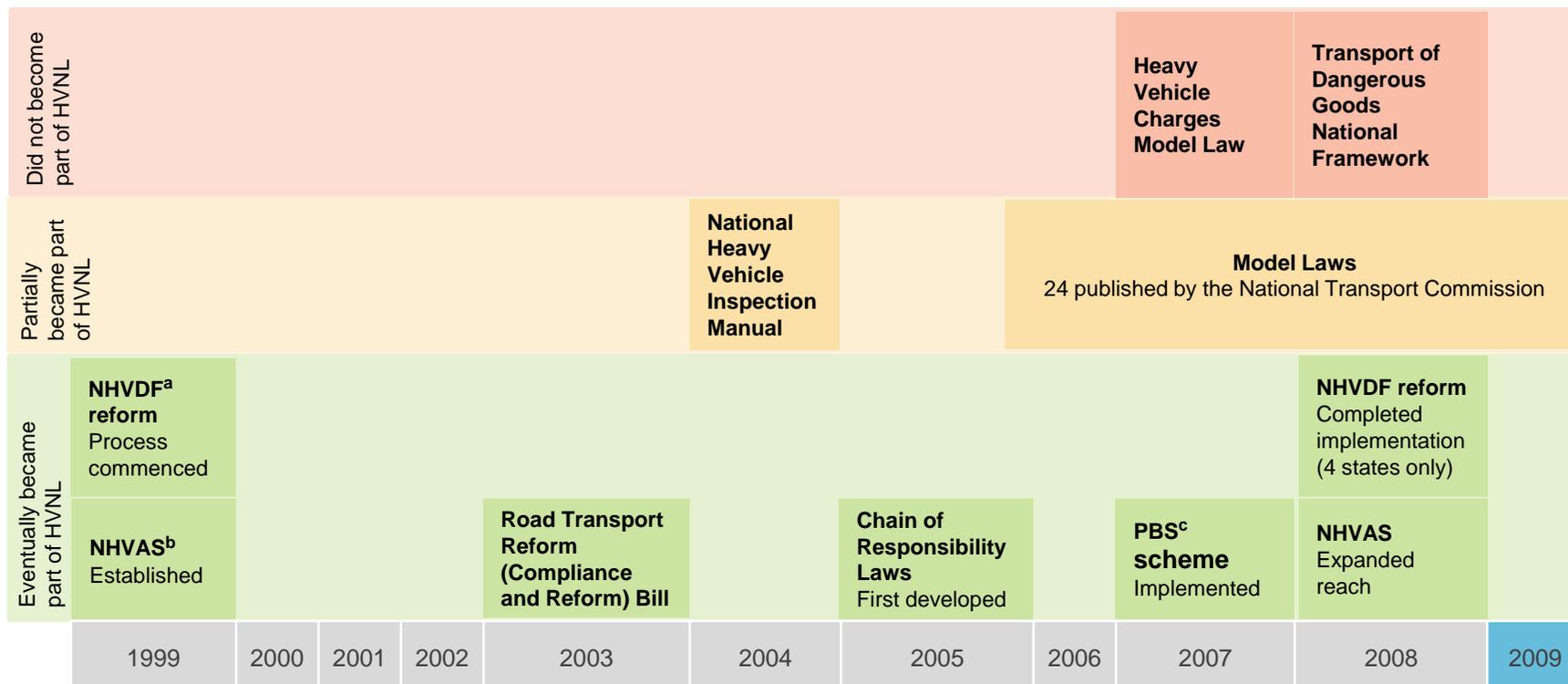
Australia's federal system poses unique challenges to regulatory reform. The distribution of powers has led to a mix of State, Territory and Commonwealth regulation of road and rail transport, and ports. These constitutional constraints affect the means by which regulatory change can occur, and the achievement of nationally consistent regulation (chapter 4).

From the late 1990s, governments sought to reduce the regulatory burden from multiple, disparate regimes by aligning some of the regulatory requirements in each jurisdiction. This period of harmonisation can be seen as a precursor to the COAG reforms of 2009 which led to the creation of a single, national regulatory regime for each sector (heavy vehicle safety and productivity, rail safety and domestic commercial vessel safety).

Heavy vehicle reforms before 2009

Governments made significant reforms to the regulation of safety in heavy vehicles in the decade before 2009. Several of these reforms produced programs which are now incorporated in the Heavy Vehicle National Law (HVNL) (figure 3.1).

Figure 3.1 A range of pre-2009 heavy vehicle reforms existed, many of which found their way into the HVNL



^a National Heavy Vehicle Driver Fatigue reform. ^b National Heavy Vehicle Accreditation Scheme. ^c Performance-Based Standards.

In 1999, the National Heavy Vehicle Accreditation Scheme (NHVAS) was established. The scheme provided operators with favourable mass and maintenance requirements in exchange for improved safety and other management systems. Fatigue management was added to the NHVAS in 2008. Accreditation allows operators to transport greater loads, omit some annual inspection requirements and have greater flexibility when managing fatigue risks. The scheme became part of the HVNL in 2013 and is administered by the National Heavy Vehicle Regulator (NHVR).

The National Heavy Vehicle Driver Fatigue reform process also commenced in 1999, following a Commonwealth parliamentary inquiry (HRSCCTA 1999). Recommendations from the inquiry included strengthening chain of responsibility regulation and creating more flexible regulation of driver hours through accreditation. The reform process was completed in 2008, albeit with only four States participating (New South Wales, Victoria, Queensland and South Australia). Elements of these reforms were carried over into the HVNL, including work diaries and general fatigue management.

In 2003, the National Road Transport Commission (now the National Transport Commission (NTC)) developed the *Road Transport Reform (Compliance and Enforcement) Bill 2003*. The objective was to provide a nationally consistent, and best practice legislative scheme. The Bill was never passed into law nationally but became the basis for future chain of responsibility laws.

Chain of Responsibility (CoR) laws were introduced in 2005. States and Territories amended their existing road safety and heavy vehicle legislation. All supply chain participants were now obliged to share the responsibility for ensuring breaches of safety regulation did not occur. CoR is now an element of the national law.

The National Heavy Vehicle Inspection Manual (NHVIM), introduced in 2004, was intended to provide nationally consistent procedures, standards and criteria for heavy vehicle inspections. Each criterion is now linked to a heavy vehicle standard in the national law, despite the NHVIM not being referenced in it directly. Most jurisdictions have adopted the NHVIM. However, some States (Queensland, South Australia and Tasmania) apply additional criteria and requirements, while the Northern Territory has not adopted some elements.

The Performance-Based Standards (PBS) scheme (discussed in chapter 7), now a part of the national law, was first considered in the late 1990s but not implemented until 2007. The PBS scheme was developed to improve approval processes for innovative and more productive vehicle designs, with the aim of facilitating greater access to local roads (NTC 2017).

Model laws were also developed from 2006 to 2009 by the NTC to provide for a coordinated approach to heavy vehicle regulation. These model laws covered oversize and overmass vehicles, heavy vehicle standards, driver fatigue (including driving hour regulations), and compliance and enforcement. The model laws were useful in facilitating COAG's national harmonisation agenda, and many were eventually included in the national law.

The HVNL has absorbed many, but not all, pre-2009 reform initiatives. For example, in 2007, the Australian Transport Council (now the Transport and Infrastructure Council (TIC)) launched a review into cost-reflective heavy vehicle pricing in response to the Productivity Commission inquiry into road and rail freight infrastructure pricing (PC 2006). The result was a model law on heavy vehicle charges, approved in 2007 by the Australian Transport Council, but not incorporated into the national law.

Similarly, while not part of the HVNL, since 2008, jurisdictions have, to varying degrees, adopted the national framework developed by the NTC for regulating the transport of dangerous goods (Deloitte Access Economics 2018). The Australian Code for the Transport of Dangerous Goods by road and rail is a key part of the framework, underpinned by model laws and regulations (Deloitte Access Economics 2018, p. 19; DIRDC 2018).

Rail reforms before 2009

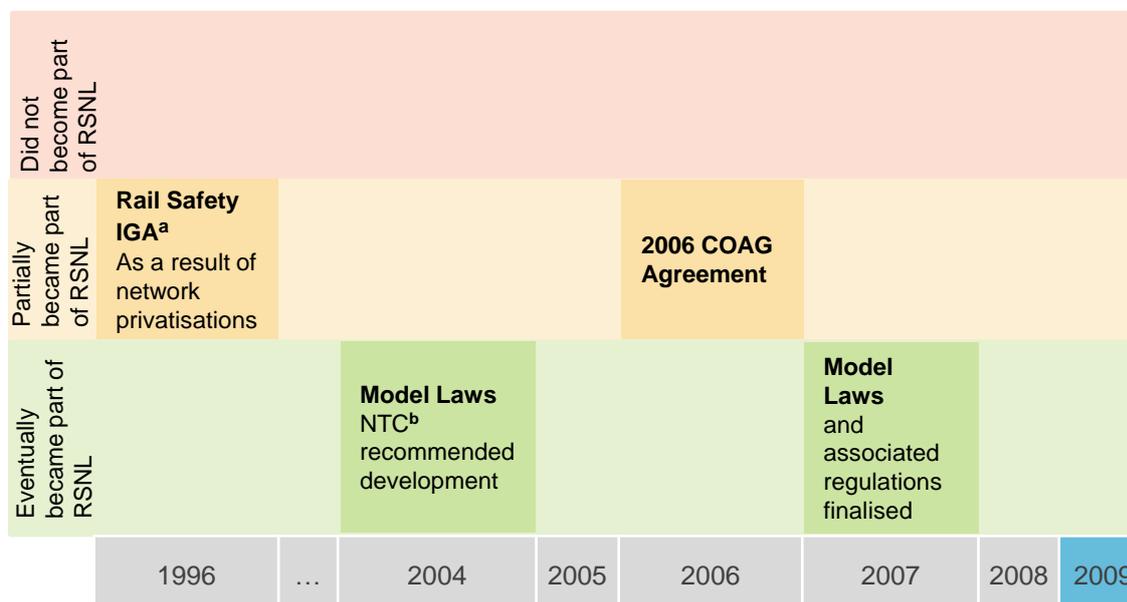
Movement toward a national system of rail safety regulation began in 1996, with the signing of a rail safety intergovernmental agreement. The agreement intended to establish a ‘cost-effective, nationally consistent approach to rail safety’ (NTC 2009, p. 8) by aligning State and Territory legislation and moving towards ‘more consistent guidance and the application of processes for risk and safety management systems’ (Webb 2009). Such systems are still in use today under the Rail Safety National Law (RSNL).

Though States and Territories all used safety management systems as their main accreditation tool, there were inconsistencies in approach and limits on interstate mutual recognition (PC 2000). This situation led the NTC to recommend the development of nationally consistent model legislation (model laws) (NTC 2004). These model laws were finalised in 2007, strengthening the existing accreditation process, and introducing General Safety Duties (for example, drug and alcohol, fatigue and health and fitness duties), compulsory interface agreements and a systematic hierarchy of regulatory sanctions. Although implemented inconsistently, these model laws helped to align rail safety regulation across jurisdictions and formed the basis of the final national law. Figure 3.2 sets out these key reforms and their incorporation into the RSNL.

While the model laws were being developed, COAG agreed to ‘harmonise and reform rail and road regulation within five years’ (COAG 2006, p. 6).

Before the 2009 COAG rail reforms, each State and Territory was responsible for developing and implementing its own rail safety regulatory regime, with each appointing its own regulator. The schemes across the jurisdictions were similar, due to the existence of partially implemented model laws.

Figure 3.2 Pre-2009 national rail reforms



^a Rail Safety Intergovernmental Agreement. ^b National Transport Commission.

Domestic commercial vessel reforms before 2009

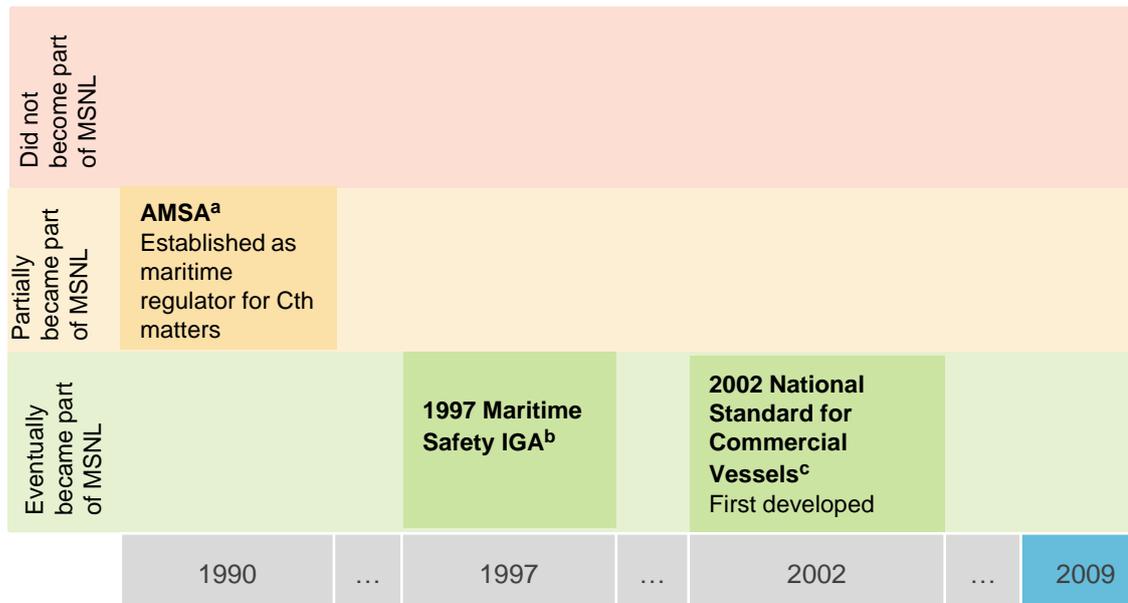
Unlike heavy vehicles and, to some extent, rail, harmonisation efforts of governments for domestic commercial vessel regulation were limited before the 2009 COAG agreements. The Australian Maritime Safety Authority (AMSA) was established as the Commonwealth’s maritime regulator in 1990, responsible for search and rescue, control of ship-sourced marine pollution, and safety regulation of maritime operations in Australia and of Australian ships operating overseas (*Navigation Act 2011* (Cwlth) vessels) (Australian Government 1990). State and Territory regulators were responsible for other maritime matters, mainly recreational vessels, and commercial vessels registered to only operate within Australian waters (domestic commercial vessels, for example, trading ships on interstate voyages, fishing vessels, pleasure craft and vessels on inland waterways (NAMSRS 2009, p. 6)). Figure 3.3 sets out these key reforms and their incorporation into the Marine Safety National Law (MSNL).

A 1997 intergovernmental agreement to establish a national marine safety regime was a significant early attempt at national reform. However, it was not successful in achieving uniform or consistent safety regulation standards and administration, due in part to the complex negotiation process involving differing jurisdictional priorities and the need for jurisdictions to approve and pass separate legislative instruments (NAMSRS 2009, p. 27).

In 2002, the Australian Transport Council (now TIC) endorsed a National Standard for Commercial Vessels (NSCV), providing ‘a common national standard for the design, construction, crewing and operation of vessels’ (Australian Transport Council 2002, p. 3). The NSCV was intended to be incorporated into the national regulator’s remit; it is now part

of the MSNL via subordinate legislation (the *Marine Safety (Domestic Commercial Vessel) National Law Amendment Bill 2014* (Cwlth)). Unlike heavy vehicles and rail, there were no ‘model laws’ in place for domestic commercial vessels.

Figure 3.3 **There were very few pre-2009 maritime safety reforms**



^a Australian Maritime Safety Authority. ^b Maritime Safety Intergovernmental Agreement. ^c Became part of the Marine Safety National Law via subordinate legislation.

The domestic commercial vessel sector was marked by major differences in:

... safety requirements, the recognition of vessel survey, safety certification and qualifications/certificates of crew, and considerable variations in the level and nature of ongoing monitoring of compliance with safety standards. (NAMSRS 2009, p. 7)

As noted by AMSA, the regulatory situation before the national system was:

... seven very different systems that were regulated, implemented, overseen and cost recovered across the entire spectrum of possibilities. (sub. 35, p. 4)

Regulatory differences between States and the Northern Territory extended to the definition of a (domestic) commercial vessel that would be subject to regulation (NAMSRS 2009, p. 48), and the mandatory nature of surveys. For example, Queensland had no annual survey requirements for the vessels likely to be subject to regulation, while the other States and the Northern Territory required annual surveys of vessels to some degree (with some exemptions and variations based on the length and categorisation of vessels) (NAMSRS 2009, Appendix C, Table 2d).

3.2 The 2009 COAG national transport reforms

In 2009, COAG agreed to create national regulatory regimes for heavy vehicle safety and productivity, rail safety and domestic commercial vessel safety. This involved replacing State and Territory laws and regulators with national laws and regulators in each of the three transport modes. COAG aimed to improve safety while reducing costs and regulatory burden for transport companies and, as a result, lowering costs of exports and trade (COAG 2009a). Intergovernmental agreements (IGAs) to this effect were signed in August 2011.

In 2008, COAG entered into a range of transport-related negotiations and agreements (box 3.2). The 2009 reforms were also part of a broader COAG reform agenda (box 3.3).

Box 3.2 COAG reforms leading to the 2009 transport reforms

In March 2008, the Council of Australian Governments (COAG) endorsed a broad reform agenda with the goals of boosting productivity, increasing workforce participation and geographic mobility, and delivering better services for the community. The reform agenda covered 27 areas of regulatory reform in areas of shared Commonwealth, State and Territory responsibility. One aim of this agenda was to promote consistent national regulations across various sectors, including transport.

In July 2008, COAG acknowledged that Australia's 'overlapping and inconsistent regulations' were impeding productivity growth and that continued domestic microeconomic reform was needed to enhance Australia's competitiveness and productivity. In response, COAG agreed to develop a reform package to 'deliver a seamless national economy', comprising of the 27 previously identified reform areas plus a variety of new priority areas for competition reform, including national transport policy, anti-dumping, parallel importation of books, rationalisation of occupational licences and further reforms to infrastructure access.

In December 2008, COAG signed the *National Partnership Agreement to Deliver a Seamless National Economy*. Under this, the Commonwealth, States and Territories agreed to work together 'to deliver more consistent regulation across jurisdictions and address unnecessary or poorly designed regulation, to reduce excessive compliance costs on business, restrictions on competition and distortions in the allocation of resources in the economy'. Governments identified uniform regulation of heavy vehicles, rail and domestic commercial vessel safety as key areas of reform. Despite the agreement formally ending on 31 December 2012, COAG maintained its commitment to implementing these reforms.

Sources: COAG (2008b, 2008a, 2008c).

Box 3.3 Other relevant COAG reforms since 2008

Other Council of Australian Governments (COAG) activities during this period focused broadly on infrastructure and on developing nationally-consistent regulation, including work on:

- road maintenance, rail projects and community infrastructure projects funded via national partnerships as part of the stimulus response to the Global Financial Crisis — the Nation Building and Jobs Plan (Feb–April 2009)
- better integrated infrastructure and land-use planning arrangements (national objective and planning criteria agreed to in Dec 2009)
- a road reform plan covering heavy vehicle pricing (considered most recently in 2013)
- a national ports strategy (2011).

COAG's agenda post-2013 has also covered:

- rationalisation of regulators (May 2014)
- a national partnership agreement on land transport infrastructure to 'support freight rail and road projects that help deliver a safe, sustainable and efficient national transport system' (October 2014)
- an intergovernmental agreement on Competition and Productivity Enhancing Reforms including efficient investment and usage of infrastructure for road transport (December 2016).

Sources: COAG (2009b, 2009c, 2011a, 2013, 2014a, 2014b, 2016).

Three intergovernmental agreements

The three relevant 2011 IGAs covered Heavy Vehicle Regulatory Reform (COAG 2011c), Rail Safety Regulation and Investigation Reform (COAG 2011d), and Commercial Vessel Safety Reform (COAG 2011b). The IGAs sought to create a national law for each mode of transport and establish national regulators to administer them. However, the IGAs had some differing objectives, intended outcomes and outputs (table 3.1).

The heavy vehicle IGA was intended to establish a uniform national regulatory system for all vehicles weighing more than 4.5 tonnes Gross Vehicle Mass or Aggregate Trailer Mass. Creating 'seamless' national regulation was expected to reduce regulatory burden on industry and improve safety, productivity and efficiency. The reforms were expected to be in place by the end of 2012. The IGA was signed by all COAG members, with the exception of Western Australia. Despite signing the IGA, the Northern Territory Government ultimately chose not to adopt the resulting national law and national regulator.

All COAG members signed the rail IGA and commercial vessel IGA. The rail IGA was intended to improve safety, reduce regulatory burden and improve productivity in the rail industry (COAG 2011d, p. 1). The commercial vessel IGA had a broader focus, with clauses including improving safety and decreasing risk to the public, industry and the environment, simplifying maritime safety requirements to increase certainty for industry, and reducing

costs by removing barriers to the movement of labour and domestic commercial vessels between jurisdictions.

Table 3.1 Key elements of COAG’s transport IGAs

	<i>Heavy Vehicle IGA</i>	<i>Rail IGA</i>	<i>Commercial Vessel IGA</i>
Signatories	All States and Territories except Western Australia ^a	All States and Territories	All States and Territories
Objectives	<ul style="list-style-type: none"> • Seamless national regulation • Consistent and streamlined administration and service provision of regulation 	<ul style="list-style-type: none"> • Seamless national safety regulation of rail operations • Improved rail safety 	<ul style="list-style-type: none"> • Safe operations with effective, consistent and efficient regulation • Minimisation of legal and administrative costs • No overall increase in regulatory burden
Intended outcomes	<ul style="list-style-type: none"> • Enhanced safety, productivity and efficiency • Removal of inefficiencies from inconsistent jurisdictional requirements • Reduced regulatory burden and compliance costs 	<ul style="list-style-type: none"> • Promotion of safety and safety improvement • Improved productivity and efficiencies from consistent national requirements • Decreased regulatory burden 	<ul style="list-style-type: none"> • Improved safety and lower public, industry and environmental risks • Reduced complexity and increased certainty regarding design, construction, equipment, operation and crew certification • Removal of inter-state barriers to transfer of labour and commercial vessels
Intended outputs	<ul style="list-style-type: none"> • A national law • An independent national regulator • National standards for delivery of regulatory services and activities • NHVR and Government service level agreements to support implementation 	<ul style="list-style-type: none"> • A national law • An independent national regulator • Expansion of the Australian Transport Safety Bureau’s role to cover rail safety investigations nationally 	<ul style="list-style-type: none"> • A national law • A national regulator • A consistently-applied national compliance and enforcement system • A national database of commercial vessels

^a The Northern Territory signed the Heavy Vehicle IGA but did not adopt the resulting national law. Western Australia neither signed the IGA nor adopted the national laws.

Sources: COAG (2011c, 2011d, 2011b).

Three national laws and regulators

The national laws established three national regulators through the creation of the National Heavy Vehicle Regulator (NHVR) and the Office of the National Rail Safety Regulator (ONRSR), and the expansion of the remit of the Australian Maritime Safety Authority (AMSA).

Although the laws and regulators were intended to be national in remit, there are various derogations (discussed in chapter 4). The effectiveness of the national regulators is analysed in chapter 5.

Heavy Vehicle National Law

The HVNL was passed by the Queensland Parliament (as host jurisdiction) in 2012, as a Schedule in the *Heavy Vehicle National Law Act 2012* (Qld). Other participating States and Territories then applied the law and its regulations via an ‘applied laws’ approach (chapter 4). South Australia chose to implement the HVNL via a ‘mirror’ approach (chapter 4). The HVNL came into force on 10 February 2014 (NHVR 2020).

The HVNL largely incorporated the pre-existing set of model laws⁶ developed by the NTC in consultation with governments and industry. These model laws had not been broadly adopted by States and Territories before the introduction of the HVNL. Some model laws, such as the transport of dangerous goods model law, were not incorporated into the HVNL.

The HVNL provides for national standards for heavy vehicles, and addresses a range of issues including driver fatigue, vehicle safety (via, for example, the Intelligent Access Program and the NHVAS), vehicle operations (including mass, dimension and loading) and road access arrangements (through relationships with road managers).

Western Australia and the Northern Territory did not apply the HVNL to their jurisdictions, and thus fall outside its coverage. However, Western Australia introduced its own road safety legislation in 2012 — the *Road Traffic (Vehicles) Act 2012* (WA). While the WA regime adopted many aspects of the HVNL, it is less prescriptive than the HVNL and differs in key respects, including vehicle accreditation, performance-based standards, fatigue management, and approaches to chain of responsibility. These differences require trucking operators traversing Western Australia’s borders to comply with at least two separate systems (the Western Australian system, and the HVNL and/or the Northern Territory system).

The Northern Territory has generally continued with a light-handed approach (for example, heavy vehicles can use all roads in the territory, with the exception of specified urban roads). In some instances, they have adopted aspects of the HVNL, including the heavy vehicle standards published in the NHVIM. The Northern Territory also offers flexibility to heavy vehicle operators by allowing operators to comply with their choice of the NT, WA or HVNL schemes (NT Government 2020).

⁶ Model laws are intended to provide the basis for nationally-consistent laws. They are not legally-binding until implemented by each individual jurisdiction.

National Heavy Vehicle Regulator and other institutions

The NHVR was established under the HVNL in 2013 and is responsible for the regulation of all vehicles under the scope of the HVNL in all States and Territories excluding Western Australia and the Northern Territory. The NHVR's responsibilities outlined in the HVNL Act include:

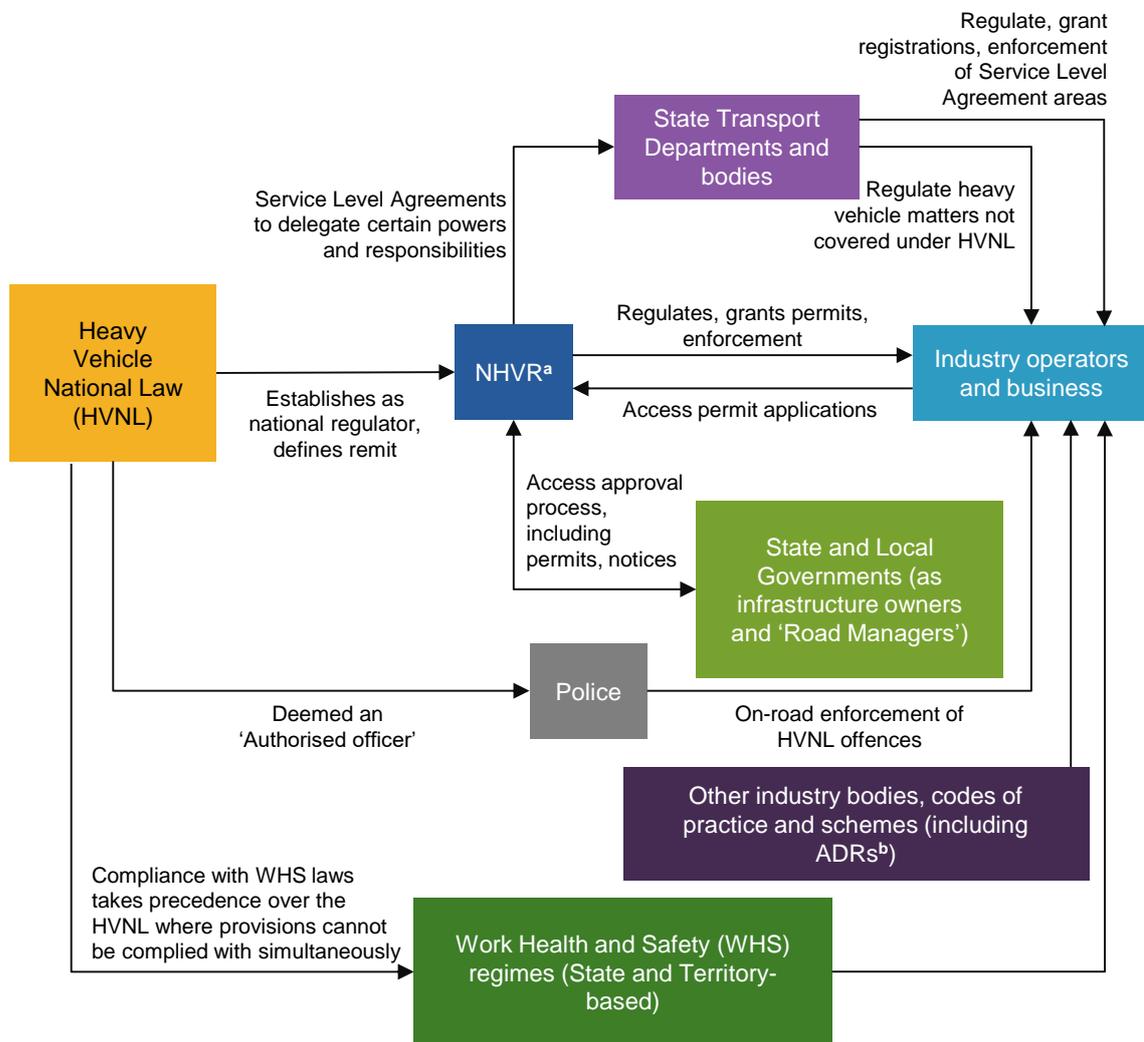
- administering and giving effect to the HVNL
- national coordination of heavy vehicle access
- implementing and managing an audit program for heavy vehicle accreditation
- compliance and enforcement, including reviews and appeals
- monitoring and reviewing the operation of the HVNL
- keeping a database of heavy vehicles
- identifying and promoting best practice methods for compliance, managing risks to public safety and the productive and efficient transport of goods or passengers.

The NHVR does not operate in isolation; many bodies and relationships work together within the heavy vehicle regulatory framework (figure 3.4). Notably, Work Health and Safety (WHS) laws are enforced alongside the HVNL and tend to take the approach of requiring duty holders to eliminate or minimise risk generally. A similar, duty-based approach is also incorporated in the HVNL's Chain of Responsibility laws.

Rail Safety National Law

The RSNL was passed by the South Australian Parliament (as host jurisdiction) in 2012, as a Schedule in the *Rail Safety National Law (South Australia) Act 2012* (SA). Other States and Territories then applied the law and its regulations in their jurisdictions via an applied laws approach, except for Western Australia which opted to 'mirror' the national legislation rather than apply the South Australian version (chapter 4). States and Territories progressively adopted legislation empowering the South Australian Act in their jurisdictions from October 2012 (New South Wales, Tasmania and the Northern Territory), April 2013 (Victoria), May 2014 (ACT) and February 2017 (Queensland). The RSNL came into force in January 2013 for the first participating States (New South Wales, South Australia, Tasmania and the Northern Territory).

Figure 3.4 Bodies and relationships involved in heavy vehicle regulation



^a National Heavy Vehicle Regulator. ^b Australian Design Rules.

Before the introduction of the RSNL, rail safety was regulated by seven rail safety Acts and associated regulations (ONRSR, sub. DR68, p. 7). As stated by the NTC in its 2014 National Transport Reform Implementation Monitoring Report:

The intention of a single national law [was] to replace 46 pieces of state, territory and Commonwealth law and establish the National Rail Safety Regulator. Establishing a single national regulator [was] intended to replace seven separate regulatory authorities. (2014, p. 18)

The RSNL also extends the role of the Australian Transport Safety Bureau to become the national rail safety investigator (NTC 2014, p. 18), and sets out the duties of parties involved in rail, including operators, manufacturers, persons loading and unloading freight, officers, and rail safety workers. It also provides guidance on the development of safety management systems, and addresses rail safety information and investigation.

Office of the National Rail Safety Regulator and other institutions

ONRSR was established under the RSNL and commenced operation in 2013. ONRSR regulates above and below rail operations, as well as rail equipment manufacturing in all States and Territories. ONRSR's main functions include:

- administering the RSNL
- administering a national accreditation scheme for operators and infrastructure managers
- monitoring the implementation of operators' safety management systems and their safety performance (under a co-regulatory regime)
- undertaking compliance investigations and making enforcement decisions.

Though ONRSR is the sole national regulator for rail safety, many bodies and relationships contribute to the regulatory regime (figure 3.5). State and Territory WHS laws are enforced alongside the RSNL. Both systems require duty holders to eliminate or minimise risk generally. Memoranda of understanding between ONRSR and the various WHS regulators promote a 'collaborative approach to the administration of rail safety and WHS regulation' (ONRSR 2019).

Marine Safety National Law

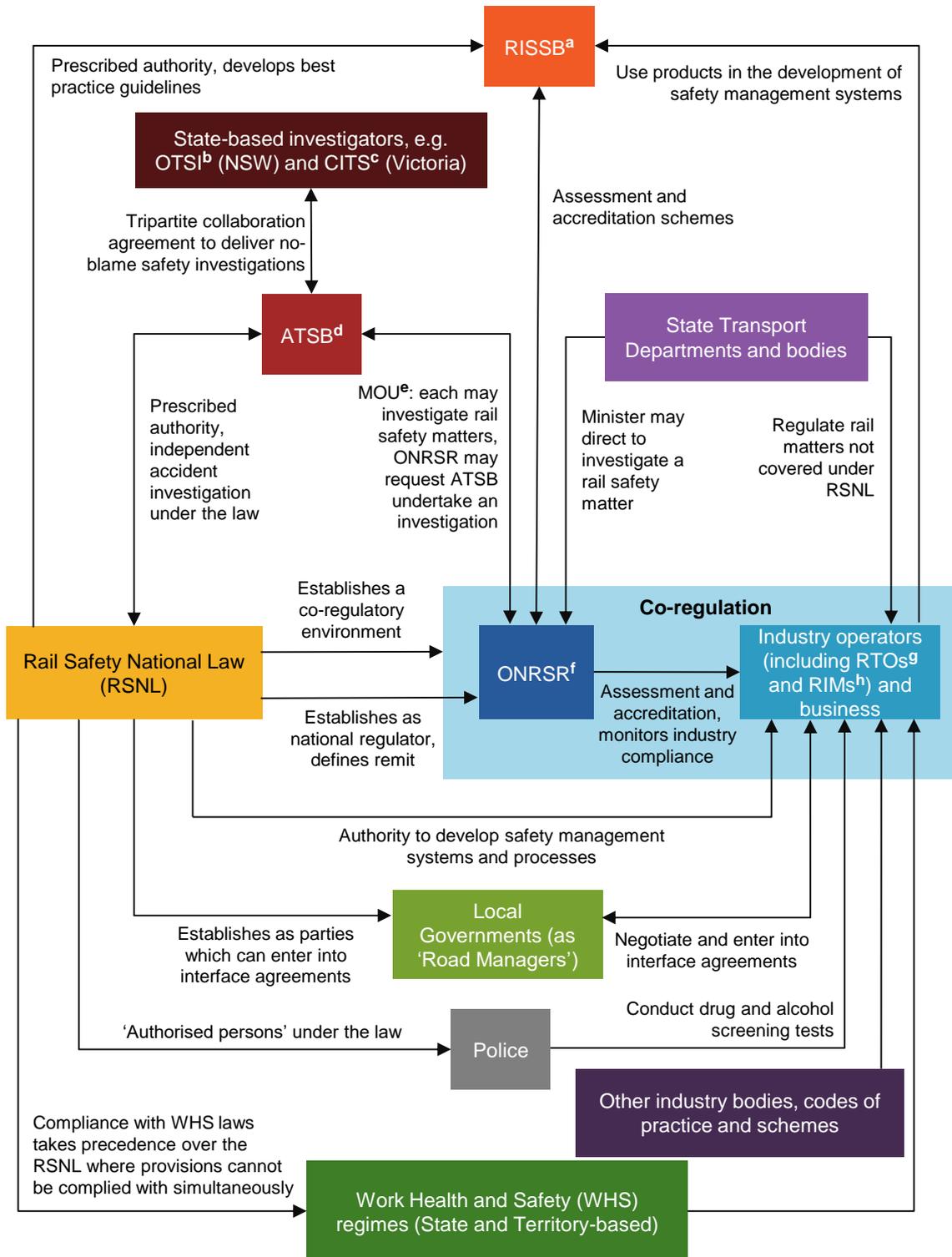
The MSNL was passed by the Commonwealth Parliament in 2013 as a Schedule in the *Marine Safety (Domestic Commercial Vessel) National Law Act 2012* (Cwlth), on behalf of all jurisdictions. However, jurisdictions were required to pass 'Application Acts' to fill any gaps in the Commonwealth's law-making power (COAG 2011b, p. 11). All jurisdictions have passed Application Acts bar Western Australia⁷.

The MSNL replaced eight Federal, State and Territory laws with a single framework for the certification, construction, equipment design, operation and administration of domestic commercial vessels and seafarer qualifications in Australian waters.

The MSNL covers the safety duties of the parties involved in domestic commercial vessels, the powers and obligations of safety inspectors, the identification and certification of vessels and seafarers, and general incident reporting. Regulations have also prescribed processes to allow vessels operating before the law's introduction to continue operating under the design, construction and survey requirements applying before the introduction of the new national system (chapter 4).

⁷ Despite not passing an Application Act, the MSNL continues to apply in Western Australia, and Western Australia has transferred regulatory powers to the national regulator.

Figure 3.5 Bodies and relationships involved in rail safety regulation



^a Rail Industry Safety and Standards Board. ^b Office of Transport Safety Investigations. ^c Chief Investigator Transport Safety. ^d Australian Transport Safety Bureau. ^e Memorandum of Understanding. ^f Office of the National Rail Safety Regulator. ^g Rail transport operators. ^h Rail infrastructure managers.

Australian Maritime Safety Authority and other institutions

The MSNL expanded AMSA's remit to include domestic commercial vessels.

At the commencement of the MSNL, AMSA was responsible for its regulation but delegated service delivery to the States and Territories (AMSA, sub. 35, pp. 3, 6). In 2014, following a review of the national system, Commonwealth, State and Territory transport ministers agreed that AMSA should take full regulatory responsibility (including full service delivery) for the MSNL from States and Territories by 1 July 2017. However, in November 2016, this deadline was extended to 1 July 2018, to better allow jurisdictions and industry to consult and prepare for the changes (MIAL, sub. 14, p. 2). AMSA eventually assumed full responsibility for the regulation of domestic commercial vessels in all States and Territories in July 2018.

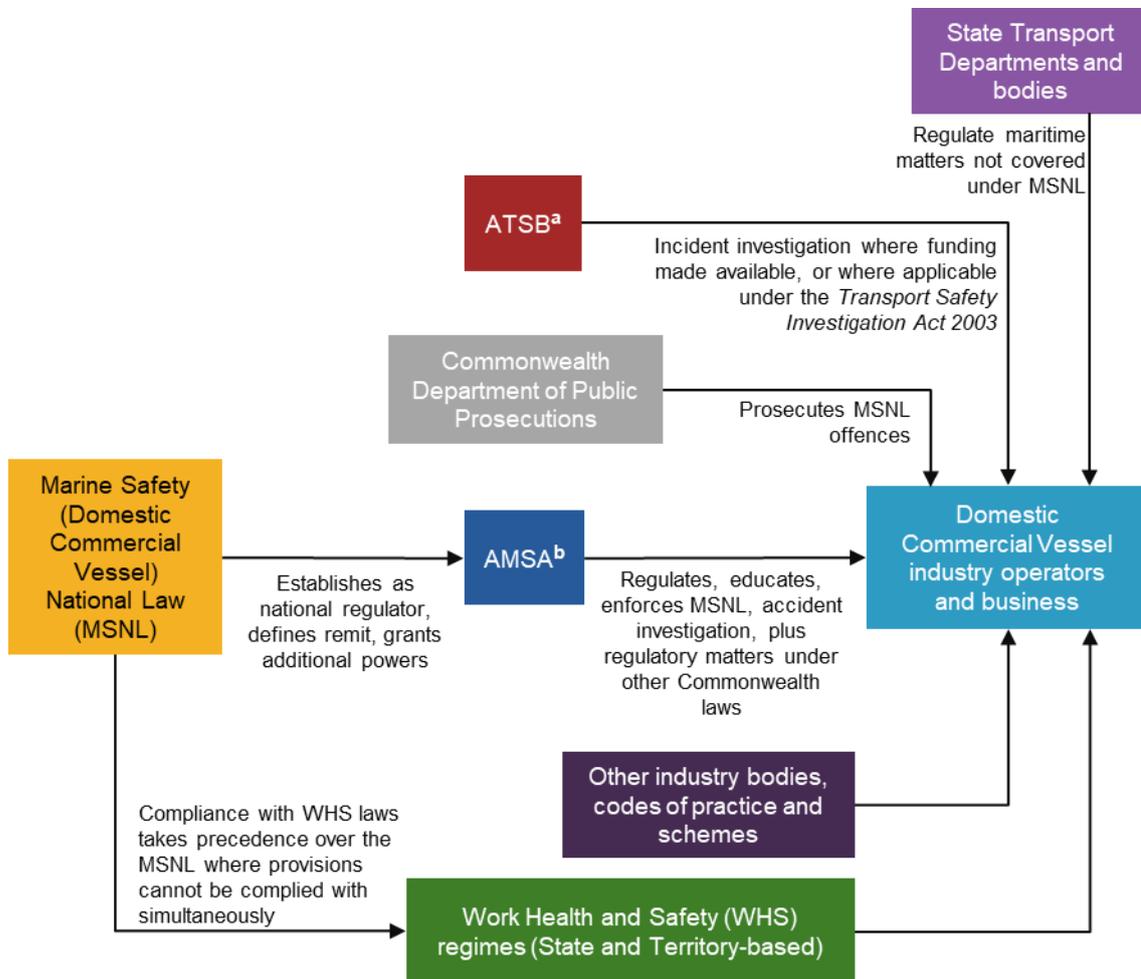
AMSA also regulates other vessels operating in Australian waters under separate legislation (for example, foreign vessels, defence vessels and regulated Australian vessels under the *Navigation Act 2012* (Cwlth)). Some of AMSA's main functions include:

- giving effect to the MSNL
- combatting pollution in the marine environment
- providing search and rescue services
- providing services to the maritime industry on a commercial basis, on request (AMSA 2019).

While AMSA has the principal responsibility (amongst its other functions) to regulate domestic commercial vessels, other bodies and relationships are present in the regulatory framework (figure 3.6).

Similar to other modes of transport, WHS laws are enforced alongside the national safety law, generally taking the approach of requiring duty holders to eliminate or minimise risk. While memoranda of understanding exist between AMSA and various WHS regulators, those agreements are not exhaustive in their description of the jurisdiction of each regime, noting that jurisdiction may be decided on a case by case basis, and that joint investigation of some incidents may be required.

Figure 3.6 **Bodies and relationships involved in domestic commercial vessel regulation**



^a Australian Transport Safety Bureau. ^b Australian Maritime Safety Authority.

Differences between the regulatory regimes

Some key differences exist between the regulatory regimes governing the three transport modes covered by the COAG national transport reforms.

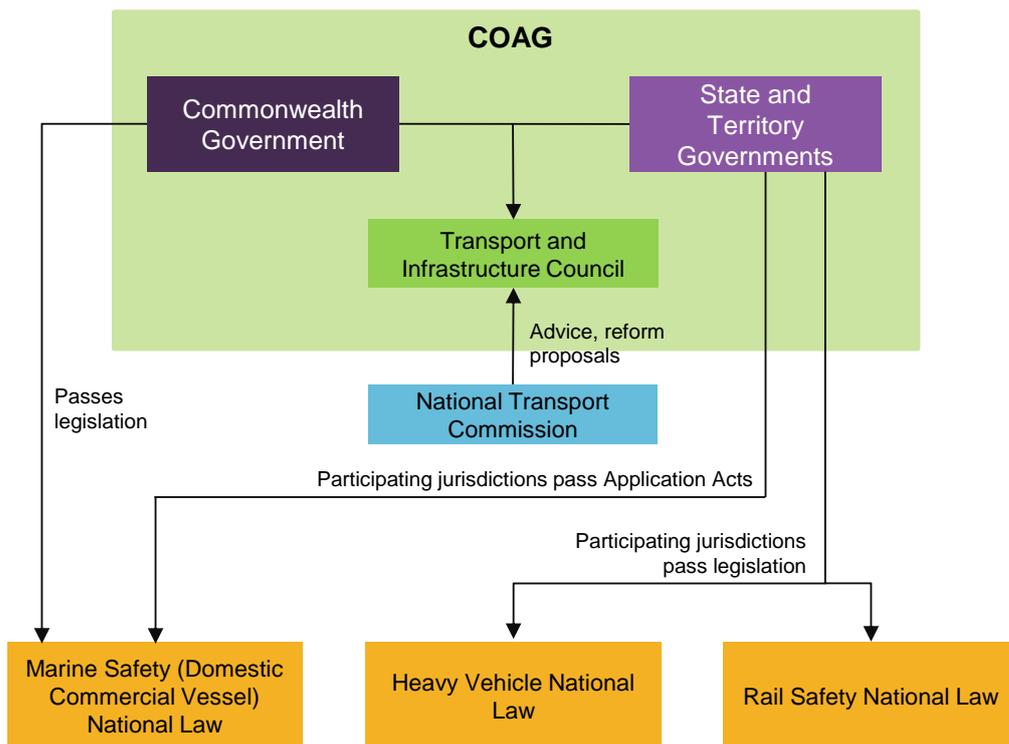
- In the regulation of *heavy vehicles*, the HVNL is relatively prescriptive, while the rail and maritime national laws reflect a more risk-based approach (chapter 6).
- In the regulation of *rail*, ONRSR operates using a ‘co-regulatory’ approach. This allows operators to develop their own safety management systems, sharing responsibility for managing safety risks between ONRSR and key parties, including governments, operators and industry groups. In contrast, the NHVR and AMSA rely mostly on ensuring operators comply with the rules and standards outlined in the national laws

- In *maritime* regulation, AMSA’s remit extends beyond the MSNL, while the functions and responsibilities of both the NHVR and ONRSR are limited to the national laws. For example, AMSA functions external to the MSNL include the provision of search and rescue services, combatting marine pollution, and various regulatory functions covering international commercial vessels under the *Navigation Act 2012* (Cwlth).

The national regulators have differing funding and cost recovery arrangements (chapter 10).

There are also differences in how the national laws are legislated (figure 3.7), potentially giving rise to marginally different institutional dynamics. Namely, while the MSNL may be subject to similar advice from the Transport and Infrastructure Council and agreement by COAG members, it is legislated at the Commonwealth level, while the HVNL and MSNL are legislated at the state level.

Figure 3.7 The three national laws were not created in the same way
Processes involved in heavy vehicle, rail and maritime regulation



4 Is transport safety regulation nationally consistent?

Key points

- The Council of Australian Governments (COAG) sought to harmonise transport safety regulation to facilitate interstate operations and reduce costs.
- Governments have made significant progress in harmonising transport safety regulation. The Australian, State and Territory governments have enacted national laws and established national regulators for heavy vehicles, rail and domestic commercial vessels.
- Some aspects of implementation were delayed.
 - Rail safety reforms were achieved largely in line with agreed timelines and the Office of the National Rail Safety Regulator (ONRSR) now has full direct regulatory responsibility for the Rail Safety National Law (RSNL).
 - The implementation of the Heavy Vehicle National Law (HVNL) and the National Heavy Vehicle Regulator (NHVR) took longer than the set timelines. The NHVR will not have full direct regulatory responsibility until at least 2021.
 - The Australian Maritime Safety Authority (AMSA) was to take on full responsibility for regulatory service delivery for domestic commercial vessels in 2017. This was pushed back to 2018.
- Significant differences between State and Territory approaches to transport safety regulation have persisted beyond the implementation of the national systems, especially in heavy vehicle regulation.
 - Western Australia and the Northern Territory have not implemented the HVNL.
 - States and Territories derogate from the HVNL and RSNL. Some derogations are administrative and have little material effect. Others are significant departures from the national laws that undermine consistency and impose costs. COAG members should commit to removing any significant derogations from the national law which are not based on sound evidence.
 - The ‘mirror legislation’ approach taken by Western Australia in rail has led to lags of up to two years in enacting RSNL amendments.
- There is also inconsistent application of national laws across participating jurisdictions.
 - The extensive use of grandfathering in the maritime sector means many vessels are regulated according to old State and Territory requirements rather than the latest (national) standards.
 - Service-level agreements have led to some inconsistency in the application of the laws.
 - Differences in engineering standards and rail network standards and operating rules lead to situations where above-rail operators experience inconsistent requirements when traversing different track networks.

4.1 Introduction

The Council of Australian Governments (COAG) envisaged that harmonising the regulation of heavy vehicle, rail and maritime transport would reduce ‘costs incurred by business in complying with unnecessary and inconsistent regulation across jurisdictions’ (COAG 2008, p. 4), while improving safety. Ten years after the initial COAG Agreement, the vision of consistent national regulatory regimes has not been fully achieved.

This chapter describes the scale of the harmonisation task in heavy vehicle, rail, and domestic commercial vessel transport (section 4.2), and the implementation of those reforms (section 4.3). It then sets out the Commission’s assessment of the degree of consistency in legislation and regulation (section 4.4), and consistency in the application of the law (section 4.5).

4.2 The harmonisation task in transport

Replacing State and Territory laws with national laws has been a long, complex task requiring negotiation and compromise. This has been in part due to the significant differences in State and Territory regulations before 2009. Harmonisation can take different forms with different effects (figure 4.1).

Different starting points in each mode

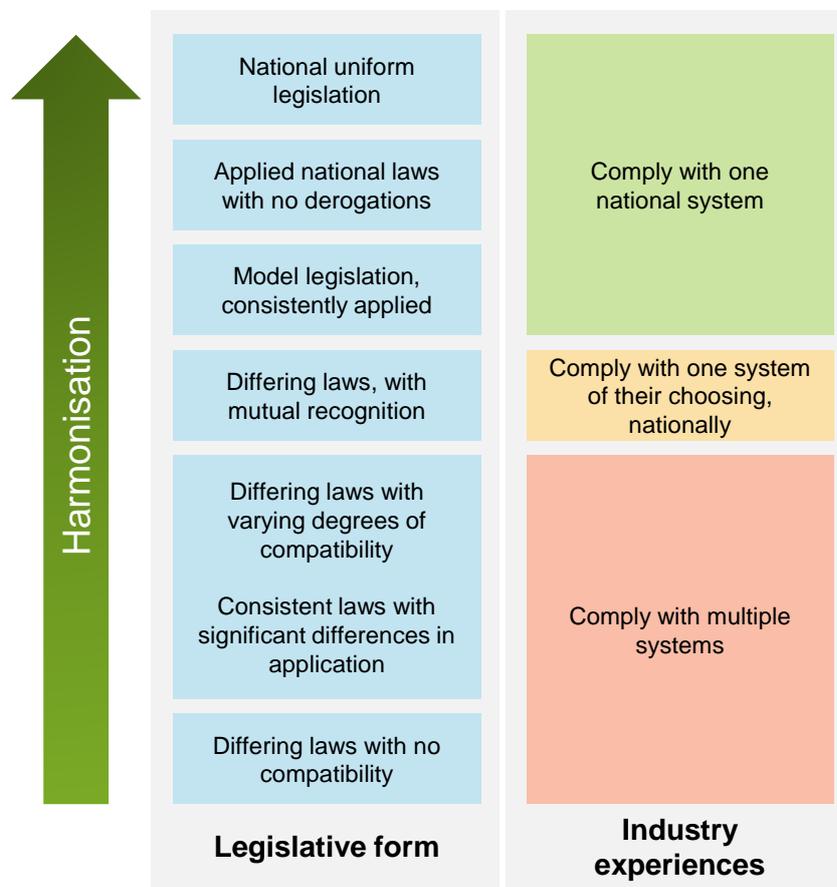
Safety regulation applying to the three modes of transport were at different stages of harmonisation before 2009 (chapter 3). Before 2009, non-binding model laws and regulations existed for heavy vehicle and rail regulation (NTC 2011, p. 5). These model laws were not fully implemented in all jurisdictions, but provided the foundations for the Heavy Vehicle National Law (HVNL) and Rail Safety National Law (RSNL).

No model laws existed for domestic commercial vessels, and limited cross-jurisdictional harmonisation occurred before 2009, leading to ‘vastly different and inconsistent requirements across the country’ (MIAL, sub. 14, p. 1).

Negotiating national laws

Developing and implementing national regimes has depended on continuing support from States and Territories. Signing the three intergovernmental agreements (IGAs) was a first step towards harmonisation, but did not compel jurisdictions to enact the national laws (COAG 2011a, para. 8, 2011c, para. 8, 2011b, para. 7) — the Northern Territory signed the heavy vehicle IGA, but later decided to opt out. Jurisdictions are also free to vary the application of the national law, although there is an expectation that any changes would be agreed to be the COAG Ministerial Council.

Figure 4.1 **Degrees of harmonisation**



The implementation of national regulation in rail has been relatively smooth, compared to heavy vehicles and domestic commercial vessels. In heavy vehicle regulation, State and Territory government negotiations continue, years after the signing of the heavy vehicle IGA. Jurisdictions continue to negotiate on the terms under which they will transfer regulatory services under the HVNL to the National Heavy Vehicle Regulator (NHVR). Negotiations between the NHVR and the New South Wales and Queensland Governments are at different stages with different anticipated agreement dates (NHVR 2020b).

In the case of domestic commercial vessels, COAG members continue to negotiate the resourcing of the national scheme and cost-recovery arrangements for the national regulator. When the Australian Maritime Safety Authority (AMSA) assumed full service delivery and regulatory responsibility for domestic commercial vessels in July 2018, the Australian Government decided to provide additional funding to delay the previously proposed cost-recovery measures by three years to 2021 pending a review (MIAL, sub. 14, p. 3; AMSA, sub. 35, p. 15). This delay was due to a lack of agreement between governments and uncertainty about the actual costs of service delivery.

The incremental approach to implementing the national laws was probably necessary to secure agreement from the States and Territories to move toward national regulation. Achieving agreement among the States and Territories on the details of the intended laws before the IGAs were signed would have taken significantly more time and negotiation. Anecdotally, the Commission has heard that this may well have prevented the national laws from being established in the first place.

4.3 Moving towards national regulation

The implementation of national laws and regulators has been delayed against most of the indicators that the jurisdictions agreed to in the IGAs (figure 4.2). Host jurisdictions passed the national laws in 2012, but full implementation in participating jurisdictions did not occur until much later — and in some cases is still not complete (figures 4.3–4.5).

- In heavy vehicles, the process will not be complete until 2021 at the earliest, when New South Wales and Queensland are expected to have handed over all responsibility for regulatory activities to the NHVR. (Western Australia and Northern Territory have given no indication that they intend to join the national system.)
- Full implementation of the national rail safety regulatory regime was complete as of 2 December 2019, with the termination of the last remaining service-level agreement between Transport Safety Victoria and the Office of the National Rail Safety Regulator (ONRSR).
- In the case of maritime regulation, Western Australia is still to enact an Application Act to apply the Marine Safety National Law (MSNL) in its jurisdiction, though it has agreed to in principle, with AMSA taking over regulatory responsibility for most services (AMSA 2020).

FINDING 4.1 – IMPLEMENTATION OF THE NATIONAL SYSTEMS IS LARGELY COMPLETE

While implementation has been slower than expected, national regulation and national regulators for heavy vehicles, rail and domestic commercial vessels are now largely established.

Figure 4.2 Many key performance indicators were achieved late^a

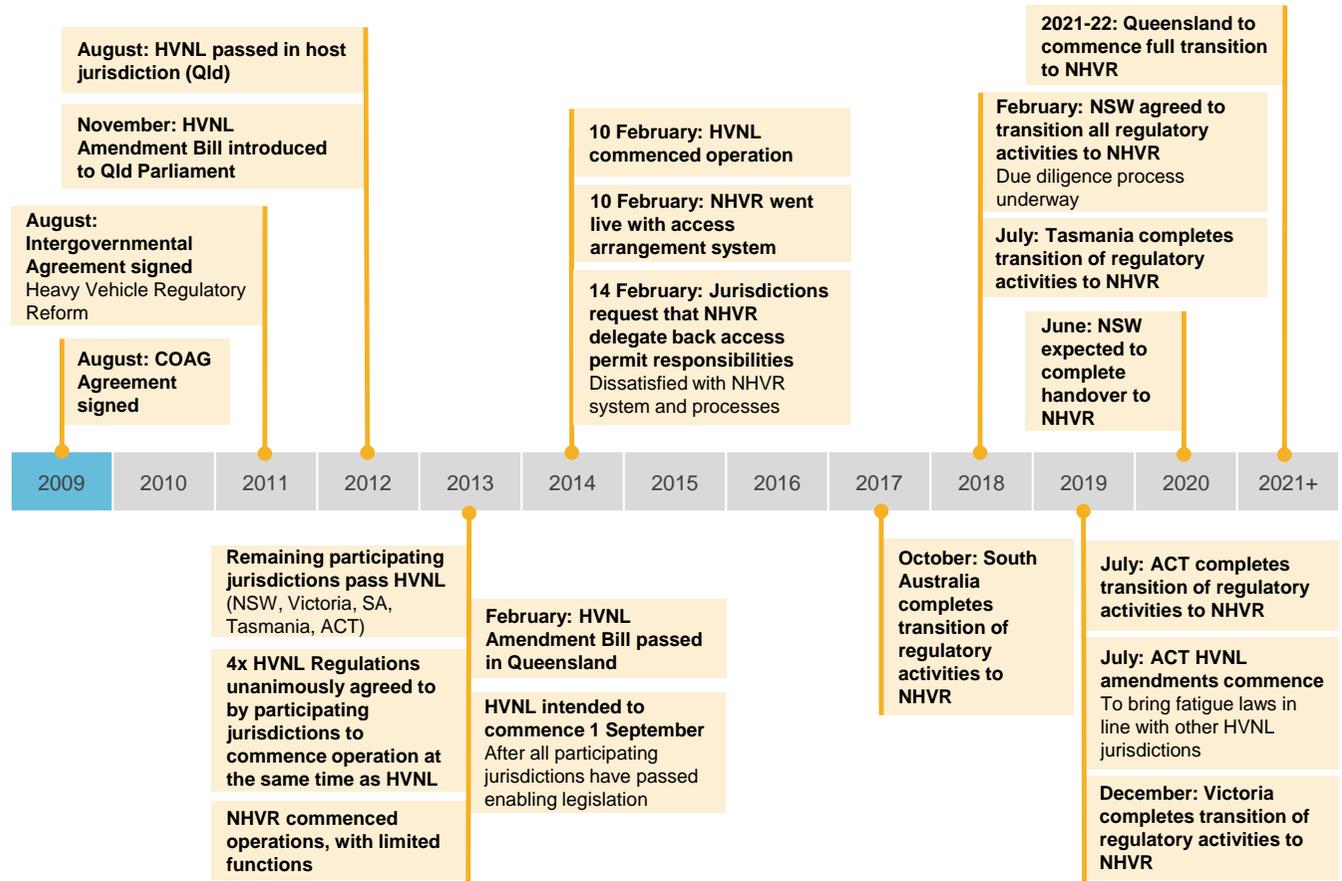
	Performance indicator	Agreed completion date	Actual completion date
	Performance indicators and deadlines from IGA		
	National law introduced into Qld Parliament	End October 2011	Mid November 2011
	National law passed by Qld Parliament	End March 2012	August 2012
	States and Territories introduce and pass enabling legislation	End October 2012	2013
	NHVR established	December 2012	January 2013
	NHVR operational	End December 2012	2014
	Performance indicators and deadlines from IGA		
	National law and regulations drafted	November 2011	November 2011
	National law introduced into SA Parliament	March 2012	March 2012
	National law passed by SA Parliament	May 2012	May 2012
	States and Territories pass enabling legislation	December 2012	October 2012 to February 2017
	ONRSR established and operational	Beginning January 2013	Beginning January 2013
	National investigation arrangements commence	Beginning January 2013	April 2013
	Performance indicators and deadlines from non-IGA sources		
	National System for commercial vessel safety commenced	Beginning January 2013	Beginning July 2013
	A single national regulator for commercial vessel safety	Beginning January 2013	Not in full effect until July 2018
	AMSA takes over full regulatory responsibility from States and Territories	July 2017	July 2018
	States and Territories introduce and pass Application legislation	~July 2013 ^b	2012 to 2016 ^c

^a Green: deadline met, Yellow: deadline partially met on time/ short overrun, Red: significant overrun.

^b About 6 months after Commonwealth Act passed, similar to road and rail. ^c Excludes WA, which is still to introduce Application legislation.

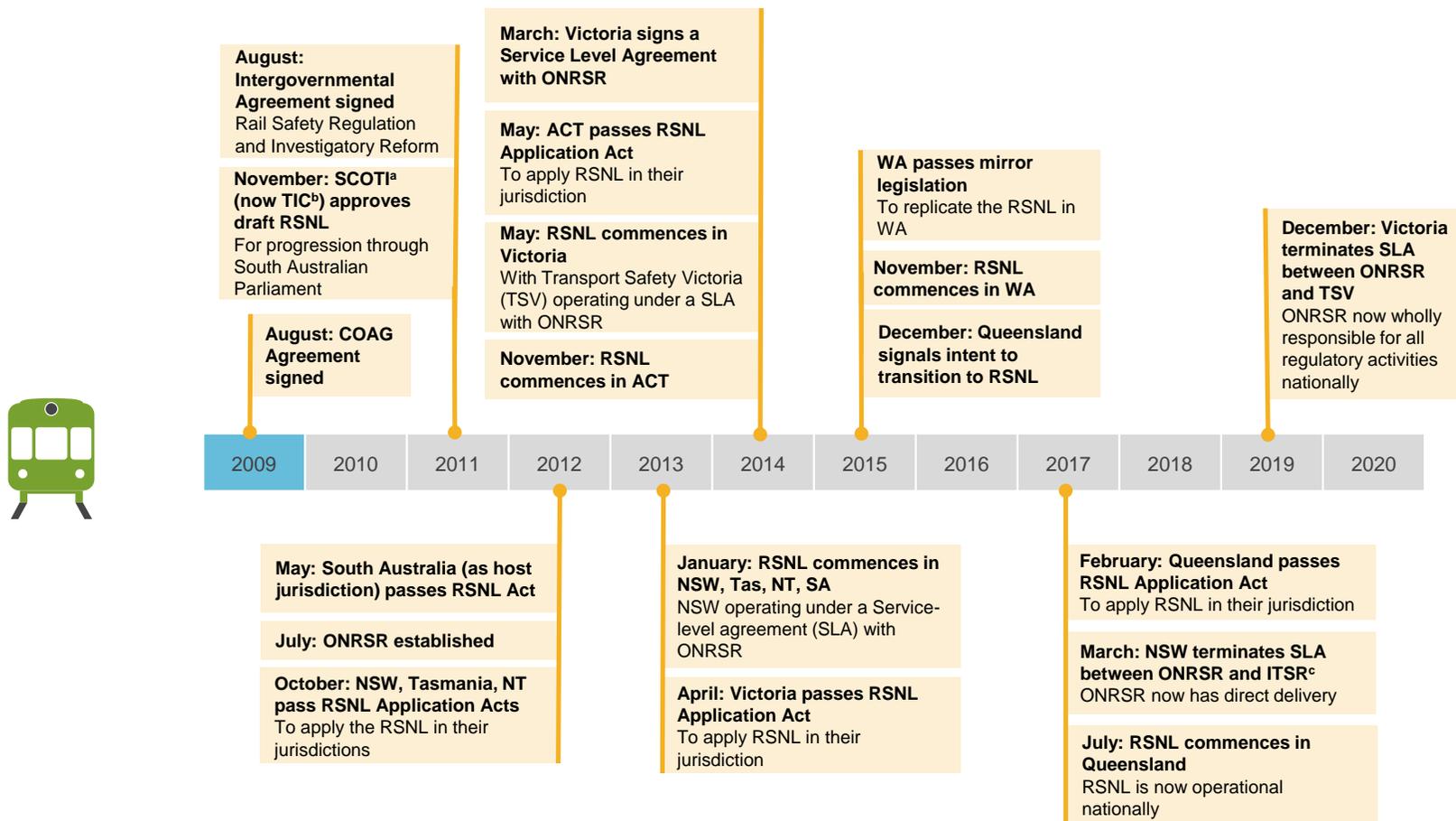
Sources: COAG (2011c, 2011b, 2011a); State and Territory national law legislation; MIAL (sub. 14, p. 2).

Figure 4.3 A convoluted implementation of the HVNL and NHVR



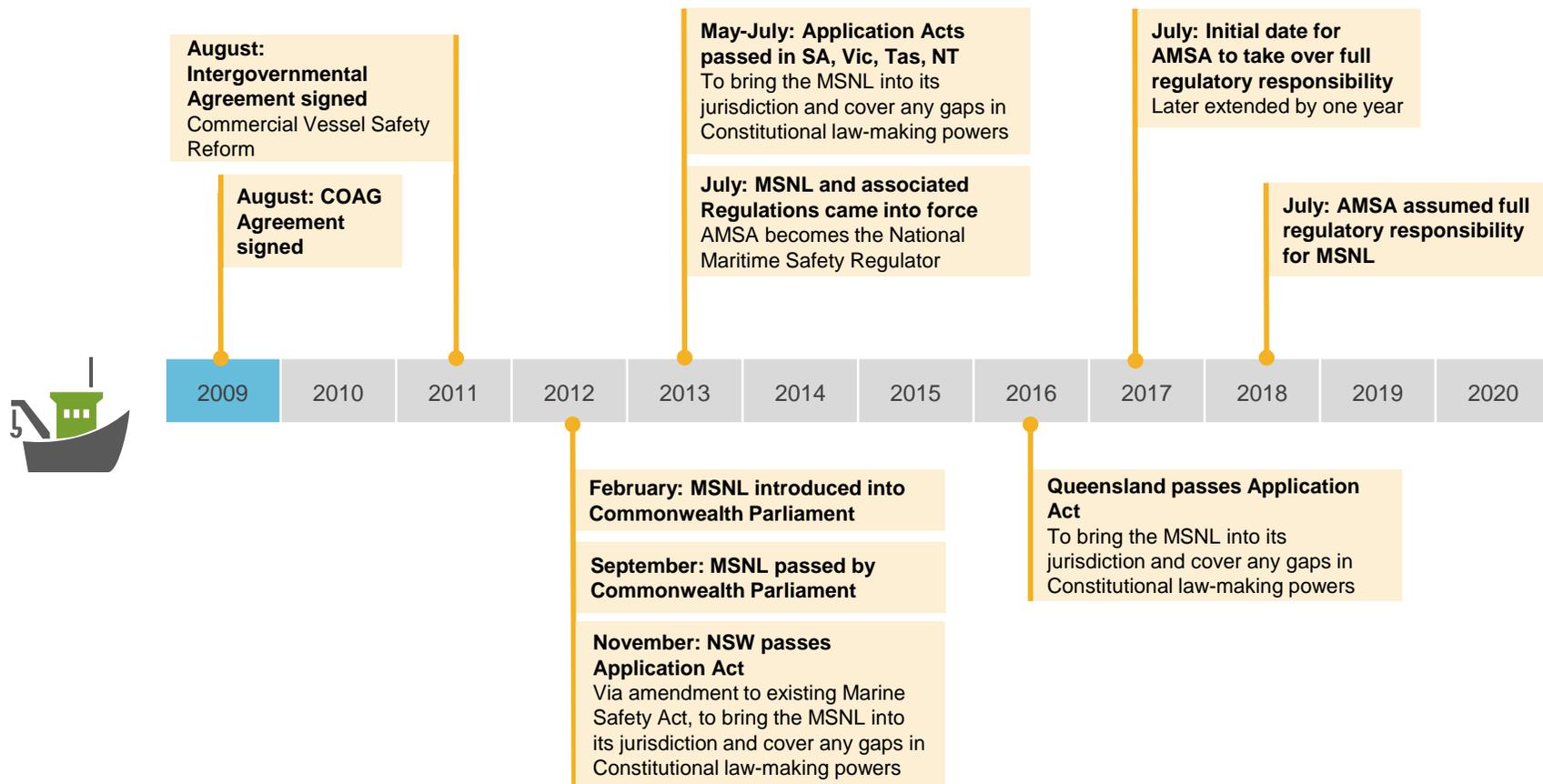
Sources: Various COAG documents, State and Territory legislative documents; NHVR (2019, 2020b); QAO (2016).

Figure 4.4 Implementing the RSNL and establishing ONRSR has been relatively smooth



^a Standing Council on Transport and Infrastructure. ^b Transport and Infrastructure Council. ^c Independent Transport Safety Regulator.
 Sources: Various COAG documents, State and Territory legislative documents; ONRSR Annual Reports; Transport Safety Victoria (2019).

Figure 4.5 Prolonged delays in implementing the MSNL and establishing AMSA as national regulator



Sources: Various COAG documents, State and Territory legislative documents; MIAL (sub. 14, p. 2).

4.4 How ‘national’ are the national laws?

Although the HVNL, RSNL and MSNL are ‘national laws’, factors including coverage, derogations and legislative lags contribute to a lack of national legislative consistency.

Coverage of the national laws

The RSNL and MSNL apply in all jurisdictions. Western Australia and the Northern Territory are not participating in the HVNL (table 4.1). Some heavy vehicle operators are affected by the incomplete coverage (box 4.1). Businesses that operate in Western Australia and/or the Northern Territory as well as an NHVR jurisdiction may still be required to comply with more than one set of regulations and rules.

Table 4.1 Who adopted which national law, and in what form?

	<i>Heavy Vehicle National Law</i>	<i>Rail Safety National Law</i>	<i>Marine Safety (Domestic Commercial Vessel) National Law</i>
Host jurisdiction	Queensland	South Australia	Commonwealth
Non-participating jurisdictions	Western Australia, Northern Territory	..	..
Type of adoption	Mirroring (South Australia), applying (all others)	Mirroring (Western Australia), applying (all others)	Applying ^a

^a Western Australia has not yet enacted formal Application legislation, but is under AMSA’s regulatory jurisdiction. .. Not applicable

Ongoing inconsistencies due to legislative lags

Governments have implemented the MSNL via Commonwealth legislation, and the HVNL and RSNL via laws maintained by one State government and adopted by the other jurisdictions using either a ‘mirror’ or ‘applied laws’ approach (box 4.2). Under the applied laws approach, when an Act is amended by the host jurisdiction, other jurisdictions that apply the law enact the changes automatically. Jurisdictions that mirror the law, however, must complete an additional step of passing equivalent amendments through their own parliaments (figure 4.6).

Box 4.1 **Operator comments on the incomplete coverage of the HVNL**

The lack of participation in the Heavy Vehicle National Law by Western Australia and the Northern Territory is problematic for many operators who cross jurisdictional boundaries:

South Australia is the only state with a border with both non-participant jurisdictions (WA & the NT), which causes significant difficulties in relation to fatigue management compliance for drivers that cross these borders. Current rules essentially require these drivers to be compliant with both sets of fatigue laws for up to a week after the travel is complete — doubling the amount of rest time calculations that must be undertaken, adding complexity, compliance burden and the risk of an inadvertent/unintentional breach. (South Australian Freight Council, sub. 6, p. 6)

Heavy haulage vehicle combinations differ between NHVR States — SA, NSW, and Vic — and WA. East Coast combinations brought across to operate in WA during harvest are often tandem axle trailers/dollies — 26 meters in length. These combinations often have a restricted gross combined mass (GCM) based on the state of registration. (Co-operative Bulk Handling Limited, sub. 13, p. 2)

Differing fatigue management requirements and chain of responsibility regulations [exist]: Fatigue management under the NHVR is an element of the accreditation, managed by NHVR regimes. In Western Australia, fatigue management is an element within Main Roads WA HVA (managed by WorkSafe WA). This means that unlike the NHVR, Western Australia has a multi-party (MRWA/ WA Police/ WorkSafe WA) approach to elements of the MRWA HVA Accreditation. (Co-operative Bulk Handling Limited, sub. 13, p. 2)

Other operators are less affected:

The impact of the non-participation by Western Australia and the Northern Territory has not caused any major complications for GTA members. (Grain Trade Australia, sub. 38, p. 7)

Box 4.2 **The applied laws and mirror approaches to harmonisation**

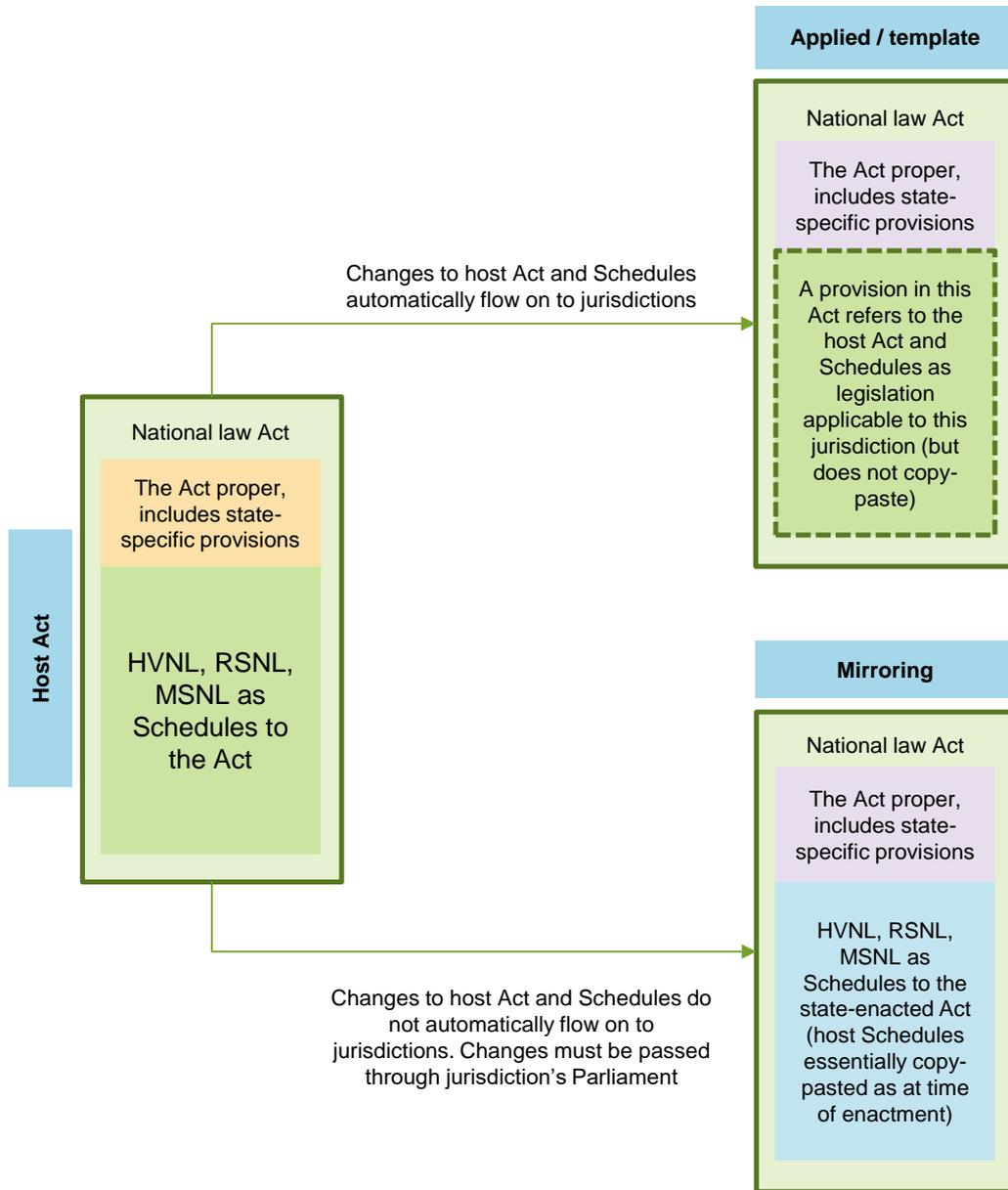
Under the **applied laws approach** (also known as template or referring legislation) one ‘host’ jurisdiction enacts a law that is referred to and applied by other jurisdictions as their law (PC 2008, p. 19, Supplement to Research Report). Generally, the Commonwealth will host legislation on matters within its general legislative powers and State or Territory governments will host other legislation (Parliamentary Counsel’s Committee 2018, p. 2). In transport safety regulation, the heavy vehicle and rail national laws are hosted by State governments (Queensland and South Australia respectively), while the Commonwealth hosts the Marine Safety National Law.

Applied laws are most effective when host legislation is applied by other jurisdictions ‘as in force from time to time’, and without amendment. Under this approach, amendments to the host law automatically flow through to applying jurisdictions, ensuring that all participating jurisdictions have up to date, consistent laws. Staggered adoptions of host laws can undermine national consistency until the participating jurisdictions have passed the host laws.

The **mirror law approach** involves laws being enacted in full in each individual jurisdiction as a copy, or ‘mirror’ of the host law. The mirrored laws are laws of the individual State and Territory, and amendments in the host jurisdiction do not automatically flow through to mirroring jurisdictions.

States and Territories are able to maintain greater control through a mirror law approach than an applied laws approach. State and Territory governments can choose to not implement any amendments that they consider not beneficial to their jurisdiction. If this happens, the laws will not be consistent across jurisdictions.

Figure 4.6 **Applied laws and mirroring lead to different results in the long term**



In principle, the passing of amending legislation by mirroring jurisdictions serves to keep their legislation up to date and consistent with other jurisdictions. However, inconsistencies can arise from the way in which national laws were given effect in States and Territories, and the time required to pass State or Territory legislation and amendments to the legislation.

South Australia has chosen to use the mirror law approach to implement the HVNL, while Western Australia has a general preference for using the mirror law approach when participating in national regulatory regimes (for example, the RSNL) (Parliamentary Counsel's Committee 2018).

Amendments to the RSNL ‘routinely’ take up to two years to pass the WA Parliament (NTC 2018, p. 5). The WA Government has acknowledged the delays:

The RSNL (WA) commenced in WA in 2015 and the legislative amendment packages developed by the [RSNL Maintenance Advisory Group] since then are yet to be included in the RSNL (WA), due to competing legislative priorities. WA acknowledges that the delays in updating the RSNL (WA) have resulted in inconsistencies between the national law and WA law. (sub. 43, p. 9)

These legislative lags have resulted in ONRSR and industry consistently working under different legislation in Western Australia compared to the rest of the country (NTC 2018, p. 5). These mirror law-related inconsistencies can have safety and productivity effects on operators and present difficulties for ONRSR in ensuring safety management systems are applied appropriately across all jurisdictions (ONRSR, sub. 21, p. 27).

Since the introduction of the Rail Safety Law (WA) there have been four amendment packages progressed through the SA Parliament and these are yet to be incorporated into the WA mirror law resulting in a further 28 derogations and the increasing impact on ONRSR and industry. (ONRSR, sub. 21, p. 21)

This has resulted in a number of differences in the law being applied in WA and being reflected in rail transport operators’ safety management systems. For those undertaking business across the WA border the complexities and burden is even greater. (ONRSR, sub. 21, p. 6)

Legislative delays are inevitable when governments adopt the mirror legislation approach, albeit undesirable from the perspective of consistency. The delays might be a necessary cost of achieving a national system, and is probably preferable to a situation where a jurisdiction does not sign up to the national laws. However, in most cases, an applied laws approach leads to more consistent and up-to-date national regulation.

Derogations by signatory jurisdictions

State and Territory governments have enacted derogations from the national laws that have reduced consistency across jurisdictions, with effects on regulators and businesses (box 4.3). Jurisdictions used derogations to continue their historical approach where there was disagreement on aspects of the new national laws. In the context of rail:

While all had agreed to the concept of a national law, there were some areas where agreement could not be reached at the time of establishing the national rail safety regulator. At that time derogations were agreed in the national law and also required in the respective states application law to allow alignment with other state based legislation. The intention was to resolve the national law derogations through reviews to be undertaken by ONRSR post transition. (ONRSR, sub. 21, p. 9)

Box 4.3 Jurisdictional derogations: what are they and when are they appropriate?

A 'derogation' occurs when a State or Territory government applies a regulatory requirement or approach that is not consistent with a national law. Derogations may be more or less onerous than the national standard. The ability to derogate from the national transport safety laws arises from the allocation of powers in the Constitution (chapter 3).

Derogations can be set out upfront (written into the host legislative instrument itself), or can arise when jurisdictions omit or modify agreed-to provisions of the host instrument when passing them into their individual jurisdictions (via their specific 'Application Acts' or versions of the law).

Derogations can be appropriate when the circumstances of a jurisdiction mean the negotiated national laws are unlikely to achieve the intended outcomes (including increased safety, productivity, efficiency), or where the derogations are only administrative and needed to align with existing State and Territory legislation.

Derogations mean that inter-jurisdictional operators are required to comply with multiple sets of rules, resulting in increased compliance costs (chapter 7), attention spent on compliance activities rather than risk management, a loss of flexibility and a reduction in efficiency and productivity (Australasian Railway Association, sub. 26, p. 21).

Derogations are a significant problem in the heavy vehicle and rail sectors; every participating jurisdiction has derogated from the HVNL to varying degrees, and there are a substantial number of derogations from the RSNL. The Commission is not aware of any jurisdictional derogations from the MSNL, although some classes of vessels and operations have been granted exemptions from the national law by AMSA.

Derogations affecting heavy vehicles

The HVNL, which has almost 800 sections and five sets of regulations has been described as 'difficult to read and interpret, onerous for industry to comply with and difficult for the [NHVR] to administer' (Australian Local Government Association, sub. 34, p. 10). Derogations add to the complexity, with implications for how the law is applied and enforced (section 4.5). Industry participants stated that derogations from the HVNL cause disruptions and inefficiencies in areas including 'vehicle maintenance and safety standards, mass management and compliance, as well as, the obligations associated with noise and emissions' (Victorian Transport Association, sub. 23, p. 6).

The National Transport Commission (NTC) analysed the multitude of derogations from the HVNL (2019a, Appendix B). Table 4.2 provides a high-level summary, although the number of derogations is an imperfect indicator of the inconsistency and disruption they cause (box 4.4). New South Wales has the most derogations, which usually add to the requirements in the HVNL. Most derogations relate to enforcement operations, often creating inconsistent standards and application of HVNL enforcement powers.

Table 4.2 Identified jurisdictional derogations from the HVNL

	<i>NSW</i>	<i>Vic</i>	<i>Qld</i>	<i>SA</i>	<i>Tas</i>	<i>ACT^a</i>	Total
Chapter 1: Preliminary	3	0	1	0	0	1	5
Chapter 1A: Safety duties	2	0	0	0	0	0	2
Chapter 3: Vehicle standards and safety	3	0	2	2	0	0	7
Chapter 4: Mass, dimension and loading	0	0	3	0	2	0	5
Chapter 6: Driver fatigue	7	1	0	0	0	0 ^b	8
Chapter 7: Intelligent Access Program	0	0	0	0	0	0 ^{b,c}	0
Chapter 8: Accreditation	3	0	0	0	0	0 ^{b,c}	3
Chapter 9: Enforcement	5	2	4	8	2	2	23
Chapter 10: Sanctions and liability	0	0	0	0	2	1	3
Chapter 12: Administration	2	0	3	0	2	0	7
Chapter 13: General	0	0	0	0	0	8	8
Total	25	3	13	10	8	12	71

^a The NTC found no derogations, but ACT HVNL Act Schedule 1 lists a number of modifications, reflected here. ^b Omitted from ACT version of HVNL until 1 July 2019 (NHVR 2019). ^c Despite now being operational, has limited practical effect for operators compared to the previous situation.

Sources: Adapted from *Heavy Vehicle National Law (ACT) Act 2013*, Schedule 1; NTC (2019a); NHVR (2020a).

Box 4.4 Knock-on effects of derogations

Derogations from one part of the national transport laws can have knock-on effects. For example, in the Heavy Vehicle National Law (HVNL), changes to section 22 of the HVNL Act in South Australia (Moving unattended heavy vehicles on road to exercise another power) make section 518 of the HVNL itself null and void (NTC 2019a, p. 65). Similarly, the addition of section 38 (Power to seize) in the Queensland HVNL Act renders section 552 of the HVNL null and void (NTC 2019a, p. 66). This causes an additional ‘knock on’ derogation to exist in the SA and Queensland laws, which might not have been anticipated or intended by drafters.

In addition, multiple new sections may need to be created in order to facilitate a particular derogation. This may be considered to be a sole derogation, or many, but either way it adds to the amount a law derogates from the national approach, undermining its integrity. For example, in relation to the HVNL mass, dimension and loading provisions, Queensland has altered sections 118 (Commissioner’s consent for a mass or dimension exemption notice) and 124 (other consents). However, in altering these sections, drafters added new sections (sections 22 to 29) to the Queensland HVNL Act as a necessary consequence to facilitate these changes (NTC 2019a, p. 58). Sections 22 to 29 of the Queensland HVNL Act set out the administrative framework for the changes, including decision making, giving notice and review and appeal avenues.

Periodic safety inspection requirements

The National Heavy Vehicle Inspection Manual (NHVIM), developed and published by the NHVR, has been adopted by all HVNL jurisdictions (with additional requirements in Queensland, South Australia and Tasmania) to provide consistent standards and criteria for which vehicles will be inspected (NHVR 2018). However, State and Territory agencies have retained responsibility for vehicle inspections and roadworthiness as part of their registration requirements, as these issues are outside the scope of the HVNL. This has led to varying requirements for heavy vehicle inspections across jurisdictions (table 4.3).

Requirements for scheduled vehicle inspections are determined by the State or Territory of registration, and do not affect vehicles merely travelling through a jurisdiction. Operators with vehicles subject to periodic inspections face higher compliance costs. Businesses that register their vehicles in a jurisdiction with no periodic inspection regime (such as Victoria or the ACT) might have a marginal competitive advantage compared to those registering in jurisdictions with periodic inspection regimes.

Table 4.3 Periodic inspection requirements vary across jurisdictions

	NSW	Vic	Qld	SA	Tas	ACT
Periodic inspection for heavy vehicles	✓	✗	✓	✓ (only for restricted access vehicles above 42.5 tonnes)	✗	✗
Interval	Annually	..	Annually	Annually	..	..
Periodic inspection for buses	✓	✗	✓	✗	✓	✓
Interval	Every 6 months	..	Every 6 months	..	Every 6 or 12 months depending on age of vehicle	Annually
Exemptions	Vehicles participating in NHVAS ^a maintenance module	..	Vehicles participating in NHVAS maintenance module, or vehicles operating solely within exemption areas	..	..	..

^a National Heavy Vehicle Accreditation Scheme .. Not applicable

Sources: Access Canberra (2019); NTC and NHVR (2014); Queensland Government (2018, 2019); *Road Transport (Vehicle Registration) Regulation 2017* (NSW), section 67; South Australian Government (2019); Transport for New South Wales (2015, p. 4); *Vehicle and Traffic (Driver Licensing and Vehicle Registration) Regulations 2010* (Tas), section 102.

Derogations affecting rail

In 2016, a review undertaken by ONRSR ‘identified 85 derogations to the RSNL’, primarily contained within jurisdictions’ application laws (ONRSR, sub. 21, p. 21). ONRSR stated that of these 85 derogations, a sub-set:

... create differences across jurisdictions and present operational issues for multi-jurisdictional operators [and] in turn risks and costs for ONRSR. The most significant of the derogations are around Drug and Alcohol Management and Fatigue Management. (ONRSR, sub. 21, p. 6)

Industry has identified derogations around data loggers, train communications, and mirror legislation in Western Australia as impediments to safety and productivity (Bullas 2017, p. 3; ONRSR 2019, p. 8). ONRSR stated that most other derogations do not cause significant safety or productivity concerns (ONRSR, sub. 21, p. 21), and exist mainly to achieve integration with other State and Territory regulatory frameworks, such as work health and safety laws (ONRSR, trans., p. 8).

Some significant derogations have been rectified

Some of the derogations identified as problematic by industry have been rectified or are otherwise no longer problematic. The repeal of the *Rail Safety (Adoption of National Law) Regulation 2012* (NSW) in July 2018 resulted in the removal of the NSW-specific derogation mandating the use of data loggers (or train safety recordings) on all rolling stock operating on NSW rail networks (ONRSR nd). This means that the RSNL data logger requirements are now the sole requirements across the country.

The NSW derogation around train communications systems, mandating requirements in addition to the RSNL, is now considered by ONRSR as no longer affecting day-to-day operations, because ‘the rail industry has moved on, it’s ... outgrown itself’ with operators now ‘all using the modern day [communications] systems’ (trans., p. 7). Modern train communications systems satisfying RSNL requirements thus also satisfy the NSW requirements.

Outer work limit derogations in New South Wales and Queensland remain

The New South Wales and Queensland Governments mandate outer work limits — maximum shift numbers and lengths, minimum break lengths, and hours in any 14 day period. These requirements differ significantly between the two derogating jurisdictions (table 4.4).

The outer work limits are codified in Schedule 2 of the RSNL National Regulations 2012, and were part of Queensland and NSW law prior to the introduction of the RSNL (though not implemented in Queensland) (ONRSR 2018a, p. 5). These limits operate as a ‘legislative override’ to the co-regulatory risk-based accreditation process that rail workers must satisfy under the RSNL.

Table 4.4 Outer work limit requirements vary^{a,b}

		<i>Max. shift length: 2 person (both qualified)</i>	<i>Max. shift length: 2 person (other)</i>	<i>Max. shift length: 1 person</i>	<i>Min. continuous break (shift ends at home depot)</i>	<i>Min. continuous break (shift ends away from home depot)^c</i>	<i>Max. shifts/hours over any 14 day period</i>
Freight train drivers	NSW	12	11	9, plus min. 30 minute break between 3 rd and 5 th hour of each shift	11	7	12 shifts, but no more than 6 shifts can be 12 hour shifts
	Qld	12	..	9	12	8	12 shifts, but in any case, no more than 132 hours
Passenger train drivers (suburban)	NSW	12	11	9	11	7	Single drivers: 12 shifts 2 drivers: 12 shifts, but no more than 6 shifts can be 12 hour shifts
	Qld	9, with max. 8 hours of driving during any shift	..	9, with max. 8 hours of driving during any shift	..	..	12 shifts, but in any case, no more than 132 hours
Passenger train drivers (non-suburban)	NSW	12	11	10	11	7	Single drivers: 12 shifts 2 drivers: 12 shifts, but no more than 6 shifts can be 12 hour shifts
	Qld	12	..	9	12	8	12 shifts, but in any case, no more than 132 hours
Emergencies	Regulations do not apply in accidents, emergencies, urgent circumstances approved by ONRSR, or other unforeseeable circumstances necessary to avoid serious dislocation of train services, provided that driver(s) indicate their fitness to work extended hours						

^a In both NSW and Queensland, the length of a shift is defined as the time between sign on and sign off. In NSW, shifts longer than 11 hours, but less than 12 hours are considered to be 12 hour shifts. ^b In Queensland, a break is defined as the time between sign off and the next sign on. ^c And the break is taken away from the home depot. .. Not applicable.

Source: Schedule 2 of the Rail Safety National Law National Regulations 2012.

The New South Wales fatigue management rules were changed in response to the findings of public inquiries into fatal accidents, and historical accident statistics (NSW Department of Transport and Roads and Traffic Authority 2000, pp. 2–3). Some industry participants stated that this derogation to the RSNL is unnecessary and ineffective, and undermines regulatory consistency and the benefits of a risk-based regulatory approach (ARA, sub. 26,

p. 23, Pacific National, sub. 24, p. 7). Others are of the view that since the outer work limits were based on the findings of commissions of inquiry following major safety incidents:

... attempts to undermine prescribed outer limits of work hours and rests in a manner contrary to the conclusions of the evidence-based review are littered with assumptions and conclusions without presenting any corroborating evidence grounded in science or fact. (RTBU, sub. 10, p. 8)

Drivers and other railway workers are affected by the Queensland and New South Wales derogations when they enter or leave these jurisdictions. Drivers crossing between Queensland and New South Wales are affected because the two outer work limit regimes differ. The derogations affect up to a quarter of rail operators in Australia — in January 2018, 44 of 186 accredited operators operated both within and outside of New South Wales and/or Queensland (ONRSR 2018a, p. 7). Operators might be required to change driver rostering to manage the different requirements, depending on the configuration of drivers, train type and journey, leading to additional compliance costs (ONRSR 2018a, p. 7).

This increases [rail transport operator] compliance costs by creating an additional internal management burden given the need to ensure compliance with the multiple requirements. (ARA, sub. 26, p. 24)

[C]hanging over train crews when outer limits of service are reached, irrespective of the location of a train on the network, results in staff driving back and forth on roads between depots and locomotives; creating needless road safety risks and added operating costs. (FORG, sub. 8, p. 6)

The drug and alcohol testing derogation in New South Wales also remains

The RSNL requires operators to have in place ‘an appropriate drug and alcohol management plan’. States and Territories take different approaches in delivering these safety outcomes (ONRSR, sub. 21, p. 21). New South Wales imposes a ‘more prescriptive’ drug and alcohol management and testing regime for rail transport operators, ‘different to the rest of Australia’ (ONRSR, sub. 21, p. 15). The additional NSW requirements affect over a quarter of rail operators:

Currently, a New South Wales (NSW) version of the law means two different sets of drug and alcohol requirements exist. According to ONRSR, there are 186 accredited rail operators in Australia. Of those, 53 are currently required to comply with the two different sets of drug and alcohol requirements. This has cost, compliance and productivity impacts for the industry and limits the flexibility for rail transport operators to manage their drug and alcohol risks according to the scenario being addressed. (ARA 2018, p. 4)

Several stakeholders supported removing the NSW derogation (box 4.5). The derogation was intended to be temporary, subject to review three to four years after the commencement of ONRSR. However, attempts to remove the derogation since 2017 have been unsuccessful — a national approach involving their removal from the RSNL could not be agreed by the Transport and Infrastructure Council (ONRSR, sub. 21, pp. 6, 15). More recently, ONRSR has stated that ‘better consistency’ across jurisdictions is anticipated within the next 12 to 24 months, as it monitors international research on drug and alcohol testing, and in particular the accuracy of saliva drug testing (ONRSR, trans., p. 9).

Box 4.5 **Industry: the NSW drug and alcohol testing requirements should be removed**

A range of industry bodies have been vocal in their support of removing the NSW drug and alcohol testing requirements, in favour of national consistency:

Whilst Arc supports a nationally consistent drug and alcohol policy, Arc does not support adoption of the variations required by New South Wales. Arc is of the view that states adopting modified policies goes against the spirit of national regulation and limits the benefits that can be achieved by having a national regulator. (Arc Infrastructure, sub. 17, p. 6)

The NSW specific drug and alcohol requirements add compliance costs and negatively affect productivity for the industry by limiting an RTO's flexibility to manage their drug and alcohol risks. (ARA, sub. 26, p. 22)

[r]emoval of this [drug and alcohol] inconsistency would simplify the requirement for inclusion in an operators Safety Management System, allow for adaptability and scalability and reduce the regulatory burden. (ONRSR, sub. 21, p. 15)

The ARA considers that removing prescriptive elements in NSW and QLD and establishing a nationally consistent risk-based approach to drug and alcohol and fatigue management will generate cost savings for both industry and government. It will allow RTOs working in NSW and QLD to manage their operations to target identified risks and provide clarity around expectations and approaches. (ARA, sub. 26, p. 21)

Enforcement-related derogations

All participating jurisdictions have enforcement-related derogations. Some are relatively minor and procedural. For example, the addition of two sections to the Queensland Application Act (sections 35 and 37) serve to preserve the operation of the *State Police Powers and Responsibilities Act 2000* (Qld).

However, many enforcement-related derogations fundamentally alter the operation of the provisions. The many derogations from chapter 9 of the HVNL include additions, omissions and alterations, which lead to:

- inconsistent application of enforcement powers
- greater enforcement powers for authorised officers (and police) — for example, the addition of section 21(1) (Authority to use force) in Tasmania, in conjunction with section 21(2)
- the creation of new offences — for example, the alteration of section 21 (Offence to sell or dispose of heavy vehicle in respect of which vehicle defect notice is in force) in South Australia
- the creation of a scenario that is not addressed by the HVNL — for example, an alteration of section 556 (Return of seized things or samples) in Victoria, despite not affecting the overall operation of the section itself
- inconsistent application of natural justice requirements under the HVNL — for example, the addition to section 9 (Use of certificates in assessing compensation section 613(1) of the HVNL) in Victoria

-
- direct inconsistency with the HVNL — for example, the addition of section 38 (Power to seize) in Queensland, which renders section 552 of the HVNL null and void
 - non-police authorised officers having different powers — for example, the addition of section 39 (Power to require production of driver licence) in Queensland.

Mirror legislation in Western Australia

ONRSR stated that it considers legislative differences arising from the WA Government's use of mirror legislation to be derogations that should be removed:

... the removal of the mirror law in WA would, remove derogations and reduce the administrative burden on operators who operate in Western Australia and other jurisdictions as well as on ONRSR and the WA Government who would no longer be required to draft and progress legislation through their own parliament. (ONRSR, sub. 21, p. 31)

Amendments to the RSNL increase the number of derogations between the RSNL and the WA version of the law, unless the WA Parliament more rapidly adopts the changes into its own legislation. ONRSR stated that it is in the process of working with the WA Government in an attempt to find a solution to the problem (ONRSR, trans., p. 9).

FINDING 4.2 – DEROGATIONS FROM ROAD AND RAIL LAWS UNDERMINE CONSISTENCY

There are more than 70 derogations from the Heavy Vehicle National Law and more than 80 derogations from the Rail Safety National Law. Derogations are contrary to the aims of harmonisation, and often create unnecessary costs and complexity for businesses and regulators.

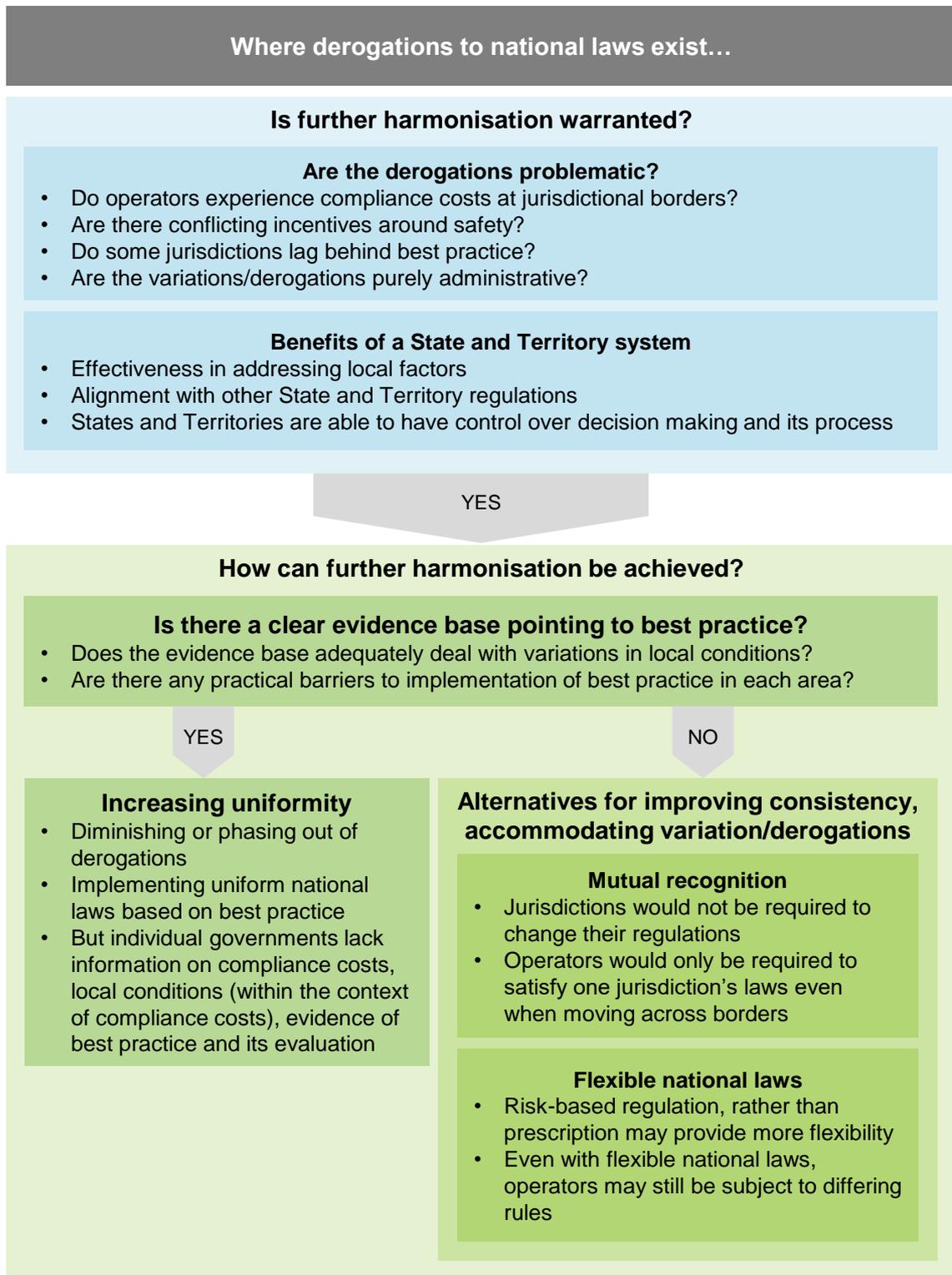
Removing derogations is a balancing act

Derogations can be a negotiating tool to encourage jurisdictions to join a national regulatory regime, and are often preferable to a lack of agreement or participation. The effects of derogations can vary — some are material, others mainly administrative. Regardless, derogations enacted at the infancy of a national regime need not be ingrained. Derogations hinder national consistency and governments should remove them unless the evidence shows clear net benefits for their retention (figure 4.7).

Inquiry participants stated that removing derogations requires State and Territory governments to change their approach to harmonisation.

... there will need to be a change of 'mind-sets' and a significant improvement in the spirit of goodwill between the jurisdictions if we are to achieve a greater 'harmonisation' of the Law. (Victorian Transport Association, sub. 23, p. 6)

Figure 4.7 Issues to consider when considering further harmonisation



The Australian, State and Territory governments should re-affirm the principle of consistent national transport regulation. To put this commitment into action, governments should agree to identify the existing derogations and assess their effects on transport operators, regulators and the community. The purpose of the process is not to achieve ‘harmonisation at any cost’. Some derogations might be shown to be beneficial, or necessary to integrate the transport safety regulations with other State and Territory laws. However, derogations should also not be used as a de facto means of maintaining a State-based regulatory system; derogations that impose significant costs and do not deliver equivalent or greater benefits are an impediment to increased safety and/or productivity, and should not be retained.

RECOMMENDATION 4.1 – IDENTIFY DEROGATIONS FROM HEAVY VEHICLE AND RAIL LAWS

The Transport and Infrastructure Council should re-affirm the principle of consistent national transport safety regulation. The members of the Council should commit to removing material derogations from the Heavy Vehicle National Law and Rail Safety National Law.

4.5 National consistency of application and enforcement

Inconsistent application of the national laws can lead to similar operators being treated differently depending on where they operate, despite being subject to the same national laws. Grandfathering, service-level agreements and derogations all affect the way the laws are applied across participating jurisdictions.

Inconsistent application due to grandfathering provisions

Grandfathering arrangements allow for a pre-existing (State or Territory) rule to continue to apply to existing operators or assets (vehicles or vessels), while a new rule is applied to new operators or assets. Grandfathering was used in the early stages of implementing the HVNL, and, to a minor extent, the RSNL (ONRSR 2018b, p. 12), but no longer applies in either.

Grandfathering of domestic commercial vessels is widespread

A substantial number of domestic commercial vessels and operators remain subject to State and Territory standards and requirements that were in place prior to the introduction of the MSNL in 2013. Grandfathering arrangements still apply with respect to survey requirements, vessel standards, crewing and competency, and are contained in a range of instruments (table 4.5). AMSA has recently revoked grandfathering for a limited number of rules covering safety equipment, float-free EPIRBs (Emergency Position Indicating Radio Beacons), operational requirements and survey frequency (AMSA, sub. DR71, p. 9).

Table 4.5 Grandfathering arrangements for domestic commercial vessels are contained in a range of instruments^a

<i>Survey (including standards)</i>	<i>Competency</i>	<i>Crewing</i>
<ul style="list-style-type: none"> • Marine Safety (Domestic Commercial Vessel) National Law Regulation 2013 • Marine Order 503 (Certificates of survey — national law) • Exemption 02 (Certificates of survey) 	<ul style="list-style-type: none"> • Marine Safety (Domestic Commercial Vessel) National Law Regulation 2013 • Marine Order 505 (Certificates of competency — national law) 	<ul style="list-style-type: none"> • Marine Order 504 (Certificates of operation and operation requirements — national law)

^a Excludes exemptions which do not explicitly mention grandfathering, although exemptions themselves act as a means of requiring an older or lesser standard be met (similar to grandfathering).

Parties have different interpretations of the reasons for grandfathering provisions in the MSNL (box 4.6). Some regard the grandfathering provisions as a permanent part of the national system, others see them as time-limited transitional measures. The ongoing use of grandfathering is an impediment to national consistency that affects AMSA’s ability to regulate effectively (chapter 5) and the safety of vessel operators and passengers (chapter 6).

The legislative instruments in table 4.5 effectively allow for the indefinite grandfathering of applicable vessels and standards. The National Law Regulation and the relevant Marine Orders themselves are due to sunset in 2023 under the requirements of the *Legislation Act 2003* (Cwlth), but can be remade without any requirement for material change (Department of Prime Minister and Cabinet 2016). There are no sunset clauses with respect to the grandfathering provisions themselves under the MSNL.

Some grandfathering provisions are contained in exemptions from the MSNL, which do have specified duration periods (usually one or two years). However, AMSA can renew exemptions at their expiry date, with or without amendment. For example, Exemption 02 relating to certificates of survey and their grandfathering was introduced on 1 July 2013, and has been renewed five times since. There are no limits on the number of times an exemption can be renewed.

The issue is exacerbated by the long service life of maritime vessels. Vessels can be covered by the grandfathering arrangements until they cease operating or the legislation is changed. Some decades-old vessels are permitted to continue operating under outdated State and Territory regulations, rather than the MSNL. Until the last of the grandfathered vessels retire from service, the regulation of domestic commercial vessels will not be nationally consistent.

Grandfathering complicates AMSA’s task of enforcing the law. The regulator is required to be aware of and implement a range of regulations that are outside of the MSNL and no longer maintained by State and Territory governments.

Box 4.6 Intention of grandfathering in the MSNL

The drafting of the relevant section of the initial Commercial Vessel intergovernmental agreement is vague about the purpose of grandfathering and does not set any timelines for its removal:

... transitional/grandfathering provisions are being designed to ensure introduction of the national system occurs in a progressive and structured manner. (COAG 2011a, pt. C2)

In 2011, the Transport and Infrastructure Council stated that:

The national system is ultimately intended to cover all commercial vessels in Australian waters. However there will be arrangements covering transitional/grandfathering provisions to ensure introduction of the national system from 2013 occurs in a progressive and structured manner. (AMSA, sub. DR71, p. 10)

The Department of Infrastructure, Transport, Regional Development and Communications and AMSA have interpreted this to mean that grandfathering arrangements would 'continue to apply unless incident data dictates the need to adopt an alternative approach' (DITRDC, sub. DR74, p. 3; AMSA, sub. DR71, p. 10).

The Explanatory Memorandum for the MSNL did not clarify whether grandfathering was intended as a transitional or permanent measure.

The power for the National Regulator to provide ... transitional and grandfathering arrangements ... are important to support the smooth transfer of domestic commercial vessel safety arrangements from current State and Territory schemes to the new National Law. (Clause 143, MSNL National Law Bill Explanatory Memorandum)

Some inquiry participants agreed that grandfathering provisions were intended to be transitional. The Queensland Department of Transport and Main Roads submitted that:

While Queensland was initially supportive of adopting some grandfathering provisions (... other jurisdictions were less supportive), it is now six years since the enactment of the National Law and we are seemingly no closer to a consistent national standard. (sub. 28, p. 3)

In response to the Commission's draft report, Maritime Industry Australia Limited and the Maritime Union of Australia stated that they agreed with the draft finding that grandfathering was intended to smooth the transition to the MSNL (MIAL, sub. DR56, p. 1; MUA, sub. DR77, p. 3).

As a general principle, grandfathering should be a transitional tool to facilitate a movement from old regulatory regimes to a new regime. It has been almost 8 years since the MSNL was introduced, and AMSA now has full responsibility for the regulation of domestic commercial vessels. All vessels (no matter their age) should also transition to full coverage under the national law, subject to a consideration of the resulting safety implications and costs for industry.

FINDING 4.3 – ONGOING GRANDFATHERING OF DOMESTIC COMMERCIAL VESSELS HAS COSTS

It is unclear whether grandfathering was intended to be a temporary or permanent measure under the Marine Safety National Law. Open-ended grandfathering perpetuates the inconsistencies of previous State and Territory regimes, delays the adoption of new safety practices and complicates enforcement.

Addressing grandfathering

Some industry participants stated that they expect grandfathering to persist.

Due to commitments made to industry prior to the commencement of the transition, there is little capacity for AMSA as the regulator to alter this approach. (MIAL, sub. 14, p. 4)

Expectations that grandfathering will remain should not prevent sensible changes that would increase safety and facilitate harmonisation. Where grandfathering provisions are not leading to problems, there is no need to change. Provisions that are increasing safety risks or unacceptable compliance and administration costs should be assessed to determine whether the provision should be removed, or some other action taken (figure 4.8).

Assessment of each grandfathering provision would require a consideration of the benefits and costs of removing the provision. Removing a grandfathering provision could result in disruption and cost to vessel operators. Affected parties might have to make significant changes to their operations or assets to comply with the new regulations. The costs could include loss of income while works are undertaken, as well as the capital cost of updating vessels and equipment. Operators might also face higher labour costs, if the removal of grandfathering provisions means they are required to increase crewing.

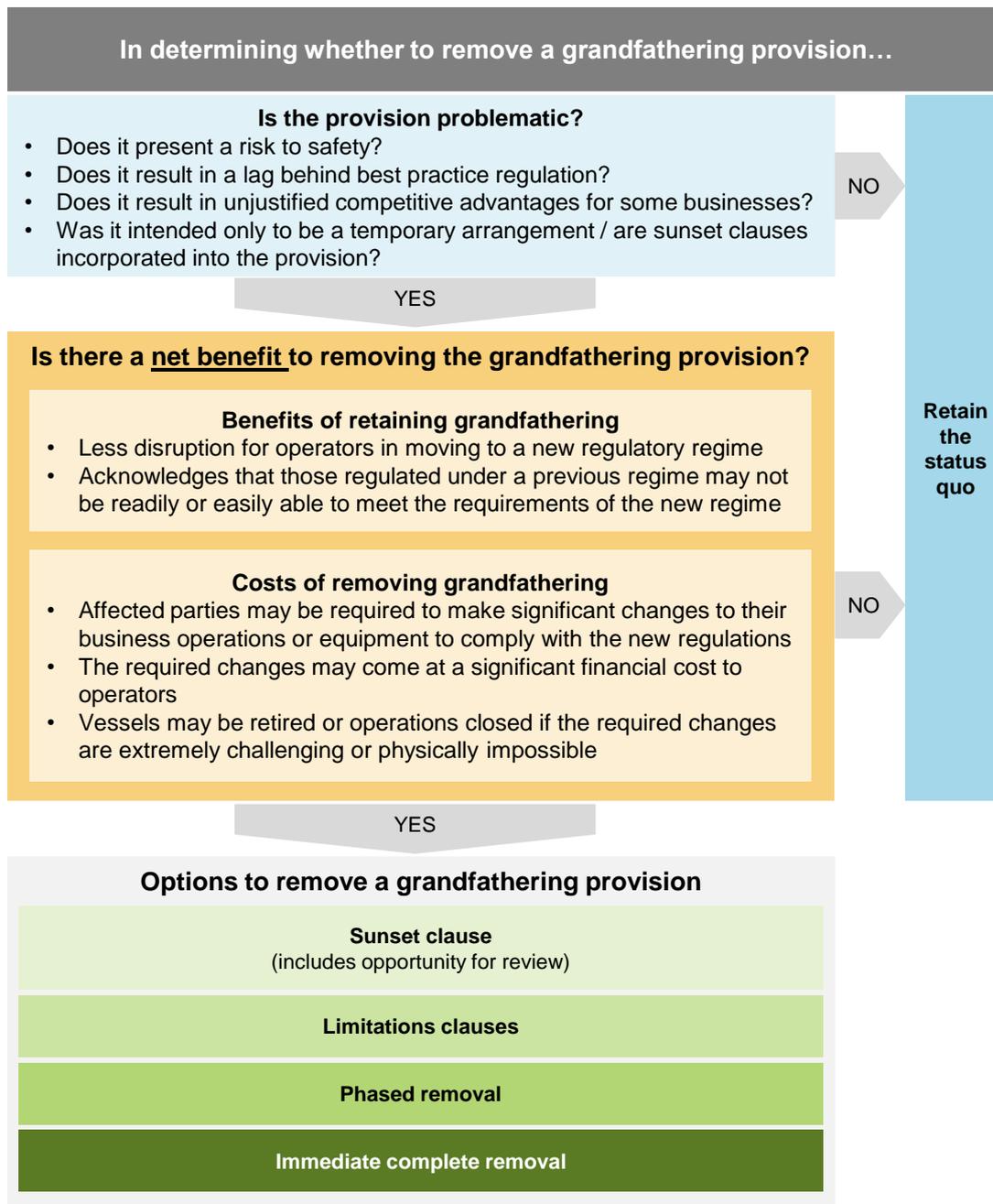
Where it is determined that a grandfathering provision is problematic and there is a net benefit in its removal, there are a number of options which can be taken to remove the provision. One option is to include a sunset clause to the existing provision — a date by which the provision will cease to have effect. Sunset clauses can provide clarity to operators and regulators and allow for lawmakers to review the grandfathering provision to determine whether it remains effective and fit for purpose. Sunset clauses were incorporated as part of grandfathering provisions in the HVNL, but not the MSNL.

Another option is limitations clauses that set out conditions, which, if satisfied, remove grandfathering for the particular asset. Limitations clauses are already used in the MSNL, where changes to a vessel's structure, operation or area of operation that lead to an increased level of risk result in grandfathering ceasing to apply in entirety to a vessel (AMSA 2019). Where limitations clauses are enacted, no operator is forced to move to the new regulatory standards, but may choose to voluntarily do so by fulfilling the set criteria. Operators can individually assess the value of grandfathering and other options. The limitations clause approach would lead to a slow removal of grandfathering provisions.

Another option is a phased removal — ending grandfathering arrangements according to level of risk posed, vessel class type or other characteristics. Phased removal of grandfathering would give industry time to make arrangements to limit the cost of transition.

Immediately ending grandfathering for all covered assets and operations would achieve a definite end to grandfathering and immediate national consistency. The downside would be the cost to industry, including the risk that some assets would be 'stranded' by the cost of compliance with the new regulations.

Figure 4.8 Issues to consider when considering removing a grandfathering provision and evidence is available



Service-level agreements

State and Territory governments entered into service-level agreements (SLAs) as part of the process of harmonisation. SLAs are contractual agreements whereby a State or Territory agency agrees to undertake defined functions on behalf of the national regulator.

COAG anticipated the use of SLAs in the three IGAs, and they proved useful in the early transition to national laws and regulators. SLAs allowed for the national regimes to commence before all administrative arrangements were settled, and also allowed for a smoother transition to the new regulator for industry.

The form of an SLA and the powers granted to State and Territory government agencies can affect the consistency of regulation, administration and enforcement (box. 4.7). Governments and regulators have continued to use SLAs long after the enactment of the national laws. The extended use of SLAs may have been required due to delays in establishing and resourcing the national regulators, however their ongoing use prolongs the time required for a national regulator to reach maturity.

Box 4.7 Achieving national consistency through SLAs

National consistency of decision making where State and Territory agencies deliver services through service-level agreements (SLAs) is more likely when the State or Territory authority is an **agent** (or has the *authorisation*) of the national regulator (APSC 2004; Department of Finance 2017). Agency allows for a national regulator to impose a single set of principles or guidelines regardless of jurisdiction, actioned by the State or Territory, with limited autonomy in decision making.

A higher risk of inconsistent decision making exists where an SLA empowers State or Territory authorities to act as a **delegate** of the national regulator. As a delegate, the State or Territory authority is able to make decisions in its own right, and its decisions are not the act of the national regulator (APSC 2004; Department of Finance 2016). States and Territories would be able to exercise their own interests and focus on their own priorities in decision making, leading to a higher risk of inconsistent decision making across jurisdictions for similar issues.

SLAs in heavy vehicle safety regulation

The HVNL is enforced by the NHVR and numerous other heavy vehicle enforcement bodies, including ‘authorised officers’, State and Territory road authorities and police, each with its own enforcement approaches, priorities and powers (NTC 2019b, p. 34). Industry is concerned that the limited role that the NHVR plays in enforcing the law results in inconsistency for businesses (box 4.8).

The Transport and Infrastructure Council has considered the issue of how to manage the transfer of regulatory services to the NHVR:

As part of ensuring improved safety, reducing regulatory red tape and keeping costs to a minimum, Ministers also agreed to undertake an independent assurance review to assess options for how regulatory services are delivered. The review will report at Council’s first meeting in 2019. (2018, p. 3)

Box 4.8 Several stakeholders commented on the NHVR’s role in enforcing the HVNL

NatRoad stated that an increased role for the National Heavy Vehicle Regulator (NHVR) would result in a more consistent and effective enforcement regime:

NatRoad members are very concerned that enforcement of the HVNL is not consistent and is in the hands of too many agencies. The NHVR at present has a limited role in enforcement (Tasmania, South Australia and the ACT have vested their enforcement responsibilities in the NHVR) with State agencies and the Police having a greater role. NatRoad would like to see fundamental enforcement reform, as outlined in the submission to the NTC. That reform would vest more responsibility in the NHVR and enable greater levels of justice in the application of the law through a tribunal system and greater and more consistent levels of education amongst operatives. This is an area where role clarity is poor and the trust and confidence that is required in the enforcement of the HVNL and related laws is low. The transfer of State-based enforcement to the NHVR must be accelerated. (sub. 7, p. 14)

The South Australian Freight Council also raised the issue of differences between NHVR compliance officers and police officers:

There are also related issues with consistency of enforcement. NHVR compliance officers and all sworn police officers are considered ‘authorised officers’ for the purposes of the law. NHVR and specialist heavy vehicle branch police officers are trained to a high standard, and have the inbuilt experience benefit of operating with the law every day. General duties police officers do not- while they may have had some training, they are not specialists and road interceptions of heavy vehicles likely constitute only a small portion of their work duties. Reports from industry members indicate that these officers are more likely to charge for technical (non-safety related) breaches, and may interpret the law incorrectly ... The land transport industry is national - there should be as little state level regulation as possible, and no state level compliance and enforcement beyond that provided by police. All derogations from that principle cause additional regulatory burden, increase costs and lower business productivity. (sub. 6, p. 6)

The Australian Logistics Council raised the issue of enforcement responsibilities among heavy vehicle regulators, noting that:

‘work needs to be done to ... [f]inalise the transfer of enforcement officers from jurisdictional regulators to the NHVR’. (sub. 12, p. 5)

The Red Meat Advisory Council agreed.

Jurisdictional consistency and true harmonisation are hindered by having multiple regulatory authorities to deal with when moving through the transport network and permitting system. (sub. DR52, p. 3)

The Commission has examined a confidential draft of the assurance review that the Independent Review Panel provided to the Transport and Infrastructure Council. The review panel has made many observations about the transition of regulatory services to the NHVR, and the concerns held by State and Territory governments. It has recommended changes to the governance of relations between the NHVR and State and Territory governments; the strategic direction of the NHVR; the NHVR’s capabilities and issues relating to the transition of responsibilities to the NHVR.

The Transport and Infrastructure Council endorsed some of the recommendations of the report at its meeting in August 2019.

In response to the National Heavy Vehicle Regulator (NHVR) Services Transition Assurance Review, Council reaffirmed its ongoing commitment to the NHVR and its national mandate and tasked officials to ensure closer alignment between jurisdictions and the NHVR on regulatory

approaches, including through the establishment of a working group with an independent chair under the direction of the Transport and Infrastructure Senior Officials Committee. (2019, p. 4)

The Transport and Infrastructure Council should continue to work towards the transition of enforcement functions to the NHVR to achieve consistency in enforcement. State and Territory government agencies will retain responsibility for aspects of heavy vehicle enforcement, including police and workplace health and safety agencies. The NHVR should work with such agencies to ensure that the regulatory burden on heavy vehicle operators is commensurate with the risks of their operations.

SLAs in rail and maritime safety regulation

In rail, State and Territory police forces have an important role in enforcing the RSNL:

ONRSR has effective MOUs in place with various police departments in Australia. ONRSR work with the police in determining the appropriate party to lead a prosecution and also have arrangements in place with police agencies to provide assistance with evidentiary breath analysis of rail safety workers where required. (ONRSR, sub. 21, p. 42)

In maritime regulation, ‘AMSA now administers all functions involved in the operation of the national system for domestic commercial vessel safety. This includes ... performing all operational and enforcement functions’ (AMSA, sub. 35, p. 6). Some States have entered into agreements with AMSA to continue working in partnership for compliance and enforcement activities (DPTI 2018; NSW Government 2019). However, the arrangements for compliance and enforcement in rail and domestic commercial vessels do not appear to be a point of concern to industry.

Addressing SLAs

SLAs were entered into as a means of smoothing the transition to the new national regime for both the regulators and operators. Now that the national regulators are sufficiently established, existing SLAs with States and Territories should be phased out, with the national regulators absorbing these functions. The Commission acknowledges that in some cases, the use of SLAs is necessary to ensure efficiency in the delivery of regulatory services. However, the existence of SLAs should not lead to differing application and enforcement of the national laws across jurisdictions. Where there is a business case for the use of SLAs, it should be ensured that the national regulators direct the decisions made by State and Territory agencies (or other third parties) to ensure consistency.

RECOMMENDATION 4.2 – TRANSFER REGULATORY POWERS TO THE NATIONAL REGULATORS

The Transport and Infrastructure Council should agree to transfer all regulatory functions still held by participating jurisdictions to the National Heavy Vehicle Regulator by 2022.

To ensure consistent application of the national laws, the National Heavy Vehicle Regulator and Australian Maritime Safety Authority should phase out service level agreements with State and Territory agencies.

However, where there is a business case for the national regulators to retain service level agreements with third parties, those parties should act under the direction of the national regulators to ensure consistent decisions across jurisdictions.

Inconsistencies for above-rail operators

Below-rail track owners and rail infrastructure managers (RIMs) must ensure that their infrastructure and networks meet the requirements of the nationally-consistent RSNL regulatory regime through co-regulation with ONRSR. However, above-rail operators face inconsistency within this consistent co-regulatory regime.

Each State and Territory has its own engineering standards for trains and track infrastructure, leading to different requirements for above-rail operators. In addition, thirteen RIMs operate networks in Australia (PwC 2018, p. iv), with differences in signalling equipment, rail access conditions, rolling stock standards, recognition of qualifications and technical specifications.

Multiple approvals from track owners and RIMs are required for cross-border (and even cross-track) routes and activities. In the three main rail freight corridors, operators may need to negotiate up to six different access regimes (PwC 2018, p. 6). Pacific National stated that differences in network rules are an impediment to efficiency:

For example, on the north-south rail corridor, operators may need to negotiate up to six access agreements with network owners. As a result of this red tape, the potential economic benefits of ten years of COAG reforms have not been realised. (sub. 24, p. 4)

Accreditation for one track in one jurisdiction does not guarantee accreditation elsewhere (even a different track in the same jurisdiction), which may prevent businesses from operating across tracks and jurisdictions.

While this is outside the direct control of ONRSR, network rules applied across different networks, or even within single networks, have not been harmonised by the RIMs. (ONRSR, sub. 21, p. 6)

Box 4.9 summarises some industry concerns. Network operators and above-rail operators each have opportunities to contribute to greater consistency in network operating rules. Investment in infrastructure might be necessary in some cases, but not all. Some matters might be addressed through administrative changes. Others could be managed by installing new technology onto existing rolling stock. The national regulator has a limited role in this area — parties will have to come together to reach a commercial solution to their problems.

Box 4.9 Multiple approvals from track owners and rail infrastructure managers inconvenience operators

Above rail operators are often required to gain multiple approvals from a range of bodies in order to operate on differing networks, despite being certified by ONRSR at a national level.

[W]e have different systems and rules which not only vary across different networks but on different sections of the same network despite having the one [rail infrastructure manager]. (Pacific National, sub. 24, p. 5)

[More] than 600 rail routes across Australia require a myriad of different operating codes and standards for running a freight train. "During long-haul interstate or trans-continental trips, train drivers will travel on multiple rail networks, each having a raft of different codes, standards and communication protocols that must be adhered to. This is an area in our industry ripe for simplification, modernisation and harmonisation". (Freight on Rail Group, sub. 8, p. 6)

Australia's rail supply chain transport infrastructure and its operation has suffered the adverse effects of inconsistencies between different State and Territory jurisdictionally based decision making. Historically, there is a relatively small annual tonnage that moves interstate by rail. However, on the occasions (such as when regional droughts occur) when demand for interstate movements occur the industry is required to deal with a lack of harmonisation of standards and multiple interfaces between different state systems. (Grain Trade Australia, sub. 38, p. 7)

The most significant driver of inconsistency of rail regulatory regimes is the disparity of procedures and methods employed by regulators in the development and approval of access undertakings and also in the operation of the negotiate-arbitrate framework. The rail industry has engineering standards, operating and environmental conditions, legacies and inherited asset conditions which are substantially different across networks in contrast to the more uniform nature of other regulated sectors of the economy. (Aurizon, sub. 30, p. 14)

In some cases, operators are prevented from being able to operate easily in other jurisdictions:

Prescriptive engineering standards vary between different jurisdictions leading to captive locomotive and rollingstock assets which cannot be operated in other jurisdictions without costly and inefficient modifications or administrative waivers. (Pacific National, sub. 24, p. 3)

FINDING 4.4 – RAIL NETWORK STANDARDS AND RULES ARE A BARRIER TO CONSISTENCY

Different technical standards, operating codes and procedures set by rail network owners can complicate the movement of rolling stock across networks. Rail network operators and above rail operators have opportunities to reduce the costs of differences in network standards. Potential solutions include investment in rail infrastructure and rolling stock and administrative changes to network rules. These are commercial matters and are not the responsibility of the National Rail Safety Regulator.

5 Assessing the national regulators

Key points

- The national transport safety regulators are at different stages of implementing the national systems and achieving the objectives that the Council of Australian Governments (COAG) set in the intergovernmental agreements (IGAs) signed in 2011.
- The National Heavy Vehicle Regulator is responsible for applying the Heavy Vehicle National Law (HVNL).
 - Excessive prescription in the HVNL is a barrier to achieving effective national regulation and can be inimical to good safety outcomes.
 - The National Transport Commission review of the HVNL is an opportunity to support more flexible, performance-based regulation.
- The Office of the National Rail Safety Regulator (ONRSR) is responsible for implementing the Rail Safety National Law (RSNL).
 - The RSNL empowers the regulator to take a flexible, co-regulatory approach to regulation.
 - Of the national regulators, ONRSR has made the most progress toward achieving the COAG IGA objectives.
- The Australian Maritime Safety Authority (AMSA) is responsible for applying the Marine Safety National Law (MSNL).
 - Before the MSNL was introduced in 2013, AMSA was responsible for safety regulation of international shipping (about 4500 vessels per year) and registered Australian vessels. The addition of domestic commercial vessels to AMSA's responsibilities means that AMSA now has direct regulatory engagement with about 22 500 additional vessels. The vessels within its remit range from hire kayaks and tinnies to trawlers and passenger ships.
 - The breadth of AMSA's responsibilities and the grandfathering provisions applying to some vessels are impediments to AMSA achieving the COAG IGA objectives.
 - AMSA is making progress as the national regulator but recognises that it has room for improvement in service delivery and stakeholder engagement. AMSA also needs a sustainable cost-recovery funding model.

5.1 Introduction

This chapter sets out the Commission’s assessment of the three national transport regulators — the National Heavy Vehicle Regulator (NHVR), the Office of the National Rail Safety Regulator (ONRSR) and the Australian Maritime Safety Authority (AMSA). In the inquiry terms of reference the Australian Government asked the Commission to examine:

... the implementation and development of the three national regulators (heavy vehicle, rail safety, and maritime safety), and the delivery against agreed objectives as set out in the IGAs and COAG priorities for transport.

The Commission has examined whether the regulators have delivered against the objectives in the intergovernmental agreements (IGAs) (box 5.1). It has considered the:

- policy frameworks that influence the regulators’ ability to achieve the IGA objectives
- regulators’ performance during and after the transition to the national regulatory regime.

Box 5.1 COAG’s reform objectives for transport

The Australian, State and Territory governments signed three intergovernmental agreements (IGAs) in 2011. The objectives in the **heavy vehicles** IGA were:

- seamless national regulation of heavy vehicles that achieves the same outcome in the same circumstances
- consistent and streamlined administration and service provision for the regulation of heavy vehicles (COAG 2011b, p. 5).

The objectives in the **rail safety** IGA were:

- improved rail safety for the Australian community
- seamless national safety regulation of rail operations (COAG 2011c, p. 4).

The objectives in the **commercial vessel safety** IGA were ‘safe commercial vessel operation and its effective, consistent and efficient regulation’ (COAG 2011a, p. 5).

Assessing the policy frameworks

The national transport regulators operate within frameworks of legislation, regulation and funding agreed by the Australian, State and Territory governments. As noted by the NHVR, these frameworks influence the regulators’ ability to meet the IGA objectives.

This review is about the effectiveness of, in effect, the three regulators and the reform. As a regulator I’m only as effective as the policy framework that I am given. (trans., p. 128)

Regulators are more likely to be effective when they have clear roles and responsibilities, the power to carry out their functions, adequate resources and appropriate governance arrangements (box 5.2).

Box 5.2 **Criteria for assessing policy frameworks**

Roles and responsibilities — The roles and responsibilities of a regulator and related parties need to be clearly specified and consistent with the intended regulatory outcomes.

Capability — Regulatory bodies need adequate finances, suitably skilled staff and information.

Powers — Regulators need clear compliance and enforcement powers appropriate to their task.

Governance — Boards of regulators need an appropriate level and mix of skills and sound processes for managing conflicts of interest and for performance assessment.

Sources: ANAO (2014a, 2014b); OECD (2014); PC (2018).

Assessing regulator behaviour

Regulators' behaviour — the choices they make and the priorities they pursue — determine whether they achieve desired outcomes, subject to the constraints of the policy framework. As the Commission noted in its report *Regulator Engagement with Small Business*, regulator behaviour is critical.

Regulators, by their conduct in interpreting, administering and enforcing regulatory requirements, can take considered, well designed regulation and produce regimes which discourage compliance, squander government resources or add to business costs and delays. Alternatively, a regulator might take an unwieldy accumulation of regulation and, by choosing judiciously what, when and how to enforce, deliver the desired regulatory outcomes in an efficient manner. (PC 2013, p. 3)

The Commission has gathered evidence on aspects of regulator behaviour that it considers particularly relevant to the objectives of the national transport regulatory reforms, including:

- whether the regulator takes flexible approaches to regulation and enforcement
- the quality of the regulators' service delivery and stakeholder engagement
- the way regulators use the powers they have to achieve objectives.

A note on evidence

The Commission consulted with numerous parties in the process of preparing this report (appendix A). Many participants commented on the effectiveness of regulators, the capability of the executive and staff of the regulators and their engagement with the industry. Some of these comments were made in submissions or other written evidence; others were made in off-the-record meetings with the Commission. The Commission has given a greater weight to evidence that is publicly available but has also considered other evidence.

5.2 The National Heavy Vehicle Regulator

Nationally consistent heavy vehicle regulation is a work in progress. Inquiry participants, agreed that the NHVR has not yet reached full maturity.

The effective [implementation] of the NHVR has not been fully achieved to date. ... This is clearly witnessed in the derogations of the HVNL [Heavy Vehicle National Law] by the state governments. This significantly impacts upon the current effectiveness of the NHVR. (VTA, sub. 23, p. 8)

The following sections identify reasons for the delayed achievement of some IGA objectives.

The policy framework

The NHVR commenced operation in January 2013 as the single national independent agency applying the Heavy Vehicle National Law (HVNL). The NHVR was not established, nor did it reach operational capacity, in line with the agreed timelines (chapter 4). The Commission regards the slippage against the original COAG timelines as a lesson, rather than a failure. With the benefit of hindsight, it is clear that the timetable for reform was too ambitious. Harmonising regulation across jurisdictions can be a drawn out process requiring negotiations between governments. Timelines agreed at the start of the process may be unrealistic in practice. An incremental approach that incorporates trials and pilots is likely to deliver smoother transition than ‘big bang’ changes.

Roles and responsibilities

The NHVR was established by section 656 of the HVNL and its roles and responsibilities are codified in sections 3 and 4 (box 5.3). These roles and responsibilities reflect the IGA objectives — promoting safety and productivity and managing the environmental and amenity impacts of road transport.

Governments have given the NHVR a broad and challenging set of responsibilities. The regulatory framework established by the HVNL tasks the regulator with data collection, standard setting, enforcement, issuing permits for road access and accreditation of alternative approaches to regulatory compliance. The legislation and regulation prescribe requirements in matters including mass limits, vehicle loading and fatigue management.

Governments chose to include highly detailed requirements in the HVNL. For example, the section of the legislation dealing with vehicle mass, dimensions and loading covers 83 pages; the section on driver fatigue extends to 120 pages. Some inquiry participants were critical of the level of detail in the legislation.

The HVNL is a poor piece of legislation. In particular the HVNL is different in scale and style from comparable laws. The HVNL is unduly large and highly prescriptive, with a lot of detail in the primary legislation. (Natroad, sub. 7, p. 4)

The HVNL comprises more than 800 sections and is supported by five sets of regulations. Together these provisions can be inconsistent in approach, difficult to read and interpret, onerous for industry to comply with and difficult for the National Heavy Vehicle Regulator (NHVR) to administer. (ALGA, sub. 34, p. 10)

Box 5.3 Object of the Heavy Vehicle National Law and regulatory framework

Section 3 of the *Heavy Vehicle National Law Act 2012* (Queensland) (the HVNL) establishes the object of the Law.

to establish a national scheme for facilitating and regulating the use of heavy vehicles on roads in a way that —

- (a) promotes public safety; and
- (b) manages the impact of heavy vehicles on the environment, road infrastructure and public amenity; and
- (c) promotes industry productivity and efficiency in the road transport of goods and passengers by heavy vehicles; and
- (d) encourages and promotes productive, efficient, innovative and safe business practices.

Section 4 of the HVNL sets out the regulatory framework to achieve the object of the Law.

The object of this Law is to be achieved by a regulatory framework that —

- (a) establishes an entity (the National Heavy Vehicle Regulator) with functions directed at ensuring the object is achieved; and
- (b) provides for a database of heavy vehicles; and
- (c) prescribes requirements about the following —
 - (i) the standards heavy vehicles must meet when on roads;
 - (ii) the maximum permissible mass and dimensions of heavy vehicles used on roads;
 - (iii) securing and restraining loads on heavy vehicles used on roads;
 - (iv) preventing drivers of heavy vehicles exceeding speed limits;
 - (v) preventing drivers of heavy vehicles from driving while fatigued; and
- (d) imposes duties and obligations directed at ensuring heavy vehicles and drivers of heavy vehicles comply with requirements mentioned in paragraph (c)(i) to (v) on persons whose activities may influence whether the vehicles or drivers comply with the requirements; and
- (e) includes measures directed at the matters mentioned in section 3(c) and (d) by allowing improved access to roads in certain circumstances, including by —
 - (i) allowing heavy vehicles, that would otherwise be prevented from being used on roads, access to the roads through exemptions or authorisations granted in circumstances in which the matters mentioned in section 3(a) and (b) will not be compromised; and
 - (ii) providing for accreditation schemes allowing operators of heavy vehicles who adopt best practices directed at the matters mentioned in section 3 to be subject to alternative requirements more suited to the operators' business operations.

The Australian Trucking Association commented that the flaws were the result of the process of developing the HVNL.

So the problem we have with the HVNL is, unlike the Rail Safety National Law, which was written from scratch, the HVNL is essentially a paste-up job of multiple sets of model regulations which were written as regulations, not as a primary act. So in, you know, the states they were typically imposed as legislative instruments, as regulations, and they were not brought together and made consistent. So, we have an overly complex primary act and a lack of flexibility for the regulator to simplify the law, because doing that requires the agreement of all of the governments involved and an extensive legislative process which is — it's a challenging task to undertake. (trans., p. 145)

The level of prescription in the legislation has frustrated achieving the IGA objectives of seamless national regulation and consistent and streamlined administration and service provision. The NHVR commented on the effects of the legislation on its operations.

We are moving towards the concept of a modern regulator, a regulator which really starts to embrace and understand how this industry does work and it is a diverse and complex industry. There are players in this industry that generally want to do the right thing, be it from a safety aspect or in terms of both the productivity benefits that come from their operations and, unfortunately, I think we have a legislative framework that restricts that. (trans., p. 77)

The Motor Trade Association of SA/NT (MTA) agreed that the legislation is an impediment to flexible approaches to regulation.

The MTA agrees that the HVNL does not have the flexibility needed to regulate the diversity of freight types and tasks and differing compliance capacities of operators. (sub. DR47, p. 6)

The governments of Western Australia and the Northern Territory have opted to remain outside of the HVNL at least partly because of the prescription in the legislation.

The National Transport Commission (NTC) is reviewing the HVNL and has identified many problems, including that 'the prescription and complexity of the HVNL presents challenges for governments and regulators administering the law' (NTC 2019, p. 39). The Commission's recommendations for productivity enhancing reforms to heavy vehicle regulation are set out in chapter 10.

FINDING 5.1 – THE HEAVY VEHICLE NATIONAL LAW IS EXCESSIVELY PRESCRIPTIVE

The Heavy Vehicle National Law is excessively prescriptive and limits the scope for operators to use innovative approaches to manage safety risks.

A greater emphasis on outcomes-focused approaches to legislation and regulation would improve road safety, reduce the burden of compliance and administration, and increase the efficiency of road transport. The National Transport Commission, which is reviewing the Heavy Vehicle National Law, is well placed to recommend improvements to the Transport and Infrastructure Council.

Powers

The NHVR does not yet have the full suite of powers to carry out all of its functions. The largest of the participating states have not yet transferred all regulatory services to the NHVR — New South Wales, Victoria and Queensland are scheduled to transfer their services to the NHVR by 2020-21 (NHVR 2020).

The staggered transfer of responsibilities to the NHVR is sensible. The experience with restricted access vehicle permits shows that there are risks in transferring national regulatory responsibilities from all participating jurisdictions at once to a new national regulator. Nevertheless, the drawn-out process for transferring functions to the national regulator has delayed the achievement of national regulation. Transferring enforcement powers and resources to the NHVR is an essential step in achieving the IGA objectives (recommendation 4.2).

Capability

The NHVR has built its staffing and information capabilities over time and is increasingly capable of carrying out its roles and responsibilities, subject to the constraints arising from the transfer of functions from State and Territory governments.

IT capabilities — permits for restricted access vehicles

On 10 February 2014, the NHVR took over responsibility for granting access permits for restricted access vehicles. The national regulator was overwhelmed by permit applications, its permit processing collapsed and four days later participating State and Territory governments requested the NHVR to delegate responsibility for processing certain applications (particularly intra-state) to the relevant State and Territory authorities (except Tasmania).

The NHVR conducted a review of the process and put in place initiatives to remedy the situation. It has resumed processing for all participating states and territories through a purpose-built IT system. The NHVR is also having some success bringing the numbers of applications down by working with road managers to issue notices allowing as-of-right access.

The Australian Trucking Association praised this aspect of the NHVR's work.

The NHVR got off to a very shaky start with permits, but since then we've seen the NHVR gradually get on top of the permit issue they had, and the NHVR are doing really great work on their computerised portals for business, and also on streamlining the permit and access systems as much as they can within the law. (trans., p. 145)

With hindsight it is clear that the participating governments underestimated the time and resources needed to plan and deliver the new arrangements. The agencies responsible for implementing the system should have foreseen the potential scale of the task and the risks, and staggered the transfer of responsibilities to the new national regulator.

Recent improvements in data and analytical capability

In the early years of its operations, the NHVR did not have the information or analytical capabilities to fulfil all of its functions. Initially the NHVR faced legacy issues — State and Territory governments had not collected information in a consistent manner, so the NHVR did not have a nationally-consistent database to draw on. The lack of information and analysis was (and remains) an impediment to the NHVR taking a risk-based approach to compliance and enforcement and complicates the task of assessing whether the national reforms have improved safety and productivity.

The NHVR has made inroads into better information gathering and analysis in the past two years. In 2017-18 the NHVR completed its ‘Intelligence Capability Framework’ explaining its approach to gathering, managing and analysing information (NHVR 2018). This framework is a positive step that will facilitate increased adoption of risk-based regulatory practices and policy development.

The NHVR could improve its data collection, analysis and publication about safety risks and outcomes. The ONRSR annual *Rail Safety Report* is the benchmark. That report presents data on the number of railway-related fatalities and serious injuries, as well as incidents the regulator regards as ‘important precursors to collisions and derailments’ (ONRSR 2018e, p. 21). Similar information for heavy vehicles would be a useful input into a more risk-based approach to regulation.

RECOMMENDATION 5.1 – ANNUAL HEAVY VEHICLE SAFETY REPORT

The Transport and Infrastructure Council should direct the National Heavy Vehicle Regulator to collect data on key safety risks and outcomes and publish the data each year in a similar form to the Office of the National Rail Safety Regulator’s annual *Rail Safety Report*.

The NHVR has adequate financial resources

The NHVR’s revenue sources are adequate to fund its operations. It had a surplus of about 30 per cent of retained earnings in the 2017-18 financial year. The NHVR is primarily funded by registration charges of heavy vehicles in participating jurisdictions. In 2018, around 90 per cent of NHVR funding was attributed to ‘regulatory income’ that is collected by State and Territory agencies on behalf of the NHVR. The Australian, State and Territory governments also provide ‘unconditional government contributions’, which accounted for around 5.6 per cent of NHVR funding in 2018. Revenue from fees accounts for about 3 per cent of funding (NHVR 2018).

The NHVR has argued that uncertainty about the costs of transitioning New South Wales and Queensland, along with its reliance on an income stream that fluctuates with economic activity, warrants healthy retained earnings. Over time, if the NHVR continues to retain

substantial surplus earnings, it should explore options to reduce the cost of compliance to industry through reducing fees, charges and the regulatory income collected by State and Territory agencies.

Governance

The NHVR reports to responsible Ministers from participating governments and is overseen by a board (box 5.4). The board structure established through the HVNL is consistent with good corporate governance practices. Some inquiry participants observed that some board members have links to industry that could create perceptions of conflicts of interest. Having board members with industry experience is beneficial, although excessive representation from any sector could reduce the effectiveness of board decision making.

Box 5.4 Governance of the National Heavy Vehicle Regulator

The National Heavy Vehicle Regulator (NHVR) reports directly to 'responsible Ministers' who are appointed by each participating state and territory, plus the Commonwealth responsible Minister. The NHVR Board, established under section 662 of the Heavy Vehicle National Law Act, comprises 5 members appointed by the Queensland Minister on the unanimous recommendation of the responsible Ministers. The Board is responsible for deciding NHVR policies (subject to directions from responsible Ministers), and ensuring that the NHVR exercises its functions in a proper, effective and efficient way (NHVR 2019b).

Section 663 of the Act specifies that the NHVR Board must consist of:

- at least 1 member who has expertise in transportation policy; and
- at least 1 other member who has expertise in economics, law, accounting, social policy or education and training; and
- at least 1 other member who has experience in managing risks to public safety arising from the use of vehicles on roads; and
- at least 1 other member who has financial management skills, business skills, administrative expertise or other skills or experience the responsible Ministers believe is appropriate.

In addition:

Of the members of the Board, one is to be appointed by the Queensland Minister, on the unanimous recommendation of the responsible Ministers, as the Chairperson of the Board and another as the Deputy Chairperson.

The Australian Trucking Association proposed an alternative approach to heavy vehicle regulation that includes a simplified HVNL, more flexible options for compliance and more risk-based enforcement.

The legislative model we are proposing would increase the workload and discretion of the regulator. This increase in the regulator's authority would need to be matched by corresponding improvements in its corporate governance, oversight and accountability. (ATA, sub. 32, p. 14)

The Association stated that under its proposed model it would be appropriate to:

- increase the size of the board from five to nine, and
- require that at least two of those members have recent experience operating a truck or bus business, either as a director or as an employee. (ATA, sub. 32, p. 15)

The constitution of the NHVR board is a matter for the NTC to consider in its review of the HVNL. Increasing board resources might be appropriate if legislative changes increase the regulator's workload. On the other hand, a larger board might prove unwieldy. The prudent approach would be to provide for discretion over the size of the board, such as requiring that it comprise between 5 and 9 members, depending on medium-term operational requirements.

Regulator behaviour

Inquiry participants were generally positive about the NHVR's approach to regulation, service delivery and engagement.

Flexible approaches to regulation

The greatest impediment to the NHVR taking more flexible approaches to regulation is the inclusion of prescriptive clauses in the legislation. The Australian Trucking Association stated that this prescription leads to risk aversion.

The problem now is the law, and I'd like to give the Commission an example relating to the current bushfires. Police and emergency services are able, in an emergency, to pretty much direct a heavy vehicle to do whatever they think necessary and, you know, we would argue that's an entirely appropriate power that police and emergency services have. What we saw in the bushfires is that risk averse police officers and emergency services officers were phoning the NHVR call centre wanting permits for those vehicles as well as issuing directions to the vehicles out of a sense of risk aversion. Now, I don't believe the NHVR wanted to issue those permits. I'm sure the NHVR had other things to do. The police, the emergency services, and the trucking operators involved should not have needed to engage in it.

So, this is again a problem with the law, not a problem with the NHVR, because I'm sure their call centre staff simply said "Of course. Do whatever you think is necessary. Just do it." Yet, out of a sense of risk aversion, the police and emergency services felt obliged to secure permits. All of this regulation is unnecessary. It doesn't add to safety, it doesn't add to community amenity, and it just hampers everyone's efforts to be more productive. (trans., p. 146)

This example illustrates how the form of legislation can influence the culture of enforcement, and that prescriptive regulation can create incentives for pettifogging bureaucracy, even in the context of emergencies.

Service delivery and stakeholder engagement

The NHVR has regulatory relationships with about 40 000 road freight businesses, operating about 900 000 vehicles (NHVR 2019a). NatRoad commented on the number of industry bodies that the NHVR must deal with.

As to accountability, the NHVR's consultative mechanisms suffer because the industry has too many representative bodies which often do not promote consistent policies. That is not generally the fault of the NHVR, but it means that representation on its consultative bodies and the processes it uses for consultation often do not cut through to industry members. (NatRoad, sub. 7, p. 14)

Transport industry bodies, transport users and governments made positive comments about the NHVR's engagement with stakeholders (box 5.5).

Box 5.5 Participants' comments on the NHVR's stakeholder engagement

The Australian Local Government Association (ALGA) stated that engagement with local government had improved since the failed transfer of vehicle access permit responsibilities to the National Heavy Vehicle Regulator (NHVR) in 2014.

Since that difficult time, slowly but steadily the NHVR management has improved its processes and improved cooperation with ALGA and the local government sector generally. For example, increasingly, Heavy Vehicle Local Council Access forums are being held. These joint NHVR/local council access forums continue to improve access and understanding. (ALGA, sub. 34, p. 11)

NatRoad stated that the NHVR has engaged successfully with the industry on some issues.

The forums that it organised for explaining to industry the new COR [Chain of Responsibility] laws was, however, a very useful and successful means of communication and NatRoad supports this method of direct engagement with the industry. (NatRoad, sub. 7, p. 14)

The National Farmers' Federation stated that it had worked closely with the NHVR on some matters.

We worked closely with the National Heavy Vehicle Regulator (NHVR) and relevant jurisdictions in the drafting of a National Class 1 Agricultural Vehicle and Combination Notice. We also worked with NHVR on increasing awareness of changes to Chain of Responsibility requirements. (NFF, sub. 36, p. 2)

Engagement with drivers

Inquiry participants were generally positive about the NHVR's engagement with drivers, particularly compared with their experiences with police. The South Australian Freight Council stated that NHVR officers are better trained than general duties police on heavy vehicle laws and are more likely to take a flexible, risk-based approach to enforcement.

NHVR and specialist heavy vehicle branch police officers are trained to a high standard, and have the inbuilt experience benefit of operating with the law every day. General duties police officers do not — while they may have had some training, they are not specialists and road interceptions of heavy vehicles likely constitute only a small portion of their work duties. Reports

from industry members indicate that these officers are more likely to charge for technical (non-safety related) breaches, and may interpret the law incorrectly. (sub. 6, p. 6)

Truck drivers who participated in the ‘truck stop’ days in regional Australia generally agreed that their experiences with NHVR officers were more positive than their engagement with police. The drivers stated that NHVR officers tended to be more efficient than police in carrying out inspections, which reduced delays. They also stated that NHVR officers generally took a more ‘educational’ approach, whereas many state and territory police officers focused on compliance and enforcement.

Summing up

The transition to national regulation of heavy vehicles is not yet complete. The HVNL establishes a broad scope of operations for the NHVR and the Australian, State and Territory governments have, sensibly, chosen to stagger the development of the regulator’s operations.

The NHVR operates under substantial constraints. In particular, the HVNL constrains the regulator’s ability to take flexible and risk-based approaches to regulation across its operations. The NTC review of the HVNL presents an opportunity to improve the legislation.

In spite of these constraints the NHVR is developing in a way that will enable it to achieve the delivery of the COAG IGA objectives across the full scope of its operations within a reasonable timeframe.

5.3 The Office of the National Rail Safety Regulator

Of the national transport regulators, ONRSR is the closest to achieving the IGA objective of consistent national regulation. Inquiry participants were generally positive about ONRSR’s performance (box 5.6).

The policy framework

ONRSR commenced operations in January 2013, after the passage of the *Rail Safety National Law Act 2012* (South Australia) (RSNL). ONRSR is headquartered in Adelaide and has offices in capital cities. State and Territory governments joined the national regulatory regime at different times. Victoria was the final jurisdiction to join when its service-level agreement with ONRSR expired in December 2019 (DITCRD, sub. DR74, p. 5).

As at June 2019 ONRSR regulated 185 accredited operators, including above- and below-ground operators. In 2017-18, these operators undertook 139.5 million passenger train kilometres and 85 million freight train kilometres on 44 000 kilometres of track (ONRSR 2019b).

Box 5.6 Participants' comments on ONRSR's performance

Inquiry participants were generally positive about ONRSR's performance.

ONRSR has demonstrated strong commitment and leadership to improving rail safety. (FORG, sub. 8, p. 5)

RISSB believes the establishment of ONRSR has had a positive impact on rail safety in Australia. (RISSB, sub. 9, p. 7)

Industry members are broadly satisfied with the ... Office of the National Rail Safety Regulator (Australian Logistics Council, sub. 12, p. 1)

Arc acknowledges that despite some difficulties during the transitional phase, ONRSR is maturing into a competent and efficient regulator, and ONRSR's focus on responsiveness and continuous improvement should be commended. (Arc Infrastructure, sub. 17, p. 4)

The establishment of the ONRSR has been beneficial in introducing one national conversation on rail safety, as opposed to dealing with each State individually. (Freight and Logistics Council of Western Australia, sub. 22, p. 5)

ARA [Australian Railways Association] members have indicated that the creation of ONRSR has led to some notable benefits. (ARA, sub. 26, p. 17)

On balance, the introduction of the Rail Safety National Law (RSNL) and the establishment of the Office of the National Rail Safety Regulator (ONRSR) has yielded tangible benefits and improvements in regulatory practice. (Aurizon, sub. 30, p. 3)

[T]he formation of the Office of National Rail Safety Regulation (ONRSR), and the move towards nationally consistent regulation, has reduced the regulatory burden on its [Australian Rail Track Corporation] business. (ARTC, sub. 31, p. 3)

Roles and responsibilities

ONRSR's objectives were codified consistently across the original IGA (COAG 2011c), the RSNL and ONRSR's most recent statement of intent. These objectives include:

- to facilitate the safe operation of rail transport in Australia
- to exhibit independence, rigour and excellence in carrying out its regulatory functions
- to promote safety and safety improvement as a fundamental objective in the delivery of rail transport in Australia (ONRSR 2018f).

The COAG Regulation Impact Statement set out ONRSR's roles and functions (box 5.7).

The regulator's functions are detailed in the IGA, the RSNL, and the most recent statement of intent. The functions are not always written consistently and there is some overlap with the roles and responsibilities set in the IGA. Although not ideal, the inconsistencies do not appear to create any contradictory expectations about ONRSR's objectives or methods and participants did not express any concern with how ONRSR carries out its functions.

The RSNL enables ONRSR to take a risk-based, and co-regulatory, approach to safety regulation. This approach pre-dates the national system — the previous Model Law and State and Territory regulators also took a co-regulatory approach. Participants strongly endorsed co-regulation (Arc Infrastructure, sub. 17, p. 4; Freight and Logistics Council of Western Australia, sub. 22, p. 5; ONRSR, sub. 21, p. 5; SAFC, sub. 6, p. 2; RISSB, sub. 9, p. 3).

Box 5.7 **ONRSR's role and functions**

Role

The NRSR [National Rail Safety Regulator] will:

- (a) administer the national rail safety law and perform the functions and responsibilities conferred/imposed on it by that law;
- (b) secure compliance with the national rail safety law through effective and appropriate compliance and enforcement measures;
- (c) promote improvement of the safe carrying out of railway operations;
- (d) ensure railway operators manage risks associated with their railway operations;
- (e) promote public confidence in the safety of railway operations;
- (f) undertake cost benefit analysis where mandatory decisions have a significant impact on industry; and
- (g) consult with the ATSB [Australian Transport Safety Bureau] where appropriate and practicable to do so.

Functions

In administering the national rail safety law, the NRSR will:

- (a) administer, audit and review the accreditation regime under the national rail safety law;
- (b) work with rail transport operators, rail safety workers and others involved in railway operations to improve rail safety in Australia;
- (c) research, collect and publish information relating to rail safety;
- (d) provide, or facilitate the provision of, advice, education and training in relation to rail safety; and
- (e) monitor, inspect, investigate and enforce compliance with the national rail safety law.

Source: Council of Australian Governments (2011c, pp. A1–A2).

Should ONRSR have a productivity objective?

Some inquiry participants suggested that, in addition to its safety functions, ONRSR should also be responsible for promoting productivity in rail transport (as the NHVR is required to do under the HVNL). Like all regulators, ONRSR is required to have regard to industry productivity and not unnecessarily create regulatory burdens or impediments to innovation (chapter 2). Some participants stated that this should be the extent of ONRSR's productivity mandate (Arc Infrastructure, sub. 17, p. 10; RISSB, sub. 9, p. 8). Participant feedback suggests that the regulator is meeting these requirements (box 5.8).

Other inquiry participants wanted ONRSR to take a more active role in promoting rail industry productivity. Aurizon's submission was representative of the general idea.

In supporting the idea of the ONRSR having an extended remit that includes a productivity and innovation objective, the issue for Aurizon is not one of actions that have been taken by the regulator. Rather, we take the view that there are opportunities to contribute to productivity improvement in rail transport and that could be pursued but are not comprehensively pursued at present due to the limited remit of the regulator. (sub. DR78, p. 3)

Box 5.8 ONRSR is required to minimise impediments to productivity**Consider the benefits and costs of regulation**

Under the rail intergovernmental agreement, one of ONRSR's roles is to 'undertake cost benefit analysis where mandatory decisions have a significant impact on industry' (COAG 2011c, p. A1). ONRSR noted that this clause in the IGA has been codified into the Rail Safety National Law.

... we also have elements in the law which actually requires that if I as a regulator am requesting a rail company to do something that would really impede financially that organisation, and there are no major safety benefits, in other words the cost benefit is not there, under the law that can be challenged and a rail company can actually challenge that decision, and therefore there is a requirement for then a cost benefit analysis to be undertaken and for the decision to be reviewed and looked at. (trans., pp. 15–16)

Minimise impediments to new technologies

The rail intergovernmental agreement stated that ONRSR is required to 'promote improvement of the safe carrying out of railway operations'. Arc Infrastructure stated:

ONRSR effectively supports the adoption of emerging technology by responding to developments in a timely fashion. (sub. DR57, p. 4)

Inquiry participants identified barriers to increasing rail productivity, including differences in network rules, gaps in infrastructure networks and interoperability of communications and other systems. Many parties will contribute to increasing rail productivity. In January 2020, the NTC published the *National Rail Action Plan* (NTC 2020), an element of the *National Freight and Supply Chain Strategy*. The plan sets out actions across five priority areas: skills; common standards for infrastructure, rolling stock components and safe work; and interoperable communication and control systems. The NTC identified entities to progress elements of the plan, including the Rail Industry Safety and Standards Board (RISSB), the NTC, industry, State governments and various working groups. It did not identify a specific role for ONRSR. The Commission broadly agrees with the allocation of responsibilities and does not see any need to expand ONRSR's productivity remit beyond the general obligation to minimise the compliance burden and impediments to innovation.

ONRSR's relationship with RISSB

The RISSB is funded jointly by industry and governments and is responsible for developing standards, guidelines, codes of practice, rules and procedures for the rail industry. The documents that RISSB develop and maintain are intended to 'assist the rail industry to manage rail safety, improve efficiency and achieve safety outcomes through standardisation, interoperability and harmonisation' (RISSB, sub. 9, p. 2). They are an example of the 'acceptable means of compliance' that are essential for flexible approaches to regulation to work (chapter 2).

ONRSR, which is responsible for interpreting and enforcing the requirements of the law 'does not specifically endorse RISSB standards, but rather recognises the value of an

operator adopting [them] and any other standards including international standards in their safety management system’ (ONRSR, sub. 21, p. 44).

Some inquiry participants expressed concerns about the delineation of responsibilities between RISSB and ONRSR (ARA, sub. 26, p. 29; Arc Infrastructure, sub. 17, p. 7). One issue is the potential for duplication. For example, RISSB and ONRSR have both developed voluntary guidelines for operators to assist them to comply with their fatigue risk management obligations. Duplication can lead to inconsistency and confusion but, in a flexible system, there is room for more than one acceptable means of compliance.

The Rail, Tram and Bus Union stated that the ‘flawed relationship’ between RISSB and ONRSR is the ‘primary inhibiting factor’ to achieving ‘nationally consistent and harmonised outcomes’.

In many cases, RISSB has developed standards which, despite receiving the ONRSR’s endorsement, are effectively ignored by operators. Fundamentally, all that has been established is a national process to bring about a regime of national inconsistency. (sub. 10, p. 5)

The union stated that ‘the failure to achieve national standardisation of safe working rules’ (sub. 10, p. 5) is an example of this inconsistency.

In a flexible system operators would be expected to take different approaches to meeting their general duties to achieve safe operations. Non compliance with RISSB standards would only be a problem if rail operators did not take alternative approaches to safety risk management. Based on evidence about rail safety outcomes, the Commission is satisfied that ONRSR’s approach to RISSB standards is not leading to adverse outcomes and does not see any need for fundamental change to the relationship between the regulator and the standards-setting body.

Powers

ONRSR has a range of powers it can exercise to achieve operator compliance with the RSNL. The pre-RSNL Model Law (*National Transport Commission (Model Legislation – Rail Safety Bill) Regulations 2006*) introduced a ‘hierarchy of sanctions’ for regulators to secure compliance with legislation. These powers carried through to the creation of the RSNL and ONRSR.

Parts 4 and 5 of the RSNL deal with securing compliance and enforcement powers. Part 4 empowers ‘rail safety officers’ (effectively representatives of ONRSR) to conduct inspections free from hindrance. Part 5 details the range of tools ONRSR can use to secure compliance. Some other enforcement provisions can be found elsewhere in the legislation (for example, infringement notices have their own Part) (box 5.9).

Sitting above all of these powers is the RSNL’s direction to operators to report any ‘accident or incident that has, or could have, caused significant property damage, serious injury or death’ — a notifiable occurrence — to ONRSR (RSNL, section 4(1)). ONRSR (sub. 21, p. 36) stated:

ONRSR believes it has an appropriate range of enforcement measures, as detailed in Part 5 of the RSNL, to achieve its objectives.

The Commission agrees.

Box 5.9 **ONRSR’s tools for compliance**

ONRSR’s tools for compliance include:

- an improvement notice — a notice that directs a person or operator to remedy a particular safety risk
- a prohibition notice — a notice that prohibits activity that poses a safety risk
- a non-disturbance notice — a notice that requires a person or operator to facilitate rail safety officers exercising their powers (for example, preserve the site of a notifiable occurrence)
- an infringement notice — a notice that signals ONRSR believes that a person or operator has breached one of a range of provisions
- a directed amendment of a safety management system — ONRSR can direct an operator to amend their safety management system
- an enforceable undertaking — an agreement between ONRSR and an operator to carry out specific activities to remedy a contravention or suspected contravention
- a condition or restriction of accreditation or registration
- a suspension of accreditation or registration
- cancellation of accreditation or registration
- prosecution.

Source: ONRSR (2018g).

Capability

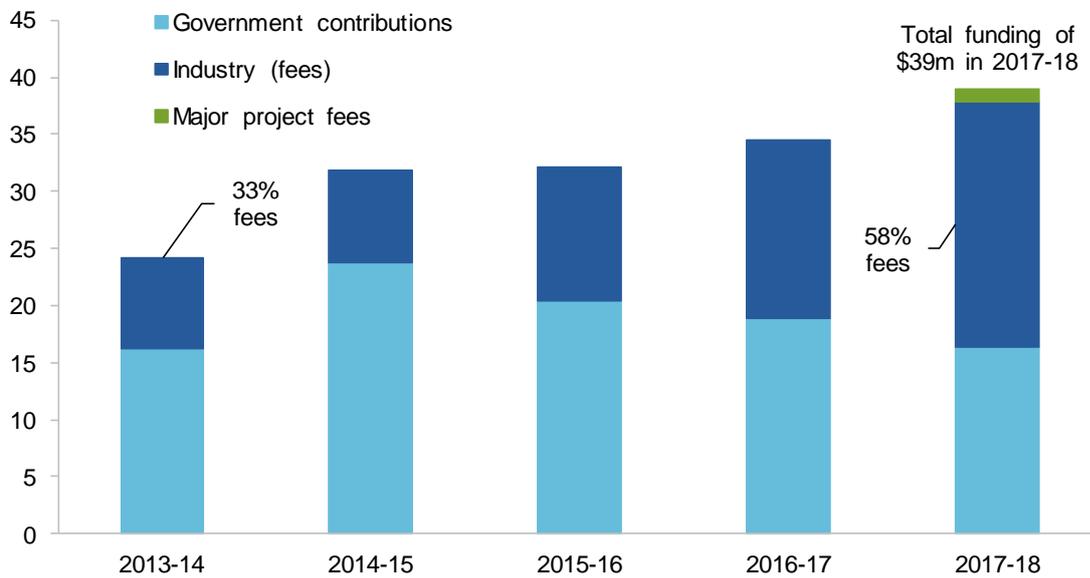
Financial capability

The original IGA stipulated that all ongoing costs of ONRSR were to be shared across States and Territories through a combination of cost recovery from industry and government contributions. The RSNL established the National Rail Safety Regulator Fund to facilitate funding of ONRSR’s activities. Sections 76 and 95 of the RSNL require operators to pay annual fees to ONRSR, and section 3 requires that these fees are reasonable. These fees have fixed and variable components; the variable component depends on an operator’s number of trains or track kilometres (ONRSR 2018d). In 2016, following a review by ONRSR, the COAG Transport and Infrastructure Council (TIC) approved a separate fee for major

projects, given they require extra regulatory effort by ONRSR that would not necessarily show up as more trains or track kilometres.

Since its inception, as ONRSR’s responsibilities have increased, its annual revenue has increased 61 per cent from \$24 million to \$39 million. During this time, the share of revenue sourced from industry fees has increased from 33 per cent to 55 per cent (figure 5.1). ONRSR stated that in 2019-20 ‘governments will contribute \$14m (or 37 per cent) towards the cost of rail safety regulation’ (sub. DR68, p. 1).

Figure 5.1 ONRSR’s revenue has increased with new responsibilities
\$m by source, 2013-14 to 2017-18



Sources: ONRSR (2014, 2015, 2016, 2017a, 2018a).

ONRSR (sub. 21, p. 5) claimed that it is ‘operating in a financially responsible manner’, and no statements were made to indicate that the quantum of funding was inadequate to achieve its regulatory task.

Before the national system, the degree of cost recovery ranged from 9 per cent to 100 per cent across jurisdictions. To assist with the transition, government contributions have reduced by 5 per cent each year in each jurisdiction, with three jurisdictions already 100 per cent industry funded (ONRSR, sub. 21, p. 29).

This transition from government to industry funding, combined with occasional changes to the industry funding model, has seen the fees paid by some operators fall and some rise. However, this simply reflects the transition to a more efficient, cost-recovery model. No operators submitted that their individual fees were a particular concern.

The Australasian Railway Association (ARA) (sub. 26, p. 37) raised two concerns with the model itself: that track and train kilometres is a poor proxy for regulatory effort and risk, and that changes to the funding model should not have to be approved by TIC. On the first concern, as acknowledged by the ARA, the TIC has approved ONRSR to undertake further work to better align annual fees with regulatory effort and risk (ONRSR 2017b). On the second concern, the Commission considers that matters of fiscal appropriation are a matter for elected representatives.

Staff

ONRSR employs 144 staff. Since its inception, ONRSR has hired more staff as more states and territories have come under its remit. The Commission understands that the process of taking on State and Territory government staff has led to some duplication of roles and overstaffing. However, once staff employed under previous service-level agreements are factored in, ONRSR (sub. 21, p. 5) stated that the actual number of staff employed to undertake rail safety regulatory activity has been ‘relatively static’ since inception.

Some participants raised concerns about ONRSR staff capability. For example, Aurizon (sub. 30, p. 5) noted that it is common to ‘experience inconsistency of approaches ... within and between state offices’. Some participants stated that the move to national regulation has led to trade-offs between local knowledge and access to broader skillsets (ARA, sub. 26, p. 11). WA-based Arc Infrastructure (sub. 17, p. 11) suggested that local ONRSR staff lack the understanding needed to meaningfully engage with their operations. The Commission understands that a large number of State government staff in Western Australia retired rather than joining ONRSR, which might explain a shortage of local expertise.

Some workforce capability issues are related to the development of the national regulator and the staggered handover of regulatory responsibilities by State and Territory governments. The ARA stated that the goal of ‘sufficient capability and expertise’ has been ‘partially achieved’ (sub. 26, p. 10) and Arc Infrastructure acknowledged recent improvements and ONRSR’s focus on continuous improvement (sub. 17).

ONRSR planned for the challenges of building its workforce capabilities and developed a workforce plan to smooth the transition of new staff and to match their capabilities to organisational needs (ONRSR 2016). The 2018-19 annual report stated that ONRSR completed the delivery of its workforce plan in December 2019 and that it had created a new workforce plan focused on ‘maintaining a capable, efficient and effective workforce’ (ONRSR 2019a, pp. 26–27). Building and maintaining a capable workforce is an ongoing challenge for all regulators. Given its effectiveness to date, the Commission does not regard ONRSR’s workforce capabilities as an area for concern.

Information and analytical capability

ONRSR collects data on individual operators' risks from multiple sources, including operator reporting, third party reports and other interactions with industry (ONRSR 2018g). It has established new data systems and a website portal that helps operators lodge information (ONRSR, sub. 21, p. 5). ONRSR has used this information to develop a model that gives each accredited operator a risk score. This score is then used to inform regulatory activities (ONRSR, pers. comm., 4 June 2019).

ONRSR has also put substantial effort towards collating industry-level datasets that help it identify broad trends. These data are published in the regulator's Rail Safety Report series (ONRSR 2018e). The regulator also conducted a stakeholder survey in 2016 and 2018. The 2018 survey found that 70 per cent of stakeholders thought ONRSR has been effective or very effective at improving data and information on safety risks (ONRSR, sub. 21, p. 37).

ONRSR (2018b) released the *National Rail Safety Data Strategy 2018–2022*. ONRSR elaborated:

The National Rail Safety Data Strategy has been developed as a partnership between ONRSR, the ARA and rail industry representatives to achieve relevant, consistent and quality national rail safety data that is readily available to stakeholders. (sub. 21, p. 6)

ONRSR appears to have good systems in place to produce the information it needs to be effective and also seems committed to continual improvement of these systems.

Governance

ONRSR is structured differently to the NHVR and AMSA in two respects. First, the national rail safety regulator is a person (the CEO of ONRSR) whereas for heavy vehicles and domestic commercial vessels (DCVs) the regulator is a body corporate. Second, the NHVR and AMSA have boards of five and eight independent members respectively. (The CEO also sits on the AMSA board.) ONRSR's legislation establishes an 'Office' that consists of three members — the regulator (who is also the CEO of ONRSR) and two independent members (box 5.10). The Office has some 'board-like' functions and in some corporate publications ONRSR refers to the Office, somewhat misleadingly, as 'the board', but it is not a board under the legislation.

ONRSR also has an executive team and staff. Its Corporate Plan 2018–2021 describes their role.

The Chief Executive is also supported by an Executive team comprising Executive Directors and the Senior Manager Risk and Analysis. Delivery of operational regulatory functions is undertaken by staff either directly employed by ONRSR or working via a service level agreement. Operational staff in each state provide national rail safety regulation tailored to local contexts. (ONRSR 2018c, p. 3)

Pacific National commented on the differences between the structures of ONRSR and the NHVR.

As well as having an official productivity mandate, the NHVR also benefits greatly from the leadership and governance structure of a board comprised of prominent Australians who are very active in encouraging expansion of the trucking sector. ... In contrast, ONRSR lacks a traditional board structure, for instance, of the seven members of the board, five are ONRSR executives. (sub. DR62, p. 5)

Box 5.10 Legislative basis of ONRSR's governance structure

Under section 17 of the *Rail Safety National Law Act 2012* (South Australia) the National Rail Safety Regulator ('the Regulator') is one person. The Regulator is the chief executive of the Office of the National Rail Safety Regulator (ONRSR) and exercises 'the functions of ONRSR conferred on the Regulator under this Law or an Act' (s. 19).

ONRSR is established under section 12 of the Act. Under section 16 of the Act, ONRSR consists of three people. (The executive and staff are not formally part of the 'Office'.)

(1) ONRSR consists of —

- (a) a person appointed by the South Australian Minister acting on the unanimous recommendation of the responsible Ministers as the National Rail Safety Regulator (the Regulator); and
- (b) 2 non-executive members (full-time or part-time) as are appointed by the South Australian Minister acting on the unanimous recommendation of the responsible Ministers.

Section 14 of the Act establishes that ONRSR is independent.

Except as provided under this Law or an Act, ONRSR is not subject to Ministerial direction in the exercise of its functions or powers.

Source: *Rail Safety National Law Act 2012* (South Australia).

This statement is not a strictly accurate description of ONRSR's formal structure — as noted above, the legislation does not establish a board and the ONRSR executive does not have an official role in ONRSR's governance (although the ONRSR website implies that it does). However, Pacific National's point does have merit; capable independent board members can improve decision making and accountability. Two non-executive members of a three person Office cannot provide the breadth of skills and experience that the NHVR and AMSA have on their boards. Governments could pass a simple amendment to section 16 (1)(b) of the *Rail Safety National Law Act* to increase the number of non-executive members of the Office from 2 to a maximum of 5 and to require that the members have a range of relevant skills and experience. It could also denote this Office of up to 5 members as an Advisory Board with one of the independent members to be the chair.

RECOMMENDATION 5.2 – GOVERNANCE OF ONRSR

The Transport and Infrastructure Council should endorse amendments to the *Rail Safety National Law Act 2012* (South Australia) to specify that the Office of the National Rail Safety Regulator be changed to an Advisory Board consisting of:

- up to 5 non-executive members, including members with experience in rail transport, risk management, financial management and business administration, one of whom would be chair
- the National Rail Safety Regulator.

Inquiry participants also raised concerns about the regulator’s relationship with the TIC. Under the RSNL, ONRSR is independent but ONRSR (2018g, p. 2) stated that it is ‘guided by the expectations of the Transport and Infrastructure Council to which it is accountable’.

Arc Infrastructure (sub. 17, p. 13) stated that influence from State and Territory governments creates a ‘challenging position’ for ONRSR as ‘competing state preferences make ONRSR’s task difficult’, the end result of which is ‘compromised policies’. ARA argued that:

ARA has concerns that ONRSR is not provided with sufficient freedom to achieve its legislative objectives ... (sub. 26, p. 3)

... projects relating to developing nationally-consistent approaches to regulation relating to alcohol and drug testing and fatigue have effectively been stymied. In part, this is because legislative change and/or change to regulations ultimately revert to the state and territory ministers. (sub. 26, pp. 28–29)

Aurizon (sub. 30, p. 5) also cited the fatigue, and drug and alcohol policy area, arguing that ONRSR is ‘at best a national coordinator of state-based preferences’. The Commission agrees that regulation is not nationally consistent in these areas. It has made recommendations with regard to derogations (recommendation 4.1) and fatigue management (recommendation 6.4) which, if implemented, would provide for more flexible approaches to achieving regulatory objectives.

Regulator behaviour

Flexible approaches to regulation

The flexible, outcomes-focused, co-regulatory approach established by the RSNL and carried out by ONRSR is consistent with the flexible approach to safety regulation set out in chapter 2. Overall, of the national transport safety regulators, ONRSR has implemented the most flexible approach to safety regulation.

Inquiry participants were generally positive about ONRSR's flexible approach, although Aurizon stated that the regulator has not implemented the co-regulatory approach in practice.

We support the objective of the ONRSR to provide for 'co-regulation'. This objective would, if it were to be implemented, involve an approach where risks are managed by the parties best able to do so. It would allow operators some flexibility to manage risks relating to their organisations and stakeholders while adhering to core guiding principles. As stated above, however, in practice much of the application of the RSNL involves a focus by the regulator on the enforcement of prescriptive requirements with little or no opportunity given to operators to manage the identified risks. (sub. DR78, p. 4)

Aurizon also acknowledged:

The inclusion of Queensland under the Rail Safety National Law (RSNL) and the transition of regulatory functions to the Office of the National Rail Safety Regulator (ONRSR) was implemented less than two years ago in Queensland. In some important areas, new regulatory approaches and practices are continuing to evolve. (sub. DR78, p. 3)

The Rail, Tram and Bus Union favoured a more prescriptive approach to safety regulation, including 'outer limits' on work hours as part of fatigue management regulation. It stated:

... the only way to achieve harmonisation is through the introduction of more prescriptive outer-limit regulations, a significant reform of the ONRSR-RISSB-Operator relationship and the introduction of penalty-based incentives to drive change. (sub. 10, p. 5)

Penalties exist under the current system but ONRSR's approach has been to use penalties to deter operators from conduct that could affect rail safety, not to achieve regulatory consistency. This is a sensible application of the available tools.

Replacing the RSNL with a more prescriptive approach would be overkill. RISSB and ONRSR have the capability to implement flexible approaches to regulation, within sensible limits. The focus on an outcomes-based system of co-regulation is fit for purpose and delivers good safety outcomes while not restricting the industry from its efforts (through technology and competition) to increase productivity.

Service delivery and stakeholder engagement

Inquiry participants stated that ONRSR consults effectively with industry and other regulators and made positive comments about the senior management of ONRSR.

In its 2016-17 stakeholder survey, 71 per cent of surveyed operators stated that ONRSR is effective in delivering its functions; 87 per cent stated that it is effective in delivering national rail safety reform objectives and 66 per cent agreed that 'ONRSR and the industry work co-operatively in a coregulatory environment' (ONRSR 2018a, p. 64).

Summing up

The RSNL enables ONRSR to take a flexible, risk-based approach to rail safety regulation. Within this framework ONRSR is an effective regulator and, of the three national transport regulators, ONRSR is closest to achieving the objectives of the COAG IGAs. Although the objective of seamless national regulation has not yet been achieved (largely due to derogations from the national law) the national regulator is establishing a consistent approach to regulation (chapter 4). Overall, rail transport in Australia remains relatively safe (chapter 6) and ONRSR has been proactive about promoting safety.

5.4 The Australian Maritime Safety Authority

AMSA took responsibility for service delivery as the national regulator for DCVs in 2018 and is less advanced than the NHVR and ONRSR in achieving nationally consistent regulation.

The policy framework

Roles and responsibilities

AMSA was established as the Australian Government's maritime regulator in 1990, responsible for search and rescue, control of ship-sourced marine pollution, safety regulation of maritime operations in Australia, and of Australian ships operating overseas (chapter 3). The *Marine Safety (Domestic Commercial Vessel) National Law Act 2012* (Cwlth) (MSNL) commenced on 1 July 2013, creating a single national system of regulation for DCVs. This substantially increased AMSA's responsibilities. AMSA estimated that as of January 2020 22 556 vessels were 'subject to some level of certification or permissioning under the National Law' (sub. DR71, p. 11) and that as many as 8693 vessels 'are subject to standing exemptions where no application or approach to AMSA is required' (sub. DR71, p. 12). The substantial increase in AMSA's responsibilities created challenges for the regulator.

Initially, State and Territory agencies were responsible for service delivery under the MSNL. AMSA described the process that led to AMSA taking responsibility.

A review of the national system in 2014 identified inconsistencies in jurisdictional service delivery as the cause of systemic inefficiencies that were preventing the realisation of the full benefits of the national system. To resolve this, Transport ministers decided in November 2014 that AMSA would assume full service delivery responsibilities for all domestic commercial vessels. (sub. 35, p. 3)

AMSA was scheduled to take responsibility for service delivery on 1 July 2017. In November 2016 the TIC announced that this would be extended until 1 July 2018. AMSA's service delivery responsibilities include:

- providing advice to operators, owners and seafarers
- safety education and support

-
- administering certificates and accreditation services (includes certificates of survey, certificates of operation, seafarer certifications and accreditation of marine surveyors)
 - compliance, enforcement and investigations
 - policy and standards development
 - safety management system verification.

A diverse group of operators

AMSA regulates a diverse group of vessel types and operators. The Maritime Union of Australia (MUA) described the variety of vessels that are under AMSA's remit.

The National Law regulates vessels covering the entire spectrum of floating transport from kayaks for hire to intrastate trading vessels, from water taxis to the Manly ferries, and every type of vessel and operation in-between. (sub. 37, p. 50)

Some DCV operators have the capability to take flexible approaches to safety risk management. Other operators have a single vessel and limited resources to devote to regulatory compliance. The diversity of the DCV fleet and its operators presents challenges for the regulator, which does not have good visibility of every type of commercial vessel.

Vessels that were under the Navigation Act

Before the introduction of the MSNL, vessels that operated in more than one jurisdiction could be regulated under the *Navigation Act 2012* (Cwlth). Some vessels (such as the *Spirit of Tasmania*) continue to be regulated under the Navigation Act despite being eligible for MSNL regulation. The MUA raised concerns that some vessels that had previously been regulated under the *Navigation Act* have been transferred to regulation under the MSNL. It stated that safety standards are higher under the Navigation Act, and crew training standards are lower.

Under the Navigation Act the Australian seafarers have got to go through 12-15 months training to become qualified in a graded ratings. Now, that's a significant difference to a couple of days' training to throw some — it could be a backpacker that's come out for a bit of work, throws two days' training in, jumps onto what was intended to work around the harbour or a river, and all of a sudden you're 200 miles out at sea on a domestic — on a commercial trading vessel. (MUA, trans., p. 33)

AMSA clarified that only a small number of vessels had moved from the Navigation Act to the MSNL.

... there would appear to be in the order of 40 vessels which we think have moved from *Navigation Act* into National Law, mostly in the tug area, and, generally, most of those tugs could have been under the state and territories anyway. Those operators usually kept them under the Nav Act so they could actually move them around the coast. (AMSA, trans., p. 229)

AMSA also disagreed that the move of vessels from the Navigation Act to the MSNL had reduced safety standards.

So I would not say that there has been a gross or a mass reduction of standards, in our view, and, in fact, some of the standards have increased. (AMSA, trans., p. 229)

The national regulator should continue to monitor the number of vessels that switch to the MSNL and assess whether the transfer leads to any increased safety risks. AMSA can recommend changes to DCV regulation, if necessary, but at this stage no further action is required.

Class 4 'hire and drive' vessels

Hire and Drive (Class 4) vessels are vessels that are used by the hirer for recreational purposes. They include fishing boats, jet skis and kayaks. AMSA does not hold data on all Class 4 vessels in operation but, of the vessels it has data on, Class 4 vessels account for about 11 per cent of the DCV fleet (Commission estimates based on AMSA (unpublished)). Similar vessels that are owner-operated are regulated by State and Territory agencies. The case for transferring Class 4 vessels to AMSA appears to rest on the fact that there is a commercial transaction involved.

The distinction between Hire and Drive vessels and identical, but privately-operated, vessels does not make sense from the perspective of safety regulation. Rented and owned vessels are subject to the same risks and should be subject to the same regulation. The commercial transaction is not a material factor in safety risks.

People who rent Hire and Drive vessels are already subject to some State and Territory maritime regulation, including licensing requirements and regulations around safety equipment, on-water behaviour and alcohol and other drugs. In Victoria anybody wanting to operate a business that hires out recreational vessels is required to hold a Hire and Drive Vessel Operator Licence and agree to have the vessel inspected by the Victorian agency responsible for maritime safety.

Safety incident data show that matters that are subject to State and Territory regulation pose the most serious safety risks. Data that AMSA provided to the Commission in February 2020 showed that over the period 2013-14 to 2018-19, there were seven fatalities associated with Class 4 vessels. (AMSA advised that these data could be subject to revision in the future.) Two were related to risks taken following excessive alcohol consumption, one was a collision of a rented jet ski and one fatality occurred when two moored vessels collided due to a gust of wind. Three fatalities were heart attacks. It is not clear that any of these risks relate to matters within AMSA's remit.

AMSA has a centralised, predominantly online and call-centre based approach to service delivery and does not have the on-water presence that State governments have to enforce safety regulation on rented recreational vessels.

... we still have the authorities in each state who are regulating recreational vessels, and, as I think I've said in the past and I've said to the state authorities, "You're on the water. You're looking at recreational vessels. What is the difference if someone has hired that thing that they're riding for a dollar versus if it's their own for recreational?", and there is a public expectation around that, I think. (AMSA, trans., p. 234)

In the draft report the Commission recommended that responsibility for regulating Class 4 vessels be returned to State and Territory governments. Some participants argued that state and territory regulation would not be consistent with effective safety risk management.

My gut feeling would be, unless the states have — or introduce a seaworthy certificate for every vessel — recreational vessel, domestic commercial vessel, anything that falls outside of AMSA's remit, anything at all — unless there's a seaworthy certificate it shouldn't go back to the states. It's too important. I don't even think recreational vessels should be able to change hands without somebody somewhere certifying that that vessel is seaworthy. (AIMS, trans., p. 204)

TSV [Transport Safety Victoria] does not agree that H&D [hire and drive] vessels could be regulated in a similar way to recreational vessels that are not used within a commercial arrangement. The risk controls required to effectively regulate H&D vessels are quite different. (TSV, sub. DR60, p. 1)

The Commission does not agree. The nature of the vessels, the safety risks associated with recreational vessels and the capabilities of AMSA and the State and Territory agencies all suggest that AMSA is not ideally suited to regulating Class 4 vessels, particularly in relation to enforcement. State and Territory agencies regulate the same vessel types when used for private purposes and have a larger presence on local waterways for enforcement. AMSA, by contrast, is better placed to oversee safety on larger DCVs. Further, most operators of Class 4 vessels would be expected to operate in a single location so the compliance cost savings arising from national consistency are very small.

The Department of Infrastructure, Transport, Cities and Regional Development (DITCRD) pointed out that transferring responsibility for Class 4 vessels would require agreement from all jurisdictions.

Legally, the proposal to return hire and drive vessels to the states and the Northern Territory would require unanimous agreement from the jurisdictions. (DITCRD, sub. DR74, p. 4)

The Government of Western Australia stated that returning Class 4 vessels to the States and Northern Territory was not justified (sub. DR81). The Northern Territory Government stated that it would not agree to take back responsibility for Class 4 vessels.

The Northern Territory considers that the responsibility for Class 4 Domestic Commercial Vessels (Hire and Drive), or any other function currently with AMSA, should remain the responsibility of AMSA. ... As a result of reforms, the Northern Territory Government also restructured its marine agency and regulatory regime to effect the move to national regulation. (NT Government, sub. DR64, p. 6)

These submissions suggest that governments are unlikely to agree to the immediate transfer of Class 4 vessels. Although it would be a less efficient outcome, the 'second best' approach

is for AMSA to coordinate with State and Northern Territory agencies to ensure that regulations that apply to Class 4 vessels are enforced and information on the Hire and Drive fleet is collected to identify any emerging risks.

FINDING 5.2 – STATE AND TERRITORY AGENCIES SHOULD REGULATE HIRE AND DRIVE VESSELS

Class 4 ‘Hire and Drive’ recreational vessels have more in common with recreational vessels (which continue to be regulated by State and Territory government agencies) than with other types of commercial vessels. The decision to transfer safety regulation of these vessels from State and Territory agencies to the national regulator was not justified on the basis of safety, or efficient or effective regulation. State and Territory government agencies are better placed to regulate these vessels than the Australian Maritime Safety Authority, particularly in relation to enforcement.

RECOMMENDATION 5.3 – RETURN HIRE AND DRIVE VESSEL REGULATION TO THE STATES

The Australian Government should negotiate with State and Territory governments to return responsibility for regulating Class 4 Domestic Commercial Vessels (Hire and Drive) to State and Territory agencies.

Powers

AMSA is responsible for implementing a number of Commonwealth Acts, which confer on the regulator a range of powers. These include education, warnings, detention (ordering that a vessel not be used), infringement notices (with financial penalties), improvement notices, prohibition notices (requiring immediate cessation of an activity), directions, undertakings, civil penalties and referral to the Commonwealth Director of Public Prosecutions for prosecution. It is also responsible for the National Standard for Commercial Vessels (NSCV) and can issue Marine Orders.

Enforcement and prosecution

Maritime Industry Australia Limited noted that AMSA has a reputation as an effective and strict regulator in its original remit of *Navigation Act* vessels.

It is important to note that AMSA is well known throughout the global shipping industry as having a zero-tolerance approach to non-compliance, and as a consequence, shipowners and charterers are very careful about the quality of the assets they send to Australian ports. AMSA’s sophisticated vessel targeting regime and active participation in the Tokyo MOU [memorandum of understanding], means that there is a high likelihood that substandard operators and poorly maintained or non-compliant ships will be detected and detained when in Australian waters. (sub. 14, p. 1)

The MUA was critical of AMSA's level of enforcement action, particularly the number of prosecutions under the national system for DCVs. The union observed that since 2013 '25 charges have been laid under the provisions of the National Law' (sub. 37, p. 52). It stated that some incidents did not lead to prosecution where 'it would be expected for incident and investigation reports to be made public and potentially charges to be successfully laid' (sub. 37, p. 52).

Regulators should make the decision to refer a matter for prosecution on a case-by-case basis, not to meet quotas. No evidence was provided to this inquiry that any particular incident should have led to a prosecution but did not.

AMSA stated in its *Compliance and Enforcement Policy* that it focuses on education.

AMSA places strong emphasis on engaging with, educating and assisting those with obligations under the maritime safety legislation to meet their obligations. AMSA chooses to administer the maritime safety legislation by placing emphasis on a proactive approach to encourage voluntary compliance through the provision of general guidance, education and training. (AMSA 2018b)

This is a sensible approach for dealing with operators who are moving from State and Territory regulation to a national system. Where AMSA identifies emerging risks it can escalate its enforcement response.

Marine orders and the National Standard

AMSA uses the NSCV and Marine Orders to codify standards on the design, construction, operation and survey of DCVs. The NSCV sets out standards relating to the construction, equipment, operation and crew standards for DCVs. Updates to the standards are informed by a technical advisory panel. AMSA can make Marine Orders (a type of regulation) in relation to any matter necessary to implement the MSNL. AMSA undertakes consultation for new or amended Marine Orders.

These instruments give AMSA the ability to adapt the technical and operational requirements that apply to DCVs. The effectiveness of the technical standards in ensuring that vessels meet safety standards is diluted by grandfathering arrangements. An example is the requirements around smoke detectors. Under the NSCV, accommodation spaces on DCVs are required to be fitted with fire detection or smoke detection systems, depending on their size, number of passengers and operations. However, the MUA pointed to certain vessels that are subject to grandfathering:

... don't require smoke detectors in accommodation spaces on passenger vessels where passengers are staying overnight, and AMSA can't make them do it. So they've said, 'Well, you need to assess the risk', and the operators are apparently saying, 'Well, we've assessed the risk and we don't like smoke detectors', and AMSA has to walk away and do nothing about it. (MUA, trans., p. 42).

The Commission is recommending that grandfathering provisions that apply to fire detection and/or smoke detection systems should be removed (recommendation 6.6). If State and

Territory governments do not agree to remove these provisions, AMSA could consider addressing this issue through a Marine Order (if justified by analysis of the safety risks and costs of the measure).

Capability

Financial capability

When State and Territory agencies provided services to DCV operators they did not recover the full costs of their regulatory activities from the regulated parties. Under Australian Government policy, AMSA is required to do so. The move to cost recovery marked a significant shift for the industry — full cost recovery would potentially lead to significantly higher costs for industry (and savings for other tax payers).

After the TIC agreed that AMSA would take responsibility for service delivery, the regulator commenced consultation with the industry on its funding model, including fees for certain services and a levy on all DCVs based on the size and class of the vessel. Industry pushed back against the full cost recovery model, particularly the levy component.

The debate over cost recovery and AMSA's fee structure absorbed significant resources and was an impediment to AMSA focusing on other aspects of the transition. For example, in its Strategic Workforce Plan for 2018–2021, AMSA stated that the absence of an agreed funding model prevented it from planning its workforce needs.

This Plan will propose more detailed resource planning, as it was not possible to carry out in the absence of a clear funding model to deliver the National System. Now that a funding model has been determined, more rigorous resource planning exercises will be undertaken in the lead up, and at regular intervals after 1 July 2018. (AMSA 2018a, p. 15)

The consultations over the funding model might also have caused industry stakeholders to be more negative to AMSA overall. In its 2015-16 Regulator Performance Framework Self-Assessment Report, AMSA suggested that the debate over cost recovery was being reflected in negative comments from operators on other matters.

... management believes that the transition currently underway which sees AMSA assuming full responsibility for service delivery of the National System for domestic commercial safety by July 2017 may have influenced some validation responses. Of particular note, the public consultation process for cost recovery under the National System started while the self-assessment validation was underway. (AMSA 2016, p. 8)

From 1 July 2018, AMSA commenced delivering services and charging fees. However, on 2 July 2018, the Australian Government announced that it would provide an additional \$10 million for the national system to cover the cost that would have been funded by the proposed levies. The Deputy Prime Minister explained the purpose of the funding.

This additional funding will mean no levy will be charged to industry for the first three years of AMSA's service delivery to assist all operators as services transition. (DIRDC 2018)

The full cost recovery model is scheduled to take effect from 1 July 2021. Developing a funding model that delivers adequate revenue for AMSA and is consistent with Australian Government cost recovery requirements is essential for AMSA to have a sustainable financial capacity.

Staff

In 2018, before AMSA became responsible for the MSNL, the agency had a headcount of 385. AMSA has advised the Commission that its full-time equivalent headcount as of December 2019 was 445. The regulator ‘must operate within the Average Staffing Level (ASL) cap of 452’ (AMSA 2018a, p. 15). As well as its own employees, AMSA has agreements with State government agencies to conduct joint audits of registered training organisations and memorandums of understanding with State and Territory workplace health and safety regulators and police forces. It also delegates responsibilities to non-AMSA staff.

Some inquiry participants commented that operators have less direct contact with AMSA representatives than they had with State and Territory agencies before transfer to the national system. According to AMSA’s evidence on the demand for face-to-face services, these concerns might be overstated.

We’ve had one walk-in to our Melbourne office, and, clearly, they’re used to doing stuff online. Queensland probably by far the more walk-ins there. A few in Tassie, but not hundreds of people milling around at counters. And so what we’re doing is trying to improve our online offerings and making our online forms and things better. (trans., p. 241)

AMSA has acknowledged that increasing the opportunities for face-to-face service delivery will be beneficial for industry. The chairman of AMSA stated in his message in the 2018-19 annual report:

We will make it easier for our stakeholders to be part of shaping safety standards and education by offering more face-to-face opportunities in regional locations — 75 staff are currently located outside the capital cities — and asking for feedback as we develop new systems and processes — including working with the community to modernise the national standard for commercial vessels. (AMSA 2019, p. 5)

To be an effective national regulator, AMSA will need to continue to monitor the need for staff to deliver services directly to vessel operators and direct resources (including staff) to areas where risks are greater.

Information

When it took on responsibility for the MSNL, AMSA also became responsible for maintaining a national database. Before 2018, State and Territory agencies had collected information on DCVs. AMSA is in the early stages of populating the national database and has faced challenges arising from differences in data collection methodology.

A key issue for AMSA in developing and maintaining a national database is that there was previously no consistent methodology for capturing records or data for domestic commercial vessels. Prior to AMSA taking on service delivery, some jurisdictions ran decentralised paperbased record management systems, while other jurisdictions maintained electronic files. It has also become apparent that not all required records may have been captured accurately, comprehensively or at all, regardless of the methodology used.

This has practical implications for AMSA and industry, as it is not always clear what certificate or approval a vessel may have, if any, nor the history the vessel and operator have with the state and territory regulatory bodies. As a result, AMSA regulates domestic commercial vessels based on mostly inherited data that contains errors, and is incomplete. Correcting these issues is time consuming and resource intensive and remains an ongoing challenge for AMSA. (AMSA, sub. 35, p. 8)

Industry agreed with the regulator that the data collection task is complicated.

AMSA has the un-enviable task of doing the best they can with limited vessel history available from some states and a system that was not applied consistently across Australia. (Maritime Survey Australia 2019, p. 1)

The transition of the DCV sector from state/territory regulation to the National System is clearly a challenging task, made more difficult by the variation in the quality, format and extent of historical data collected by the state/territory, needing to be acquired by AMSA. The data processing aspect of the transition of data has been hugely resource intensive as we understand it. There are also major inefficiencies in information handling affecting industry because the states and territories still hold some historical records that, due to the removal of jurisdictional authority to provide information, require Freedom of Information requests to obtain. (MIAL, sub. 14, p. 5)

AMSA advised that the process of obtaining all the data it requires will take several years.

... how far down the path are we to saying the job is done? Nowhere near as far as we would want to be, and I guess we quite openly accept we will probably have to get through a full survey cycle of five years before we've got a high level of confidence. (AMSA, trans., p. 243)

The Commission has worked with AMSA to obtain data for this inquiry and has observed that the regulator has improved its data capabilities. Gaps in the data are an impediment to effective risk-based regulation and will persist for some time. The Commission has recommended measures to empower AMSA to collect information, particularly the phase-out of grandfathering arrangements that relate to vessel survey (chapter 6).

Governance

The *Australian Maritime Safety Authority Act 1990* (Cwlth) specifies that the board of AMSA is to consist of nine members, who are appointed by the Minister for Infrastructure and Transport. The Minister is required to use his or her 'best endeavours' to ensure that at least one board member 'is a person who the Minister is satisfied has knowledge of, or experience relevant to, the construction or operation of domestic commercial vessels'

(s. 13(4A)). These arrangements are consistent with good practice (although nine board members is at the upper limit for effective governance).

Regulator behaviour

Flexible approaches to regulation

AMSA stated that it takes:

... a risk based and proportionate approach in determining where to focus legislative and compliance responses so that those who demonstrate a safety culture, and are compliant, are rewarded by reduced regulatory intervention. (AMSA 2018c)

In its submission to the inquiry AMSA acknowledged that it does not have access to all the data required to properly identify higher-risk categories of vessels and operators.

Where operators have compliant vessels, a good safety record and a safety management system, AMSA focuses on periodically verifying that they are complying with the safety outcomes required by the law through risk-based surveillance and systems-based audits. However as noted above, the accuracy and completeness of data remains an ongoing challenge for AMSA. (AMSA, sub. 35, p. 13)

Participants in this inquiry commented on the regulator's application of flexible approaches. The MUA stated that Marine Orders that apply under the *Navigation Act* are prescriptive, whereas Marine Orders under the MSNL are risk-based. The union argued that the risk-based approach imposes a lower standard on vessel operators. The Commission does not agree. Flexible approaches to regulation can achieve equal or better safety outcomes than prescription. The regulator's role is to assess safety risks and choose the appropriate tools to address them, which will not always mean taking a prescriptive approach.

AMSA takes a flexible, risk-based approach to aspects of its work and is developing its capabilities to expand its use of flexible instruments.

Service delivery and stakeholder engagement

Participants in this inquiry and in the Senate inquiry into the performance of AMSA criticised aspects of the regulator's service delivery and engagement. Some of the criticisms relate to AMSA's service delivery model, which makes greater use of online and call centre service delivery than had been the case under the State and Territory systems. Other criticisms relate to the capabilities of AMSA's staff in the period after AMSA took on responsibility for service delivery in July 2018.

Some inquiry participants had a more favourable opinion. The DITCRD stated that AMSA's transition to full responsibility for service delivery was 'successful and well managed'.

Upon transition, AMSA was able to manage services immediately with few issues or complaints, and adapted to overcome challenges such as handling a high volume of applications in progress

(including a backlog transferred to AMSA from some jurisdictions at the time of transition), and amalgamating data from seven systems. ... From 1 July 2018 to 30 June 2019, AMSA managed over 188,000 calls and 3300 walk-in customers, supported over 340,000 website visits, and over 20,000 applications for vessel and seafarer certificates. (DITCRD, sub. DR74, pp. 1–2)

AMSA presented several positive quotes from industry stakeholders and case studies of engagement with DCV operators in its post-draft report submission (sub. DR71). The regulator also identified some challenges it faced in developing an effective approach to service delivery. In particular, it stated that several jurisdictions reduced their regulatory effort in the lead up to handing over service delivery to AMSA, leaving the national regulator with a backlog of work.

... some of the jurisdictions actually gave it a name. They call it dimming the lights in our case, and, despite our pointing out of the obligations, “Well, hang on. We all signed this IGA, and it was agreed that this was going to happen”, but it just didn’t happen. (AMSA, trans., p. 245)

Further to this, the Commission understands that the decision to delay the handover of service delivery from 2017 to 2018 caused challenges for AMSA’s workforce development. Many talented staff of State and Territory agencies did not stay on once the transition period was extended.

Evidence of AMSA’s service delivery

The criticisms of AMSA’s service delivery and engagement with regulated parties were mainly anecdotal. Undoubtedly, some operators have had negative experiences with AMSA. However, the limited empirical evidence shows that, overall, AMSA’s stakeholders are reasonably satisfied with service delivery (table 5.1).

Table 5.1 Stakeholder satisfaction with AMSA service delivery

Year		2015-16	2016-17	2017-18	2018-19
Call centre satisfaction	%	90.5	90	90.5	85
Stakeholder satisfaction with AMSA ^a	1–6 scale ^b	np	3.73	3.38	4.1

^a Score is an average of responses to six questions: (1) AMSA helps vessel owners and seafarers safely operate or work on a vessel without getting in the way; (2) communications I get from AMSA are clear and useful; (3) given the risks involved in what I do, the level of regulation is about right; (4) AMSA’s compliance and monitoring arrangements are well organised and efficient; (5) AMSA explains its decisions well; (6) AMSA is always trying to improve maritime regulations to create a safer and more efficient industry.

^b 1 = strongly disagree, 2 = disagree, 3 = somewhat disagree, 4 = somewhat agree, 5 = agree, 6 = strongly agree. np not published.

Source: AMSA (2019).

AMSA has room for improvement

AMSA has acknowledged that it has room for improvement in service delivery and stakeholder engagement.

As we only assumed service delivery, though, on 1 July '18, we are still refining the system. It's still a work-in-progress, but we still welcome the opportunity this review has given us to reflect on the implementation of the reform and look at how it can potentially be made better. (AMSA, trans., pp. 228–229)

The regulator provided some evidence that its service delivery is improving.

And with customer service officers ... about 12 months ago, I think, when they would get a phone call probably about a third of them they would have to escalate up to someone because they couldn't help. Well, we're down to about — I think it's about seven or eight per cent now, so that has improved. (AMSA, trans., p. 242)

Strategic use of powers

At this stage of the implementation of nationally consistent DCV regulation and service delivery there is not enough evidence to make a firm judgment about AMSA's use of its powers. However, there is evidence that AMSA has used its power to amend the NSCV to address some safety risks.

Winding up certain grandfathering provisions

AMSA has amended the NSCV to remove grandfathering in areas including safety equipment, float-free Emergency Position Indicating Radio Beacons, operational requirements and survey frequency (AMSA, sub. 71, p. 9). In these cases, action was taken to remove grandfathering because AMSA considered the arrangements to not 'make sense' or 'meet public expectations' (AMSA, trans., p. 238). AMSA opted for a staged transition to new standards, with staggered progress within each grandfathered area. The bulk of transition is now complete, but in the case of safety equipment, the transition process to modern standards is ongoing for some equipment types (AMSA, sub. DR71, p. 9).

Summing up

AMSA is less advanced than the NHVR and ONRSR in its development as a national regulator, having only taken responsibility for service delivery in 2018, but is making good progress. The Australian, State and Territory governments greatly expanded AMSA's responsibilities when they made it responsible for service delivery under the MSNL. Some State and Territory agencies 'dimmed the lights' on their service delivery responsibilities and appear to have given little support to AMSA. This left AMSA with a backlog of work and an incomplete and poor-quality database. In addition, the carve-outs created by the

grandfathering arrangements and the inconsistent data on DCVs have been major barriers to effective regulation.

Over the course of this inquiry the Commission has observed that AMSA is improving its information base. The regulator still has work to do to improve aspects of its service delivery model, including expanding its operations in some parts of Australia. AMSA also needs to achieve a sustainable funding model, based on cost recovery for regulatory services.

FINDING 5.3 – AMSA IS RESPONSIBLE FOR A BROAD RANGE OF VESSELS

The Australian Maritime Safety Authority (AMSA) has a complex regulatory task. AMSA is responsible for regulating a diverse set of vessels, from kayaks to fishing boats and passenger ferries. Operators of domestic commercial vessels are also diverse. Some large operators are able to implement sophisticated risk management systems, while many smaller operators have difficulty in using AMSA's centralised, online systems. The diversity of the fleet and operators has complicated the process of transition to consistent national regulation of domestic commercial vessels.

6 Has harmonisation of transport regulation improved safety?

Key points

- Safety risks and outcomes differ across the three modes of transport.
 - Heavy vehicles share the road with other users and are involved in a significant number of crashes causing death or serious injury. Most fatalities that are associated with heavy vehicles are not the fault of the heavy vehicle driver.
 - Rail transport has far fewer serious injuries and fatalities from accidents, but a significant number of fatalities due to intentional self-harm.
 - Domestic commercial vessels have been associated with between eight and 16 fatalities per year since 2013, although there appears to be a relatively high rate of serious injury in the fishing sector. The evidence on maritime safety is poor, with a high likelihood of underreporting.
- To date, the national transport reforms do not appear to have had a significant impact on safety.
 - Across the three sectors the long-term trend has been for the rate of incidents to decrease over time. There has been no significant change in the trends after the national reforms.
- Reforms to safety regulation could lead to improvements in safety in the future.
 - In the heavy vehicle sector, progress has been achieved in areas such as chain of responsibility and fatigue management (which would, however, benefit from additional flexibility).
 - State and Territory governments should seek to improve general road users' understanding of driving safely near heavy vehicles through education and enforcement measures.
 - The co-regulatory model appears to work well in rail, although more progress is needed in addressing derogations in fatigue management and in safety at level crossings.
 - In the maritime sector, unwinding grandfathering provisions relating to vessel survey would improve the regulator's ability to identify higher-risk vessels and operators. In addition, removing grandfathering provisions around smoke detectors on passenger vessels would improve safety.

6.1 Introduction

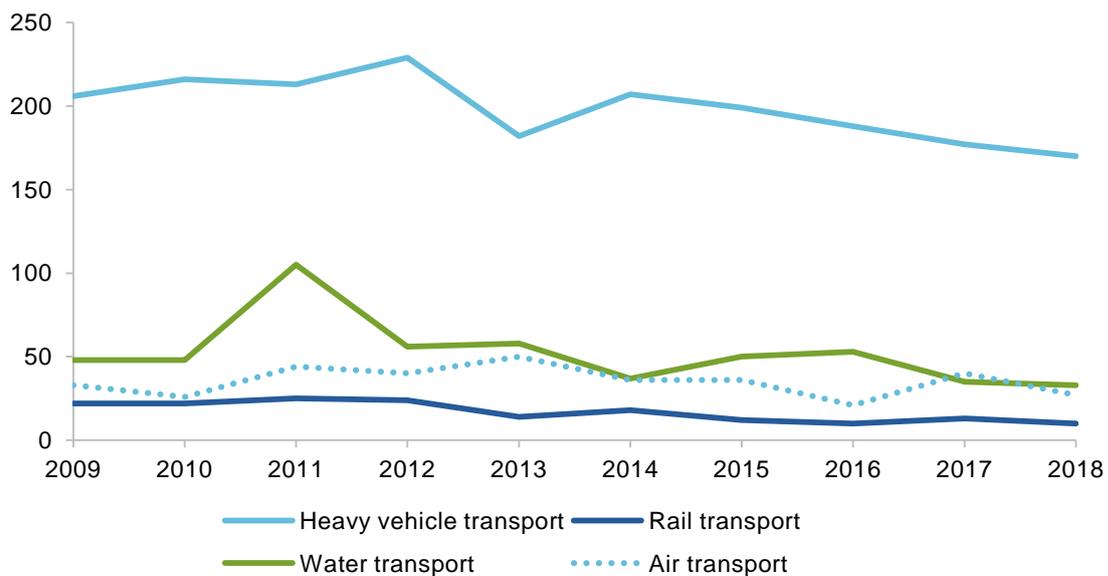
Transport safety regulation can influence safety outcomes, but the effects of changes to regulation are difficult to isolate among other influences, such as the state of transport infrastructure, freight volumes, technology changes, industry practices, and the behaviour of transport operators and third parties. The staggered roll-out of the national laws and the existence of derogations in critical safety areas rules out a simple ‘before/after’ analysis of the Council of Australian Governments (COAG) reforms.

This chapter presents evidence on safety in the heavy vehicle (section 5.2), rail (section 5.3) and domestic commercial vessel sectors (section 5.4). This includes both empirical evidence and a qualitative assessment of the changes to safety regulation.

The number of fatalities — an important measure of transport safety outcomes — has fallen over the past decade in the heavy vehicle and rail sectors (figure 6.1). The number of fatalities in the maritime sector has not changed significantly, although recorded fatalities have remained relatively low, compared to heavy vehicles.

In all three sectors, the evidence does not support a conclusion that the shift to national regulation has produced a step change in the number of fatalities. Over time the reforms could contribute to improved transport safety risk management and better safety outcomes.

Figure 6.1 **Number of fatalities by mode of transport^a**
2009–2018



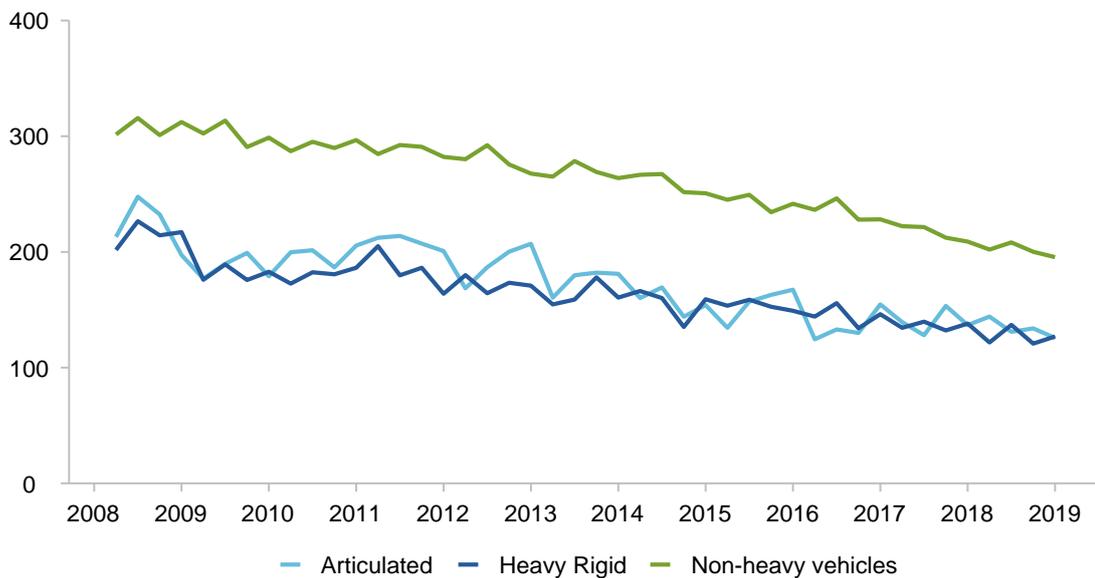
^a Includes all maritime transport deaths, and does not distinguish those involving domestic commercial vessels. As such, this likely overestimates the fatal incidents relevant to the Marine Safety National Law.

Sources: ABS (*Causes of Death, Australia, 2018*, Cat. no. 3303.0).

6.2 Heavy vehicle transport safety

Heavy vehicle safety has improved significantly over the past decade. The rate of heavy vehicle crashes involving injury or death (per billion vehicle kilometres travelled) fell by about 40 per cent between 2009 and 2019 (figure 6.2). The decline in crash rates for heavy vehicles has been similar to the decline for non-heavy vehicles. Similar trends in crash rates suggest that the decline is related to factors that affect all vehicle types. This might include road infrastructure and maintenance, driver education and training, enforcement of road rules, and improvements in vehicle design, reliability and safety features.

Figure 6.2 **Heavy vehicle crash rates have fallen per distance travelled^a**
Crashes involving injury or death per billion vehicle kilometres travelled (VKT)



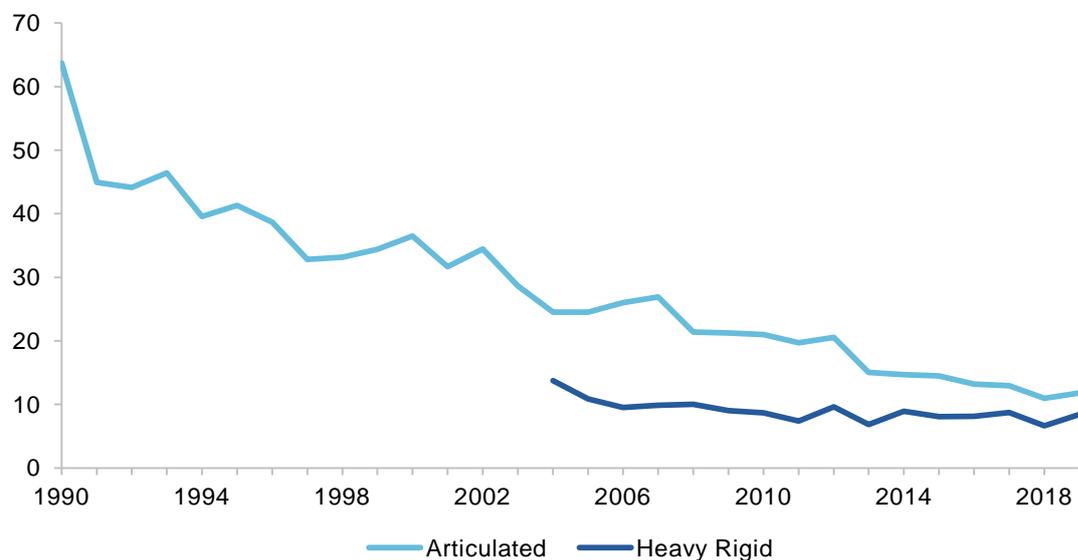
^a 'Heavy rigid' refers to vehicles greater than 4.5 tonnes Gross Vehicle Mass constructed with a load carrying area or fitted with special purpose equipment. 'Articulated' refers to vehicles constructed primarily for load carrying, consisting of a prime mover that has no significant load carrying area but with a turntable device that can be linked to one or more trailers. Non-heavy vehicles are all other road vehicles.

Source: Commission estimates based on the National Crash Database and VKT estimates (BITRE unpublished).

The rate of heavy vehicle-related fatalities has fallen over at least the past 25 years (figure 6.3). Articulated vehicles have had higher rates of involvement in fatal crashes than smaller (rigid) trucks or road vehicles.

Figure 6.3 Truck-related fatalities have fallen per distance travelled^a

Number of fatalities per billion vehicle km travelled (VKT)



^a Fatality rates calculated from calendar year estimates for fatalities and financial year estimates for kilometres travelled.

Sources: Commission estimates based on BITRE (2016b, 2017, 2020); BITRE VKT estimates (unpublished).

FINDING 6.1 – ROAD SAFETY HAS IMPROVED FOR MOST VEHICLE TYPES

Heavy vehicle safety has improved significantly over the past decade. The number of heavy vehicle crashes involving injury or death per kilometre travelled fell by about 40 per cent between 2009 and 2019. The fall in crash rates is likely to be due to factors affecting all vehicle types (for example, improvements in road infrastructure and new safety technologies).

Are the changes in safety outcomes related to the HVNL?

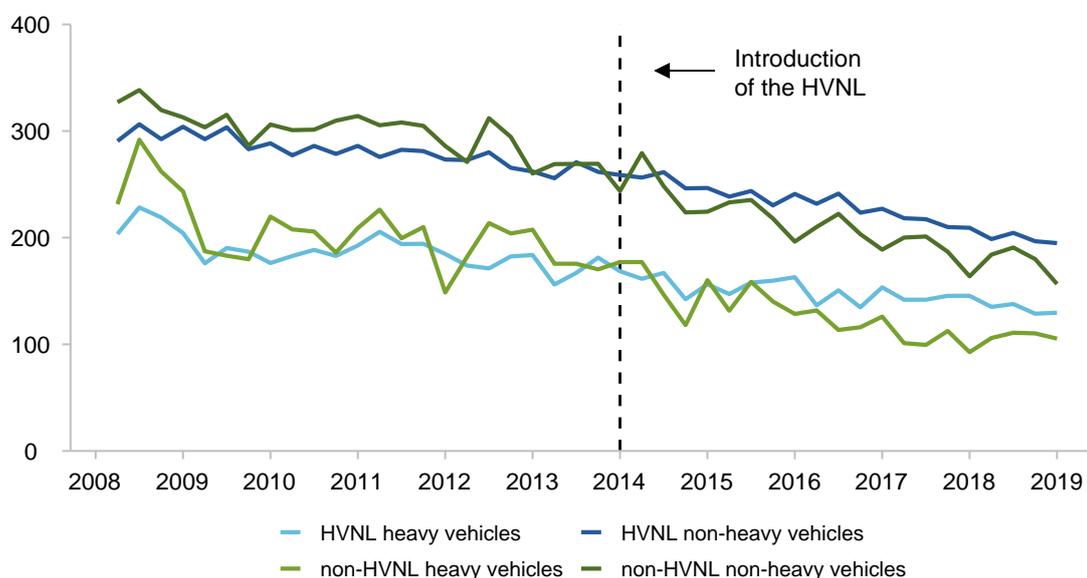
To examine the impact of the reforms on heavy vehicle safety the Commission compared:

- Heavy Vehicle National Law (HVNL) and non-HVNL jurisdictions (figure 6.4)
- heavy and non-heavy vehicles in HVNL states.

In both instances, there is insufficient evidence to conclude that adopting the HVNL had a significant effect on heavy vehicle safety outcomes. The details of the analysis are set out in appendix B.

Figure 6.4 The HVNL does not appear to have significantly affected heavy vehicle safety outcomes^{a,b}

Crashes involving injury or death per billion vehicle kilometres travelled (VKT)



^a Non-heavy vehicles include all vehicles excluding articulated and heavy rigid trucks. The Commission is aware that a quality assurance process is underway for WA crash statistics before 2012. ^b The HVNL commenced on 10 February 2014 in NSW, Vic, ACT, Qld, SA and Tas.

Sources: Commission estimates based on the National Crash Database and BITRE VKT estimates (unpublished).

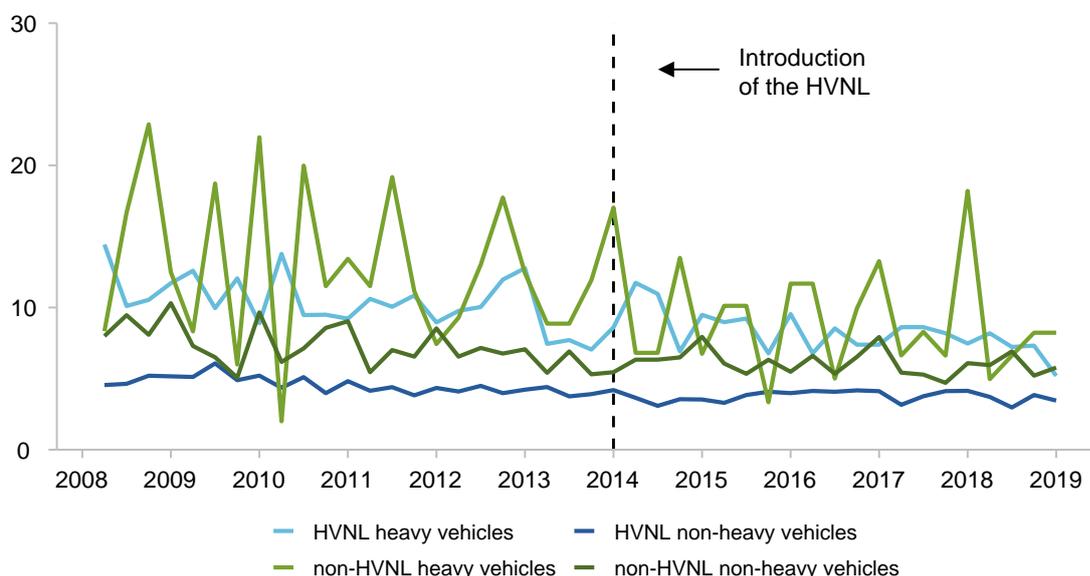
The Commission also examined:

- crashes by heavy vehicle types — for example articulated and heavy rigid trucks
- crashes involving fatality (figure 6.5).

Again, the evidence does not show that the COAG reforms had any significant effect (positive or negative) on heavy vehicle safety outcomes (appendix B).

Figure 6.5 **No significant impact on fatal heavy vehicle crashes^{a,b}**

Crashes involving death per billion vehicle kilometres travelled (VKT)



^a Non-heavy vehicles include all vehicles excluding articulated and heavy rigid trucks. ^b The HVNL commenced on 10 February 2014 in NSW, Vic, ACT, Qld, SA and Tas.

Sources: Commission estimates based on the National Crash Database and BITRE VKT estimates (unpublished).

Other road users are often at fault

The Bureau of Infrastructure, Transport, and Regional Economies (BITRE) reported that about 60 per cent of people killed in heavy vehicle crashes in 2016 were light vehicle occupants and 20 per cent were ‘vulnerable road users’ (for example, cyclists, motorcyclists or pedestrians) (BITRE 2016a, p. 1).

Most fatal incidents that involve heavy vehicles are not legally the fault of the heavy vehicle operator. BITRE reported that ‘available Australian evidence suggests that in approximately 80 per cent of fatal multiple-vehicle crashes involving heavy trucks, fault is not assigned to the heavy truck’ (BITRE 2016a, p. 1).

More recent data from National Transport Insurance (NTI 2019, p. 23) (covering heavy vehicle insurance claims greater than \$50 000) suggests that among multi-vehicle incidents in 2017 which did not involve a fatality, the heavy vehicle driver was at fault 65 per cent of the time. For fatal multi-vehicle crashes, the other driver was at fault 83 per cent of the time.

In the draft report the Commission recommended that governments take steps to improve road users’ behaviours around heavy vehicles as a strategy to reduce the number of injuries and fatalities. Several inquiry participants agreed with the draft recommendation (National

Farmers' Federation, sub. DR48; Red Meat Advisory Council sub. DR52; Victorian Farmers' Federation, sub. DR 53).

FINDING 6.2 – RESPONSIBILITY FOR HEAVY VEHICLE FATALITIES

In 2017, most multi-vehicle fatal crashes involving a heavy vehicle were not the fault of the heavy vehicle driver. The driver of the other vehicle was at fault 83 per cent of the time. For serious, non-fatal, multi-vehicle crashes involving a heavy vehicle, the heavy vehicle driver was at fault 65 per cent of the time.

RECOMMENDATION 6.1 – EDUCATION AND ENFORCEMENT TO IMPROVE ROAD SAFETY

State and Territory governments should introduce new programs or continue with existing programs of education and enforcement to improve road users' understanding of driving safely around heavy vehicles.

Developments in heavy vehicle safety policy

This section sets out the Commission's assessment of the safety effects of Chain of Responsibility (CoR) laws, heavy vehicle accreditation schemes and fatigue management regulation.

Chain of responsibility

Under CoR laws, parties in the supply chain other than the driver (for example, transport operators and clients) have a general duty to ensure that breaches of transport laws do not occur. These parties can be held accountable for breaches or safety incidents where they have influenced non-compliance.

CoR was a component of the original HVNL framework. Before an amendment to the law in 2018, CoR laws were prescriptive, imposing different duties on different parties that sometimes did not include the most responsible party (NTC 2015, pp. 4–5). Under the new law, CoR is based on a non-transferable duty of care, which requires all parties in the supply chain to do whatever is 'reasonably practicable' to ensure safe and compliant driving.

Assessment of Chain of Responsibility

CoR laws could contribute to better safety outcomes, but there is little evidence of the effects of including the laws in the HVNL (Freight and Logistics Council of WA, sub. 22, p. 4; Roads Australia, sub. 11, p. 3). Inquiry participants generally agreed with the idea that

parties across the supply chain have some responsibility for heavy vehicle safety. For example, the Victorian Farmers' Federation stated:

... when we break it down to making sure that the drivers are in a safe place and that you're providing safe equipment to operate in, if that's the pure intent of the legislation, I think that we're very comfortable with those elements. (trans. p. 294)

Some inquiry participants stated that the application of a general duty of care leads to uncertainty about their specific responsibilities and what measures are 'reasonably practicable' (Australian Trucking Association, trans. p. 136.; NatRoad, sub. DR55; Victorian Farmers' Federation, trans. p. 194) The National Farmers' Federation identified the challenge for many of its members.

Many farmers and industry associations sought clear guidance from NHVR on what they needed to do to comply with the changes. The response was that users should take a 'common sense' approach to interpreting the requirements. The implication of this advice was it would only be through post-regulatory prosecution that farmers (and other users) would have a clear idea as to what action (or lack of action) constituted a breach. (sub. 36, p. 3)

In some cases, a lack of certainty about CoR obligations, combined with risk aversion, has led supply chain participants to impose stringent requirements on transport operators. NatRoad stated that some customers have imposed excessive compliance burdens, including 'frequent and intrusive audits' and 'sometimes unreasonable operational directives' (sub. DR55, p. 8). The Australian Trucking Association noted that there is no agreed standard for CoR audits, and that this leads to inconsistencies and duplication:

For small businesses in particular what they are experiencing now is customers who have adopted computer-based systems for managing their contracts, and those computer-based platforms have in them audit requirements as well. And of course inevitably my computer-based system bears no resemblance and has no common interface with somebody else's computer-based system, and everyone insists that their computer-based system is the only way to go forward. (trans., p. 136)

NatRoad also identified a more pernicious use of CoR laws. It stated that its members 'have alerted us to concerns about customers up the supply chain using CoR as a means of getting information and applying excessive audit requirements' (sub. DR55, p. 8). The Commission has not been able to verify these claims, but it is concerned that transport customers could use CoR laws to increase and exercise their market power.

The National Transport Commission is aware of these issues. In an issues paper for its current review of the HVNL, it stated 'CoR parties should be clear on their obligations under the future HVNL' (NTC 2019b, p. 44). The Commission agrees that this principle should form part of the CoR laws in the future. To put the principle into practice, the National Heavy Vehicle Regulator (NHVR) should be empowered to establish 'acceptable means of compliance' with CoR laws, and should have a role in accrediting other approaches to compliance. Requirements that are imposed by customers under the guise of CoR laws, but are not necessary to satisfy safety duties, should not be accredited.

FINDING 6.3 – UNCERTAINTY ABOUT CHAIN OF RESPONSIBILITY OBLIGATIONS

Many heavy vehicle operators, customers and other supply chain participants are uncertain about their obligations under Chain of Responsibility laws. Some contracting parties are imposing unnecessary and costly requirements on transport operators to minimise their potential liability. These additional requirements may also provide opportunities for large transport purchasers to exercise market power in ways that could reduce competition in the market for transport services.

RECOMMENDATION 6.2 – CLARIFYING HEAVY VEHICLE CHAIN OF RESPONSIBILITY OBLIGATIONS

The Council of Australian Governments should endorse amendments to the Heavy Vehicle National Law to clarify the obligations of regulated parties under Chain of Responsibility laws. The amendments to the Heavy Vehicle National Law should empower the National Heavy Vehicle Regulator to:

- publish ‘acceptable means of compliance’ with Chain of Responsibility laws for transport operators and other parties in the supply chain
- accredit other approaches to compliance, with the costs of accreditation to be borne by the regulated parties.

Heavy vehicle operator accreditation

Three accreditation schemes operate for heavy vehicle operators (box 6.1).

- TruckSafe was introduced in 1996 and is administered by the Australian Trucking Association.
- The National Heavy Vehicle Accreditation Scheme (NHVAS) was established in 1999. State and Territory road transport authorities handed administration of the NHVAS to the NHVR in 2014.
- The Western Australia Heavy Vehicle Accreditation scheme (WAHVA) was introduced in 2002 and is administered by Main Roads Western Australia.

About 20 per cent of heavy vehicle operators are accredited (Fellows Medlock and Associates 2018, p. 20). Operators participate in the accreditation schemes for different reasons. Accreditation under the TruckSafe scheme can provide commercial benefits and is required by some customers as proof of compliance with CoR laws. The main attraction of NHVAS accreditation is access to regulatory concessions (Fellows Medlock and Associates 2018, p. 35).

Box 6.1 Accreditation under the NHVAS, TruckSafe, and WAHVA**National Heavy Vehicle Accreditation Scheme**

The National Heavy Vehicle Accreditation Scheme (NHVAS) is administered by the National Heavy Vehicle Regulator. Accreditation is available nationally and is optional. Heavy vehicle operators can apply for accreditation under any of the four NHVAS modules, and are granted regulatory concession.

The modules are: Mass Management (allowing operation at concessional mass limits greater than general limits); Maintenance Management (allowing concession from annual inspections, subject to State Government decision); Basic Fatigue Management (allowing more flexible work and rest hours); and Advanced Fatigue Management (allowing greater flexibility in hours). The concessions granted to accredited operators are not available to participants in other schemes.

TruckSafe

TruckSafe is an industry-based scheme, developed and managed by the Australian Trucking Association. Accreditation is available nationally and is based on a set of minimum standards with seven compulsory core modules: Management; Risk Management; Responsibilities; Speed Risk Management; Fatigue Risk Management; Mass, Dimension, Loading and Restraint; and Vehicle Standards (including maintenance). There is also one voluntary module (Animal Welfare). TruckSafe purports to assure accredited members that they have met Chain of Responsibility requirements. Accreditation does not provide any regulatory concessions.

Western Australia Heavy Vehicle Accreditation Scheme

Accreditation under the Western Australia Heavy Vehicle Accreditation scheme is compulsory for any operators wishing to use Restricted Access Vehicles in WA. The scheme involves three mandatory modules which operators are required to incorporate into their daily work practices: Fatigue (based on WA Occupational Safety and Health Regulations); Maintenance; and Dimension and Loading. Mass Management is an optional module which is only required if an operator wishes to operate within the Accredited Mass Management Scheme which provides three concessional mass levels for operators that have proven loading controls.

Sources: Main Roads WA (2019); NHVR (2019); TruckSafe (2019).

Safety effects of heavy vehicle accreditation

The effects of heavy vehicle accreditation schemes on efficiency and productivity are not known with certainty, but are likely to be positive because accreditation provides for increased flexibility in operations. Research into the relationship between accreditation and safety provides some evidence that accredited operators have better safety outcomes than other operators (box 6.2).

Box 6.2 Assessments of accreditation schemes and safety

Austrroads undertook a comprehensive review of heavy vehicle accreditation and safety in 2008. This review examined the safety impacts of the National Heavy Vehicle Accreditation Scheme (NHVAS) and TruckSafe using accreditation, crash and insurance data. It found that crash rates for vehicles accredited to TruckSafe or NHVAS were considerably lower than for non-accredited vehicles. The review also found that the rate of insurance claims made by National Transport Insurance insured operators accredited by TruckSafe was 33 per cent lower on average over a 5 year period, than the rate of claims of non-accredited operators (4.1 per cent compared with 6.1 per cent). This could indicate that the operators that become accredited already had lower risk profiles (perhaps due to experience and skill). Alternatively, it could indicate that the process of becoming accredited increases operator capability and reduces risk.

Austrroads found some evidence that the process of becoming accredited leads to improved safety performance. Among a sample of 13 operators (of which most had fewer than 10 vehicles) the total cost of heavy vehicle insurance claims in the two years following accreditation was about 50 per cent lower than in the two years preceding accreditation.

A number of studies since the 2008 Austrroads review have investigated the relationship between safety and accreditation. Overall they found mixed evidence.

- The Road and Traffic Authority (NSW) Review of Safety Accreditation Schemes (2010) concluded 'only limited evidence could be found that schemes delivered the results that were intended or that these schemes could be demonstrated to improve road safety'.
- The Transport for New South Wales Heavy Vehicle Compliance Survey (2015) found that accredited vehicles in 2012 were associated with a higher major defect rate than non-accredited vehicles. However, the reverse was true in 2015, with accredited vehicles showing a marginally lower major defect rate than non-accredited vehicles.
- The 2016 NHVR Roadworthiness survey found that major non-conformities occurred in 9 per cent of vehicles participating in either the NHVAS or TruckSafe, compared to 13 per cent for non-participating vehicles. The analysis found that accredited vehicles were on average significantly newer, suggesting that the lower non-conformity rate could be associated with age.
- The WA Heavy Vehicle Roadworthiness Survey (2017) conducted a survey of the WA heavy vehicle fleet and found that accredited vehicles had a substantially lower identified defect rate (10 per cent) than non-accredited operators (35 per cent).

Sources: Austrroads (2008); Fellows Medlock and Associates (2018) .

The evidence base for assessing the relationship between accreditation schemes and safety outcomes is outdated and incomplete. The most thorough study of the NHVAS and TruckSafe, carried out by Austrroads, used crash data from 2003–2005. The accreditation schemes, heavy vehicle safety regulation, technology and the road network have changed significantly since then, making the results of the study less relevant. More recent studies have focused on indicators of risk, including vehicle defects, rather than crash rates.

Another examination of the relationship between heavy vehicle crash rates and accreditation schemes is overdue. The Commission has been unable to conduct this research itself because the datasets that it was able to access did not indicate whether a heavy vehicle was accredited. Such analysis would provide assurance that the regulatory concessions that are available under the NHVAS are not leading to worse safety outcomes.

FINDING 6.4 – THE EFFECTS OF HEAVY VEHICLE ACCREDITATION ON SAFETY ARE UNCLEAR

Heavy vehicle accreditation schemes create opportunities for operators to implement flexible approaches to some aspects of their business. However, evidence of the safety effects of heavy vehicle accreditation schemes is incomplete. Improving the range and type of data collected is important for effective risk-based regulation and enforcement.

Driver fatigue management

Fatigue is associated with roughly one in ten major heavy vehicle crashes (NTARC 2019, p. 17). Fatigue is the main cause of fatal single-vehicle crashes involving heavy vehicles, and is identified by drivers as a major risk (NTC 2019a, p. 16). All jurisdictions have fatigue management regulation in place for heavy vehicles, with different rules in Western Australia, the Northern Territory, and the HVNL jurisdictions (box 6.3). Fatigue regulation in the HVNL jurisdictions is not consistent — some states have used derogations to retain past fatigue management regulations in addition to the HVNL (chapter 4).

Assessment of fatigue management reforms

Under the HVNL, fatigue is managed primarily through the general safety duties (including those imposed by CoR laws) and limits on work and rest hours (NTC 2019a, p. 30). Some aspects of fatigue management regulation were established in the National Heavy Vehicle Driver Fatigue Reform in 2008, which was subsumed into the HVNL in 2013.

There is some evidence that fatigue-related safety outcomes have improved in recent years, although it is not possible to isolate the effect of the HVNL on fatigue-related safety outcomes. The NTI's National Truck Accident Research Centre (NTARC) reports that among major heavy vehicle insurance claims, 9.8 per cent involved fatigue in 2017, compared to 20 per cent in 2007 (NTARC 2019, p. 17). Data for New South Wales show volatility in fatigue outcomes since 2009, with the number of fatalities remaining stable (figure 6.6).

Box 6.3 **Fatigue management for heavy vehicles across Australia**

Heavy Vehicle National Law (HVNL) jurisdictions

The HVNL requires that:

- a person must not drive a fatigue-regulated heavy vehicle on a road while impaired by fatigue
- managing driver fatigue is a responsibility shared by all parties in the chain of responsibility
- parties must take all reasonable steps to make sure a person does not drive a fatigue-regulated heavy vehicle while impaired by fatigue. (NTC 2019a, p. 17)

Specific fatigue management provisions in the HVNL include:

- maximum work and minimum rest hours
- work diaries and record keeping
- fatigue management accreditation schemes. (NTC 2019a, p. 17)

Western Australia

Fatigue management in Western Australia is regulated under state-based Occupational Health and Safety legislation, regulations and a code of practice.

The fatigue management regulations and code of practice were developed in consultation with industry and tailored to suit the unique operating environment within WA. Commercial vehicle driver fatigue was recognised as an Occupational Safety and Health matter that was to be managed at every point in the supply chain and not limited to the driver of the heavy vehicle. Commercial vehicle driver requirements apply to both heavy vehicle and passenger hire and reward (omnibus) drivers, provided certain work time requirements are met. (WA Department of Transport, sub. 43, p. 4)

Northern Territory

In the Northern Territory, fatigue management is part of workplace health and safety (WHS) legislation.

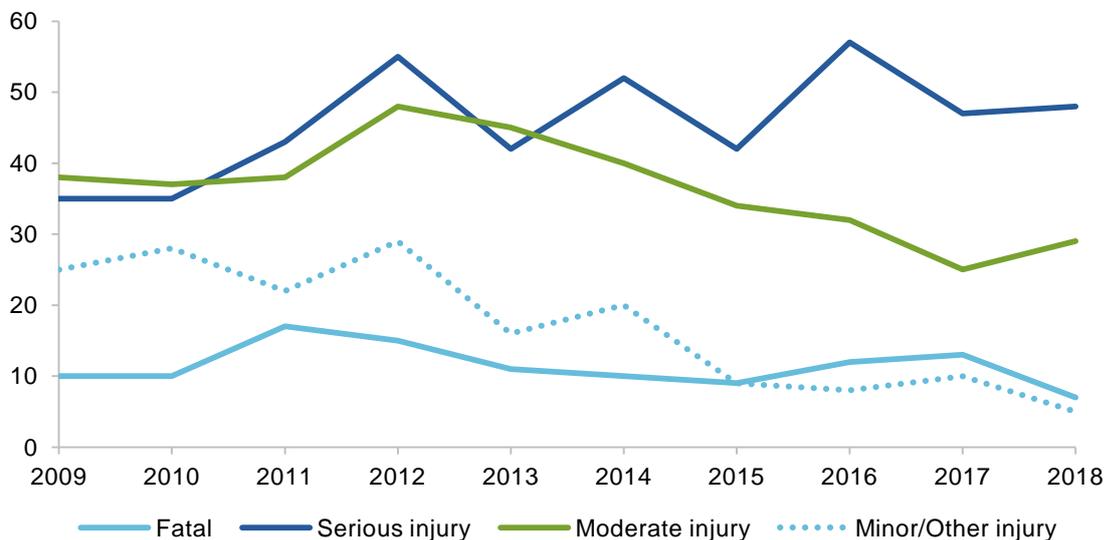
The Northern Territory uses a performance-based system that focuses on outcomes, not processes. The WHS Act sets out general principles, including duties of care. The WHS Regulations capture the level of performance that has to be achieved to meet the obligations in the WHS Act.

Codes of practice in the Northern Territory provide practical detail on at least one way of achieving the outcome or performance level in the legislation. The Road transport code of practice is not mandatory, but it gives operators key principles to apply to fatigue management in the workplace. These include that drivers must:

- be in a fit state to undertake the task
- be fit to complete the task
- undertake minimum periods of rest.

Importantly, drivers must monitor their own work performance and take regular rest breaks so they don't work when tired. The principles also include operator responsibilities such as providing suitable vehicles and giving drivers support to help them meet their obligations. (NTC 2019a, pp. 25–26)

Figure 6.6 Fatigue-related injury has fluctuated in New South Wales^{a,b}
 Number of heavy vehicle crashes involving fatigue, by injury type, 2009-18



a These data may include instances where a non-heavy vehicle driver was fatigued. **b** Serious injury means a person was identified in a police report and matched to a health record indicating a hospital stay due to injuries sustained in the crash, or is identified as an icare (Lifetime Care) participant. Moderate injury means a person was identified in a police report and matched to a health record that indicates that they were treated at an emergency department but were not admitted for a hospital stay, or was matched to a Compulsory Third Party (CTP) claim indicating a moderate or higher injury. Minor injury means a person was identified as sustaining an injury in a police report and was not matched to a health record that indicated the level of injury severity, or was matched to a minor injury CTP claim.

Source: NSW Centre for Road Safety Crash profile data (Transport for New South Wales 2019).

Toward better practice fatigue management

Inquiry participants identified negative effects of prescriptive fatigue management regulation. Anecdotal evidence from heavy vehicle operators suggests that prescriptive fatigue management can have unintended consequences and increase safety risks. For example, a scheduled rest stop might force drivers to travel at night on rural roads where there is an increased likelihood of collision with wildlife.

Operators also stated that enforcement of fatigue regulation can be heavy-handed and not related to effective risk management. NatRoad stated that drivers have been ‘fined for objectively petty requirements such not drawing a straight line in a record or failing to sign a page in the diary’ (sub. DR55, p. 10). Other participants noted that compliance with the paperwork requirements of fatigue management regulation (such as work diaries) does not ensure that a driver is not fatigued.

As part of its review of the HVNL the National Transport Commission (NTC) is reviewing fatigue management, with a view to providing policy options to ministers in late 2020 (2019a). In its issues paper, the NTC identified the limitations of the HVNL.

The HVNL doesn't have the flexibility to accommodate sophisticated fatigue management systems and practices, even though they may be more effective. Operators with these systems are still bound by the prescriptive controls in the HVNL. (NTC 2019a, p. 8)

The NTC review of the HVNL presents an opportunity to move towards more flexible and risk-based approaches to fatigue management. An effective, risk-based system of fatigue management would include:

- an obligation on all operators to ensure that they are not impaired by fatigue when driving
- 'outer envelope' restrictions on hours of work and rest that would apply to all operators (implemented through subsidiary instruments rather than included in legislation)
- 'acceptable means of compliance' for operators that want a simple, certain approach to compliance
- accreditation of fatigue management systems developed by operators that want to implement flexible approaches.

Heavy vehicle operators are increasingly using fatigue monitoring technology to detect physical signs of fatigue, with back-to-base monitoring and oversight. A risk-based approach to fatigue management would enable operators to use this type of technology to comply with regulatory requirements, if it can be demonstrated that it achieves acceptable safety outcomes. The potential movement toward more flexible regulation is discussed further in chapter 9.

RECOMMENDATION 6.3 – RISK-BASED FATIGUE MANAGEMENT IN HEAVY VEHICLE REGULATION

The Transport and Infrastructure Council should endorse amendments to the Heavy Vehicle National Law that promote a risk-based approach to fatigue management regulation for heavy vehicles.

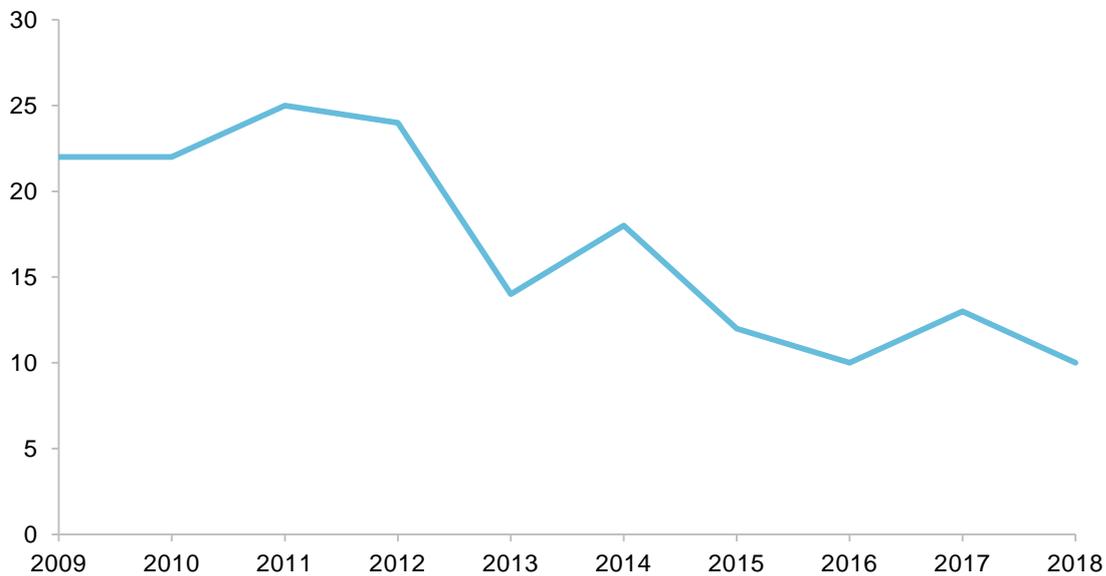
The amendments to the Heavy Vehicle National Law should remove detailed fatigue management requirements from legislation and empower the National Heavy Vehicle Regulator to:

- publish 'acceptable means of compliance' with fatigue management regulations
- set outer limits on driving hours
- provide concessions from prescribed aspects of fatigue management regulation, where the National Heavy Vehicle Regulator is satisfied that more effective systems of fatigue management are in place.

6.3 Rail transport safety

Compared with heavy vehicles, rail transport has relatively low rates of safety incidents, injuries and fatalities. The number of fatalities associated with rail transport (including passengers, rail workers and the general public) fell from 22 fatalities in 2009 to 10 in 2018 (figure 6.7). In the 2018-19 financial year, 93 fatalities associated with trespassing and suspected intentional self-harm were recorded (table 6.1). This category is by far the largest cause of rail-related fatalities, and poses a unique challenge for rail operators and regulators.

Figure 6.7 **Fatalities involving rail transport^a**
2009–2018



^a Excludes suspected suicides.

Source: ABS (*Causes of Death, Australia, 2018*, Cat. no. 3303.0).

Table 6.1 **Rail-related serious injuries and fatalities, 2018-19^a**

	<i>Fatalities</i>	<i>Serious Injuries</i>
Passenger	2	80
Public	5	8
Worker	0	8
Trespasser/suicide	93	33

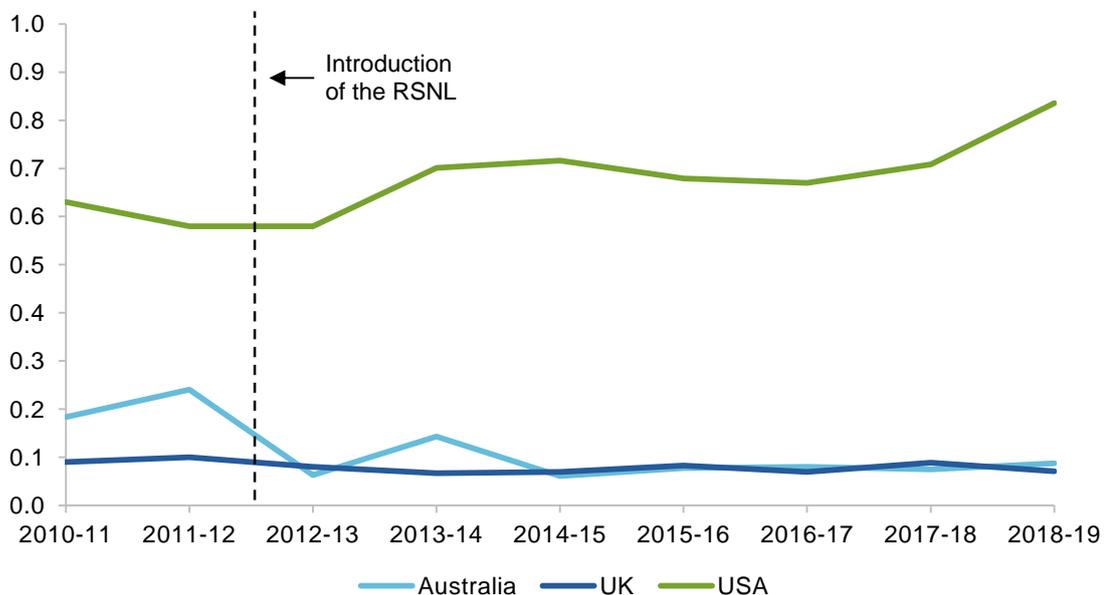
^aThese data have been national since the 1 July 2017, when Queensland transferred regulatory responsibility for rail safety to the Office of the Rail Safety Regulator (ONRSR).

Source: ONRSR (2020).

Are the changes in safety outcomes related to the RSNL?

Australia has significantly lower rates of rail-related fatalities per million kilometres travelled than the United States and similar rates to the United Kingdom (figure 6.8). The rate of fatalities in the States under the jurisdiction of the Office of the National Rail Safety Regulator (ONRSR) appears to be somewhat lower after the introduction of the Rail Safety National Law (RSNL). However, as with the heavy vehicle sector, it is not possible to attribute changes in safety outcomes to the introduction of the RSNL or the establishment of ONRSR.

Figure 6.8 Rail related fatalities have fallen^{a,b}
Fatalities per million train kilometres (km) travelled, July 2010 to June 2019



^a Excludes suspected suicides. ^b ONRSR commenced operations on 20 January 2013. NSW, SA, Tas, and NT data are for full period; ACT data are from 1 July 2013; Vic, WA and QLD data are from 1 July 2014 onwards. Data excludes local Vic operators regulated under state legislation for the whole reporting period. The comparison is most valid for the United Kingdom because of its comparatively high rail safety performance. Sources: ONRSR (2013, 2014, 2015, 2016, 2017, 2018b, 2019c); ONRSR (unpublished).

Developments in rail safety policy

This section sets out the Commission's assessment of the safety effects of drug and alcohol testing, fatigue management regulation and level crossing safety.

Industry drug and alcohol testing

The RSNL identifies a rail safety worker as any individual who has carried out, is carrying out, or is about to carry out rail safety work, which includes tasks such as driving, maintaining or modifying rolling stock or rail infrastructure. Under the RSNL, it is an offence for a rail safety worker to undertake rail safety work if there is any presence of alcohol or a proscribed drug in their system. Rail transport operators are required to have a Drug and Alcohol Management Program in place, which includes drug and alcohol testing. Rail transport operators in New South Wales are subject to additional requirements for drug and alcohol testing under the RSNL (chapter 4). The Commission is recommending that these requirements be removed, along with other derogations from the national laws (recommendation 4.1).

From 1 July 2019, drug and alcohol testing has been mandatory after prescribed incidents. These incidents include an accident or incident that has caused death, serious injury or significant property damage or a collision at a level crossing between rolling stock and either a road vehicle or a person.

The RSNL also provides for testing of rail safety workers by ONRSR for the presence of a drug or alcohol. Drug and alcohol related offences include:

- the presence of illicit drugs or alcohol
- the refusal of a rail safety worker to submit to a drug or alcohol test
- attempts to interfere or tamper with drug or alcohol test samples.

The rate of positive drug or alcohol test is low (table 6.2).

Table 6.2 Rail industry drug and alcohol testing, 2017-18

<i>Test type</i>	<i>Number of tests — ONRSR testing</i>	<i>% positive — ONRSR testing</i>	<i>Number of tests — Industry testing</i>	<i>% positive — Industry testing</i>
Drug	794	0	43 608	0.383
Alcohol	1 171	0	473 931	0.025

Source: ONRSR (2018a, p. 63).

Rail worker fatigue management

Under the RSNL, rail safety workers must not undertake duties while impaired by fatigue or if they may become so impaired. Similar obligations also apply to rail transport operators. In addition, the RSNL requires accredited rail transport operators to prepare and implement a safety management system which includes a fatigue risk management program. The New South Wales and Queensland Governments mandate outer work limits through a schedule to the Rail Safety National Law National Regulations 2012 (chapter 4).

Safety effects of work limits

Several inquiry participants stated there is little evidence that mandated outer work limits achieve safety benefits compared to risk-based approaches. In 2018, ONRSR reviewed the fatigue risk management requirements under the RSNL, including the New South Wales and Queensland requirements. In its Consultation Paper for that review, ONRSR stated that:

No evidence was presented that prescribed outer limits for train drivers provided safer outcomes than a risk based framework and no submissions presented scientific evidence for the basis of the current outer limits. No evidence was presented that fatigue is not being adequately managed under the existing framework either. (2019a, p. 26)

The Australasian Railway Association concurred:

The industry is not aware of any strong evidence that supports the safety case that prescribed hours of work for train drivers in NSW and Qld is an effective tool to manage fatigue. (sub. 26, p. 23)

The Rail, Tram and Bus Union argued in favour of limits on work hours.

Based on current practice within other countries and occupations — and taking an evidence-based approach to risk from fatigue — hours of service limits are a central part of fatigue risk management within the rail industry, with additional fatigue risk management strategies incorporated within these limits. (sub. 10, p. 8)

Hours of work and rest are an essential element of fatigue risk management. The salient questions for the rail sector are whether limits on work and rest hours should be prescribed in legislation or regulation, and whether a single set of limits should apply for all rail transport in Australia.

A single national system makes sense for rail fatigue management. The hours of work requirements in New South Wales and Queensland impose costs on the industry and reduce the efficiency of the rail network. In some cases, a single journey encounters different fatigue management requirements at different sections of track, due to jurisdictional derogations or requirements of rail infrastructure managers. This will also affect future infrastructure, including the Inland Rail project, where operators will encounter different fatigue management requirements in Victoria (no prescribed outer limit on hours), New South Wales (9 hour maximum shift), and Queensland (9 hour shift with 8 hours driving).

The risks associated with fatigue are related to other factors, including operator experience, train technology, the route being travelled and the time of day. No single set of prescribed hours can reflect the risks of every train journey. The national system for fatigue risk management should apply a risk-based approach, with an overarching obligation on rail operators to ensure that rail workers are not impaired by fatigue. Rail operators would have to have their fatigue management systems approved by ONRSR.

RECOMMENDATION 6.4 — RISK-BASED FATIGUE MANAGEMENT IN RAIL REGULATION

The Transport and Infrastructure Council should endorse amendments to the Rail Safety National Law and any relevant State, Territory and Australian government laws and regulations to promote a nationally-consistent risk-based approach to fatigue management regulation for rail transport.

The amendments to the Rail Safety National Law and other legislation should remove detailed fatigue management requirements from legislation and empower the National Rail Safety Regulator to:

- publish 'acceptable means of compliance' with fatigue management regulations
- set outer limits on driving hours
- provide concessions from prescribed aspects of fatigue management regulation, where the National Rail Safety Regulator is satisfied that more effective systems of fatigue management are in place.

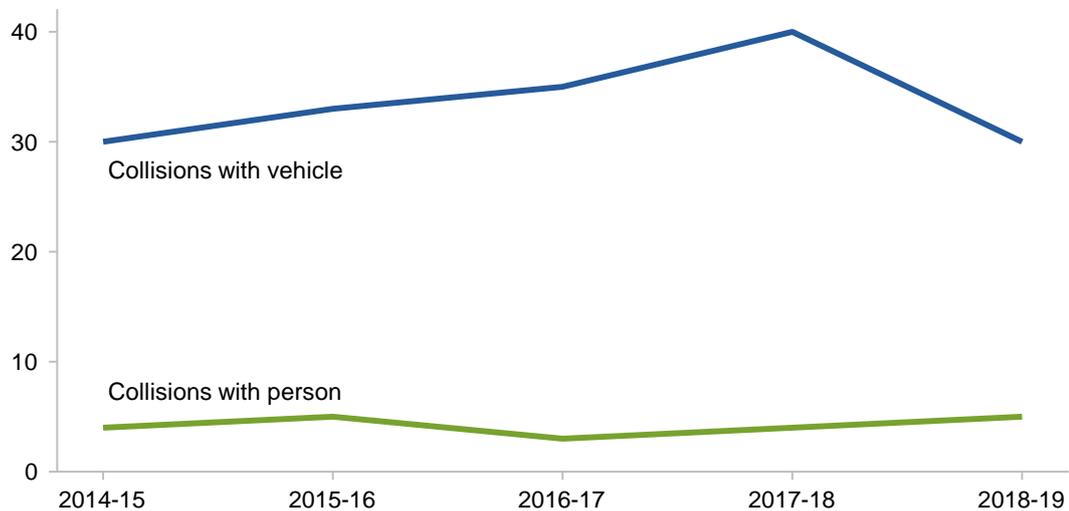
Level crossing safety

After trespass and suicide, accidents at railway crossings account for the largest number of railway-related fatalities involving members of the public. Most level crossing collisions involve a train or rolling stock colliding with a road vehicle (figure 6.9). In 2018-19, there were 30 such occurrences, compared with 5 level crossing collisions with a person or pedestrian during the same period.

The Australian Transport Safety Bureau has recommended that State and Territory governments ensure unnecessary railway crossings are eliminated (ATSB 2008). State and Territory governments have taken steps to minimise the risks associated with level crossings (box 6.4). In addition, between 2008 and 2010, the Australian Government provided funding for the installation of boom gates and other safety measures at 300 high risk rail level crossing sites across Australia (Australian Government 2009, p. 5).

Figure 6.9 Level crossing collisions

2014-15 to 2018-19



^a This chart includes data for Queensland and Western Australia from before they transferred regulatory responsibility to ONRSR. (2 Nov 2015 for WA and 1 July 2017 for Qld). Data exclude Victorian operators regulated under state legislation for the whole reporting period.

Source: Commission estimates based on ONRSR (unpublished).

Box 6.4 Level crossing removals in Australia

Most Australian jurisdictions have programs in place to improve safety at railway crossings by raising or lowering the rail track or closing the crossing.

- The Victorian Government established the Level Crossing Removal Project in 2015. As of February 2020, 34 crossings have been removed (of a targeted 75).
- In July 2019, the South Australia Government completed the Oaklands Crossing Grade Separation Project, which removed a level crossing 12.8km south of Adelaide.
- The Western Australian Government has a Level Crossing Removal Project, which will remove up to six level crossings on the Transperth rail network along the Midland and Armadale lines.
- In 2013-14, the Queensland Department of Transport and Main Roads funded the removal of two level crossings at Geebung and Bracken Ridge. Both of these removals involved constructing a road overpass.

Sources: DPTI (2019); Metronet Western Australia (2019); QLD TMR (2014) Vic LXRP (2019).

Interface agreements

The RSNL requires rail transport operators and/or road managers (typically local councils) to enter into an agreement to coordinate their management of safety risks at interfaces

(ONRSR 2019b). Interfaces include level crossings and other areas where a railway crosses a public or private road or footpath (including by a bridge, tunnel, overpass or underpass). Parties to an interface agreement are required to identify, assess and manage any risks to safety that may arise from railway operations at an interface.

ONRSR noted that although the requirement for interface agreements has been in place since 2006, only 57 per cent of required level crossing agreements were in place in 2019 (sub. DR68, p. 13). Inquiry participants raised concerns about the process of negotiating agreements that are likely to have contributed to the relatively slow completion of agreements (box 6.5).

Since the commencement of this inquiry in April 2019, governments and ONRSR have taken steps to progress the completion of interface agreements. From 1 July 2019, parties that have not complied with their interface agreement requirements face fines of up to \$50 000 for an individual or \$500 000 for a body corporate. ONRSR stated that in the six months following the introduction of the fines ‘the number of outstanding interface agreements has reduced by 4 per cent’ (sub. DR68, p. 14). ONRSR has also held workshops with local governments to discuss ‘options to resolve any outstanding interface agreements’ (sub. DR68, p. 14). These steps should reduce the number of outstanding interface agreements.

Box 6.5 Stakeholder concerns about interface agreements

The Municipal Association of Victoria raised concerns about how risks are allocated in interface agreements:

Councils have encountered issues in negotiating interface agreements and recognise the potential of the legislation to transfer risk and existing maintenance responsibilities of rail operators to the council, without authority for councils to influence decisions. (sub. 15, p. 12)

The Australasian Railway Association and Arc Infrastructure raised concerns about local council resourcing and capacity.

While the RSNL suggests road managers should investigate risks with rail operators, it is the RTOs [rail transport operators] that ultimately own the risk and hence have an incentive to resolve these interface issues. In contrast it can be challenging to get the road manager to engage in these issues, particularly local councils and local land owners who may not realise what their obligations are and are unlikely to understand what is required in an interface agreement. (ARA, sub. 26, p. 36)

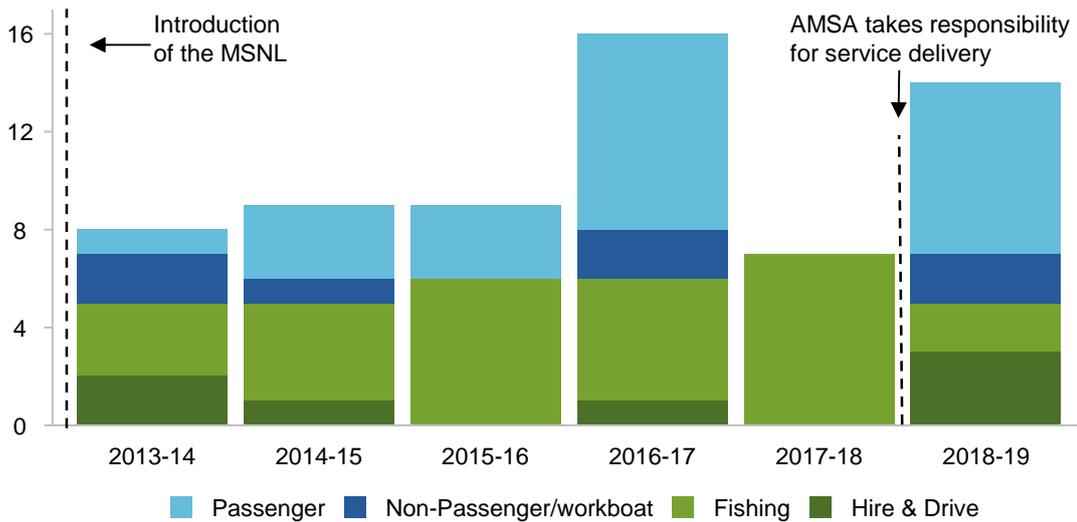
Arc has engaged in educational processes with local governments, but a lack of resources and high staff turnover within local government mean that information is often not retained by some local governments. This creates challenges in meeting safety interface agreement obligations and increases costs for both local government and Arc. (Arc Infrastructure, sub. 17, p. 12)

6.4 Domestic commercial vessel transport safety

Compared with other modes of transport, the number of fatalities associated with domestic commercial vessels is low. Data provided by the Australian Maritime Safety Authority (AMSA) show that there were 63 fatalities associated with domestic commercial vessels between 1 July 2013 (the introduction of the Marine Safety National Law (MSNL)) and

June 2019. Of these, about 43 per cent were associated with fishing vessels, and 35 per cent were associated with passenger vessels (figure 6.10).

Figure 6.10 **Fatalities associated with domestic commercial vessels^{a,b}**
July 2013 to June 2019



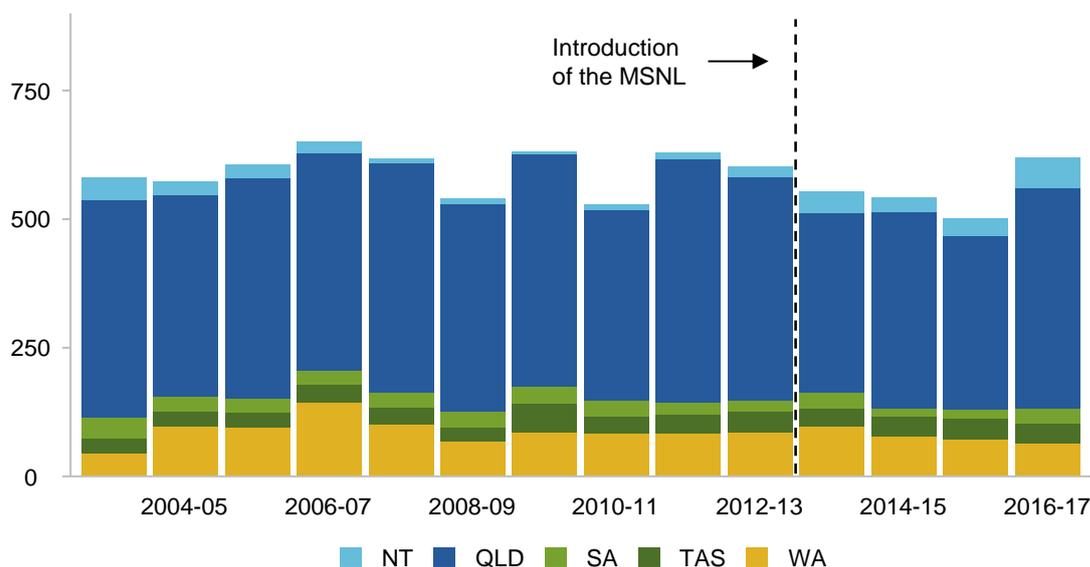
^a Data underlying this chart were received from AMSA in February 2020. AMSA noted that updates to the data can occur over time. ^b Some fatalities reported are not related to matters that are directly under AMSA's remit. For example, about 20 per cent of all reported fatalities are associated with heart attack or unknown illness, while another 15 per cent are associated with scuba diving and snorkelling.

Source: Commission estimates based on AMSA (unpublished).

Domestic commercial vessel (DCV) safety outcomes are influenced by many factors, including: the vessel's area of operations; the experience, qualifications and health and fitness of the crew; the maintenance history of the vessel; and weather conditions. Moreover, the DCV sector is diverse, which makes it difficult to reach general conclusions about safety — risk factors that apply to fishing operators might not be relevant to hire-and-drive recreational vessels. Safety incident data covering the period 2004-05 to 2016-17 show no significant change in incident rates after the introduction of the MSNL on 1 July 2013 (figure 6.11).

Figure 6.11 There has been no significant change in the reporting of safety incidents under the MSNL^{a,b}

Number of maritime incidents, July 2003 – June 2017



^a Data underlying this chart were received from AMSA in September 2019. Data were not provided for NSW and Victoria. AMSA noted that updates to the data can occur over time. ^b AMSA estimates from August 2016 indicate that there were 6859 vessels registered in Qld, compared with 7411 registered in SA, WA, Tasmania and the NT collectively. There were a further 9130 and 1725 vessels registered in NSW and Vic respectively.

Source: Commission estimates based on AMSA (unpublished).

Developments in maritime safety policy

This section sets out the Commission’s assessment of the data on DCV safety, changes to the vessel survey regime, and the grandfathering of pre-MSNL regulations for certain DCVs.

Data collection and publication

Gaps in AMSA’s DCV data affect its ability to identify trends and target enforcement toward higher-risk vessels and operators. AMSA is working to address legacy issues arising from the poor quality of the data inherited from State and Territory agencies (appendix B). Gaps in the data could also arise from under-reporting of safety incidents by DCV operators.

AMSA noted in its submission that a ‘challenge for AMSA is strengthening the incident reporting culture in the domestic commercial vessel fleet’ (sub. 35, p. 8). Improving incident reporting and data publication would increase transparency and inform risk-based approaches to regulation and enforcement. Analysis of safety data could add significant value for industry through research and policy development.

RECOMMENDATION 6.5 – IMPROVE MARITIME INCIDENT REPORTING AND DISCLOSURE

The Australian Government should direct the Australian Maritime Safety Authority to take steps to improve:

- incident reporting by owners of domestic commercial vessels
- its public disclosure of safety incidents.

AMSA should report fatalities and injuries in greater detail, including a state-by-state and vessel-type breakdown of fatalities and injuries.

Vessel survey

All domestic commercial vessels are required to have a certificate of survey under the national law, unless an exemption applies. Survey requirements vary depending on the type of vessel, its use and location. Under the systems that preceded the introduction of the MSNL, each State and Territory government established survey requirements and exemptions. Some vessels were required to undergo annual survey, others only an initial survey. In Queensland, survey was entirely voluntary.

A new survey regime for domestic commercial vessels commenced on 1 July 2018, through changes to Marine Order 503 (AMSA 2018). Changes to the survey regime included:

- reducing periodic survey requirements for the majority of domestic commercial vessels (up to once every five years) based on an assessment of their safety risk
- expanding the category of vessels exempt from surveys (such as vessels fewer than 12 metres in length or human powered vessels)
- providing more flexibility in the timing of surveys, to ensure that vessel maintenance activities can be better aligned with surveys.

The changes to the vessel survey regime followed a streamlining review of the national system in 2014, which identified various issues with the previous survey arrangements. For example, survey requirements were not well aligned with risks; high risk vessels were not accurately and consistently identified; and survey requirements were not in line with new technologies and operational needs.

Vessel surveying provides an important opportunity for structural or mechanical issues to be detected by AMSA. While certain vessels will be surveyed less frequently, the changes overall appear to be in line with AMSA taking a risk-based approach to regulation. Properly executed, these changes have the potential to reduce the regulatory burden for much of the domestic maritime sector, without increasing safety risks. One impediment to risk-based regulation of DCVs is the grandfathering of certain vessels, which exempts them from survey requirements. These exemptions reduce the regulator's visibility of parts of the DCV fleet and its ability to take a risk-based approach to regulation. The issue of grandfathering is discussed below.

Grandfathering

Grandfathering is a barrier to nationally consistent safety regulations (chapter 4) and also raises safety concerns, including:

- gaps in information about the DCV fleet
- delayed adoption of new safety standards and requirements
- delayed investment by owners in new equipment and vessels
- less thorough maintenance
- incentive to extend the working life of grandfathered vessels because of lower operating costs and the higher cost of replacement vessels.

AMSA has limited visibility of grandfathered vessels — it does not know with certainty how many vessels are subject to grandfathering, the type of grandfathering or the composition of the grandfathered vessel fleet. AMSA has stated that this is due to many grandfathered vessels not being required to have a certificate of survey (AMSA 2019, p. 21).

No data is available to determine whether safety outcomes for grandfathered vessels are worse than non-grandfathered vessels. However, stakeholders raised concerns that permitting older vessels to operate under less stringent rules increases the risks of safety incidents (box 6.6).

The case for winding up grandfathering

In the draft report, the Commission proposed winding up grandfathering provisions. The Department of Infrastructure, Transport, Regional Development and Cities stated that grandfathering provisions could only be removed after investigation and consultation, and a consideration of safety evidence, data and costs and other impacts on industry (DITRDC, sub. DR74, p. 3). AMSA noted that its approach to grandfathering was informed by its 2012 regulatory plan which stated that ‘grandfathering arrangements would continue to apply unless incident data dictated the need to adopt an alternative approach’ (AMSA, sub. DR71, p. 10).

The Commission agrees that grandfathering arrangements should only be wound up if the benefits would exceed the costs, and that any proposal to wind up grandfathering arrangements should be informed by a thorough assessment of the options.

The benefits of winding up grandfathering would include reducing safety risks, reducing the costs of regulation for cross-border operators through harmonisation and reducing the cost of administering the MSNL. Several inquiry participants identified these benefits and argued in favour of winding up grandfathering (box 6.7). However, given the lack of evidence on the effects of grandfathering on safety outcomes, it is not possible to estimate the size of these benefits.

Box 6.6 Grandfathering presents potential risks to safety

Stakeholders consulted during the development of the Decision Regulation Impact Statement for *Survey under the National System for Domestic Commercial Vessel Safety*:

... felt that the current arrangements did not support the implementation of strong maintenance practices as they did not provide an incentive for operators to maintain the vessel to the required standard through, for example, reduced survey requirements. (AMSA 2017b, p. 13)

AMSA has suggested that grandfathering poses various safety risks:

Over the six years since the commencement of the National System, incidents — including fatalities — have highlighted problems with some of the vessel standards, survey and crewing arrangements that have been grandfathered to align with pre-national system vessel standards, and that, in some cases, the grandfathered arrangements pose risks to safety, property and the environment.

State and Territory coroners have recommended the removal of grandfathering for domestic commercial vessels, especially fishing vessels which tend to be older, subject to more exemptions historically, and operate in higher risk conditions and operations. AMSA's view is that incident data warrants a reconsideration of the grandfathering arrangements inherited with the national system, with a view to winding back those aspects which are unsafe.

AMSA has ended some grandfathering arrangements for carriage of safety equipment, operational requirements and periodic survey requirements for most vessels. However there remains a large section of vessels that entered commercial service before the national system commenced that are still permitted to comply with the crewing, construction and design requirements that applied on 30 June 2013. Importantly, many of these vessels were not required to have a survey certificate or undergo a routine survey inspection regime – not only do these arrangements create an uneven playing field, but create safety risks as vessel modifications that affect the operation of the vessel go undetected. AMSA considers that continuation of these arrangements into the future, indefinitely, is out of step with community expectations of the commercial vessel sector.

AMSA acknowledges that the grandfathering arrangements were a central principle of the National Law agreed by policy makers and changes may have significant cost impacts, particularly for owners and operators of older vessels. Nonetheless, we consider that preserving grandfathering arrangements, in their current state, is not sustainable and that current grandfathering arrangements need to be addressed for the safety of persons on board these vessels. (sub. 35, p. 10)

The Maritime Union of Australia stated that:

... the current [grandfathering] arrangements are a threat to crew and public safety. (sub. 37, p. 45)

Similarly, the Australian Institute of Marine Surveyors considered that:

The most serious impacts on safety outcomes are those that may occur due to the reduced survey scheme that does not capture those grandfathered vessels that are old and poorly maintained. (sub. 73, p. 6)

In relation to an inquest into the death of three fishermen in 2015, the Western Australian Coroner recommended that:

... AMSA, as the National Regulator of the National Law, should give consideration to establishing a transitional approach to ending the grandfathering of safety standards for existing vessels. Compliance with current standards in regard to vessel operations and safety equipment should be given priority. (Coroner's Court of Western Australia 2018)

Box 6.7 Agreement that grandfathering should be wound up

Stakeholders had differing views on why grandfathering should be removed (whether for consistency, regulatory cost or safety), and how. There was general agreement that in principle, grandfathering should be removed.

Prior to the draft report, the Maritime Union of Australia stated proposed that:

... the Commission recommend to the Australian Government that grandfathering provisions be phased out ... (sub. 37, p. 45)

Subsequently, the Maritime Union of Australia supported the Commission's draft recommendation 5.5 that grandfathering be wound up (sub. DR77, p. 3). Other participants that supported draft recommendation 5.5 include the Western Australian Government (sub. DR81, p. 4) and the Australian Institute of Marine Surveyors (sub. DR73, p. 11).

In addition, Maritime Industry Australia Limited stated that:

MIAL agrees that grandfathering should be phased out, so as to ultimately ensure harmonised standards across the DCV space. (sub. DR56, p. 2)

Grandfathering has gone on too long according to the Queensland Department of Main Roads:

While Queensland was initially supportive of adopting some grandfathering provisions ... it is now six years since the enactment of the National Law and we are seemingly no closer to a consistent national standard. (sub. 28, p. 4)

AMSA agreed that grandfathering needs to be addressed:

... we consider that preserving grandfathering arrangements, in their current state, is not sustainable and that current grandfathering arrangements need to be addressed ... (AMSA, sub. 35, p. 10)

Winding up grandfathering would have costs for vessel owners

Removing grandfathering concessions could lead to vessel owners being required to modify the structure of their vessels, install new equipment or change their crewing arrangements. All of these requirements would impose costs (box 6.8). Some inquiry participants observed that Australia does not have the boat-building capacity to carry out the structural modifications that could be required for some vessels that are currently grandfathered. Where this is the case, removing grandfathering could leave these vessels as 'stranded assets'.

Box 6.8 Potential costs of winding up grandfathering

In response to draft recommendation 5.5, the Commission received feedback outlining the potential costs and impacts to industry should all grandfathering be removed within the next 5 years.

The Northern Territory Government raised concern about the ability and cost of grandfathered vessels in the Northern Territory to meet modern standards:

While agreeing with the principle of the need for consistency between jurisdictions, the Northern Territory Government does not support this draft finding and recommendation. There are approximately 600 grandfathered survey exempt vessels in the Northern Territory, approximately 500 of which are commercial fishing vessels (mainly under five or eight metres), with the remaining 100 including police and parks and wildlife vessels under five metres. If grandfathering was removed, most of these vessels would not be able to meet survey requirements and the cost to meet full survey standards would be prohibitive.

The Northern Territory's position is that vessels which met regulatory and safety requirements at the time of their initial survey and are currently approved for grandfathering provisions should retain this status if exemption requirements continue to be met. (sub. DR64, p. 6)

The Department of Infrastructure, Transport, Regional Development and Communications submitted that:

The proposal to phase out all grandfathering arrangements within five years (draft recommendation 5.5) would impose significant costs, and may even put smaller operators out of business, without necessarily increasing safety outcomes. For example, anecdotal advice from AMSA indicates the cost to industry to upgrade vessels to more modern (but not current) standards may be in the order of several hundred thousand dollars per vessel. (sub. DR74, p. 3)

There were concerns by some as to the timeline proposed by the Commission:

MIAL agrees that grandfathering should be phased out, so as to ultimately ensure harmonised standards across the DCV space. However, imposing an arbitrary deadline where, as the PC correctly notes, there is limited data to determine what kind of timeline might best reflect the risk profile of domestic commercial vessels is not supported.

As the draft report itself notes, DCV's are long term assets, often with a viable commercial life spanning 30 years and beyond, during which time many of the structural changes that would be required to be made if grandfathering were to cease within the suggested timeframe would not be viable, resulting in a large number of stranded assets, having a significant and unreasonable impact on a large portion of the industry. (Maritime Industry Australia Limited, sub. DR56, p. 2)

A way forward: improving the evidence base through survey

The evidence base is sparse, and it is not possible to quantify the benefits or costs of removing any particular grandfathering provision. However, a lack of information is not an argument to retain the status quo. The first step towards a risk-based approach to grandfathering provisions is to expand the evidence base by surveying all DCVs.

The 2018 reforms to the vessel survey regime maintained grandfathering for vessels that were never previously required to hold a certificate of survey. The 2017 Decision Regulation

Impact Statement for these reforms found that survey of all vessels, including grandfathered ones, has the potential to result in significant benefits:

A vessel that is built and maintained to the required standard is less likely to be involved in an incident and, where an incident does occur, it is less likely to result in a serious or fatal injury. By supporting safety in the Australian domestic commercial vessel fleet, vessel surveys provide considerable indirect benefits to the maritime industry and the Australian economy. (AMSA 2017b, p. 5)

The data collected from periodic survey by accredited marine surveyors would be valuable to AMSA in building its understanding of the vessel fleet, its assessment of risk and informing policy choices. The Australasian Institute of Marine Surveyors supported a collaborative effort:

Our surveyors have a unique opportunity to assist and work with AMSA in the provision of factual data on the condition of the fleet and the take-up and implementation of appropriate fit-for-service — fit-for-purpose safety management practices by vessel owners and operators. (AIMS, trans., p. 194)

Once AMSA has acquired survey evidence about the domestic commercial vessel fleet and any safety risks and concerns it will be better positioned to assess the benefits and costs of removing grandfathering provisions on a case-by-case basis.

The costs of vessel survey

According to the Regulation Impact Statement for the 2018 vessel survey reforms about 6000 vessels were operating under grandfathered arrangements, where no survey is required, with the vast majority of these vessels operating in Queensland. (AMSA 2017a, p. 18). Removing these grandfathering arrangements would have costs for vessel operators (AMSA 2017b, p. 5). The costs of survey vary depending on the characteristics of the vessel — there is no ‘benchmark’ to estimate the cost of requiring previously exempt vessels to undergo survey.

The Commission’s judgment is that the potential costs to industry and AMSA are justified. The current situation leads to risks to DCV operators, mariners and the general public. Complete information about the DCV fleet is an essential input into AMSA’s work as a risk-based regulator. The removal of grandfathering could be rolled out to spread the work of vessel survey over an extended period and avoid shortages of qualified surveyors (and the resultant price increases).

What about vessels that are unable to meet the requirements of a modern survey?

Inquiry participants have advised that in some cases (particularly older vessels) conducting a modern survey is not possible, due to structural constraints (such as areas of the vessel being blocked off due to design) or missing vessel plans and designs. These complications should not exempt such vessels from being covered by the new requirements. In other areas

where AMSA has recognised the potential difficulty (structural, financial or otherwise) of vessels meeting modern standards, AMSA has required compliance with ‘transitional standards’ rather than the standard applicable to an equivalent new vessel. Consistent transitional standards, administered by AMSA under the MSNL are preferable to remaining under disparate, outdated grandfathered provisions.

Where a vessel is unable to undertake a modern survey, AMSA should adapt to the situation at hand and adopt a similar methodology to transitional standards used by AMSA elsewhere in the MSNL. This may involve the use of inspections to supplement survey, in order to obtain as much information as possible about a vessel.

All passenger vessels should have smoke detectors

As noted in chapter 5, grandfathering provisions mean that some DCVs are not required to have fire and/or smoke detection systems in passenger accommodation areas. The absence of smoke detectors increases the risk of harm to people and is not in line with community standards. The Commission agrees with AMSA that ‘smoke detectors are a no-brainer’ (trans., p. 238). Unwinding grandfathering provisions that relate to smoke detectors should be a priority.

RECOMMENDATION 6.6 – END GRANDFATHERING OF VESSEL SURVEY REQUIREMENTS

The Council of Australian Governments and the Australian Maritime Safety Authority should wind up the grandfathering of safety regulations under the Marine Safety National Law. Priority should be given to ending grandfathering arrangements that relate to vessel survey requirements and fire detection and smoke detection systems.

The Australian Maritime Safety Authority should use the information from vessel survey and other sources to review the safety risks arising from other grandfathering arrangements and the costs to vessel operators of removing the arrangements. Where the safety benefits exceed the costs, grandfathering arrangements should be removed.

7 Have the COAG reforms raised productivity?

Key points

- The COAG transport reforms were expected to deliver more than \$12 billion in productivity gains — \$9 billion was attributed to greater road access for more productive heavy vehicles.
- With the limited information available, it is not clear whether compliance costs have fallen overall, although it is likely they have in rail. The regulators should monitor and report these costs as part of their efforts to deliver cost-effective regulation.
- There is also limited evidence on the costs of administering key regulatory activities by regulators. The three national regulators should publish more disaggregated information on their administrative costs.
- Some road managers have made progress in improving heavy vehicle access — both through expanding as-of-right access, and permit pre-approvals allowing access to be granted faster. This has encouraged some heavy vehicle operators to invest in more productive vehicles.
 - Despite some progress, there have been few changes to access on key freight routes. Furthermore, while the number of higher productivity vehicles has increased, the increase is small relative to the size of the whole heavy vehicle fleet. The B-double remains the workhorse freight vehicle.
- Improvements in heavy vehicle access and the use of higher productivity vehicles are likely to have benefited some operators. However, they have not led to large changes in heavy vehicle performance at a national level. The productivity gains have been far smaller than the original optimistic estimates.
- A key barrier to heavy vehicle access is that some road managers do not have adequate expertise or resourcing to fully understand complex vehicle characteristics and the capacity of their road infrastructure.
- The following incremental changes would improve the heavy vehicle access system and lead to productivity gains:
 - more flexible permit pre-approvals, including those based on risk rather than specific vehicle types
 - more as-of-right access for higher productivity vehicles on key freight routes. There is also scope to further develop gazetted networks for vehicles that are commonly approved via permit, and for Performance-Based Standards vehicles
 - more public information on access permit decisions and processing times. This would inform industry and help identify areas that might require more resources to help improve access.
- The National Heavy Vehicle Regulator can play a role in facilitating heavy vehicle productivity but broader reform is needed to achieve the largest productivity gains.

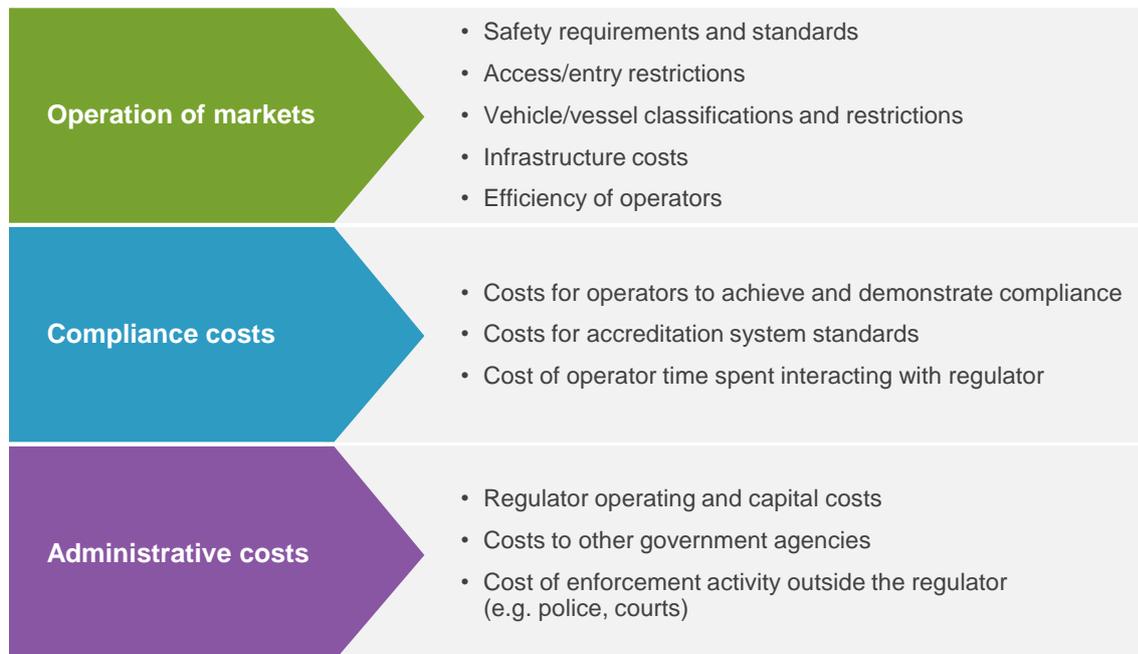
7.1 Introduction

Productivity improvements in the transport industry can have significant implications for the national economy. Transport, postal and warehousing represented 4.5 per cent of GDP and 5.1 per cent of total employment in 2018-19 (ABS 2019a, table 6; 2019b, table 4). The shares are larger, at 7.4 per cent of GDP and 8.6 per cent of total employment in 2015-16, when including in-house transport activity by businesses outside the transport industry (for example, agriculture and construction) (ABS 2018a, table 1, table 10).

Road transport (including heavy vehicles) represents half of the transport sector's output (Commission estimates using ABS (2018a, table 2)). Rail transport accounts for 6.4 per cent and water transport (including domestic commercial vessels) accounts for 6.7 per cent.

A key driver of productivity relates to the decisions of operators in the industry. The regulatory environment influences the productivity outlook, affecting the cost structure of operators, how markets operate, and the degree of innovation by operators. The design of regulation and practices by regulators can also affect productivity. As discussed in chapter 2, if operators can meet regulatory safety outcomes in a flexible rather than prescriptive way, this can provide avenues for innovation and productivity while maintaining or improving safety. The costs of operators complying with regulation and the administrative costs of regulators also affect productivity (figure 7.1).

Figure 7.1 **How the regulatory system affects productivity**



Improving productivity through regulatory change is complex. Transport regulation is important because the sector involves major safety risks, complex planning issues and public good elements with respect to infrastructure provision. Infrastructure provision and maintenance have major costs, particularly for road and rail. The regulatory framework needs to balance these elements.

Productivity gains expected from the national reforms

The largest productivity gain from the national reforms was expected to come from improved access for larger heavy vehicles. The Heavy Vehicle National Law (HVNL) regulation impact statement estimated gains of over \$12 billion over 20 years in net present value, \$9 billion of which was attributed to improved heavy vehicle access (table 7.1). Promoting productivity and efficiency is an explicit objective in the HVNL.

Another source of productivity gain was reduced compliance and administrative costs in the three transport sectors, to be achieved through the replacement of multiple State and Territory regulatory regimes with national laws and regulators. Overall, modest benefits were expected from rail and domestic commercial vessel reforms relative to the heavy vehicle reforms (table 7.1).

Table 7.1 Expected benefits from the COAG reforms
Net present value at the time of the regulation impact statements

<i>Transport mode</i>	<i>Expected benefit (\$billion)</i>
Heavy vehicles (over 20 years)^a	
Access for restricted access vehicles	7.0
Access for Higher Mass Limits vehicles	1.8
Intelligent Access Program	1.2
Fatigue – Chain of Responsibility	1.0
Other	1.4
Total	12.4
Rail (over 10 years)	0.028 to 0.071
Domestic commercial vessels (over 20 years)	0.102 to 0.126

^a Top-down analysis, best-bet scenario.

Sources: NAMSRS (2009, p. 10); NTC (2011a, p. 15, 2011b, p. v).

Compliance and administrative costs in the three transport sectors are first examined in this chapter (sections 7.2 and 7.3). Then the effect of the national reforms on heavy vehicle access and productivity is examined (sections 7.4 and 7.5), in line with the inquiry's terms of reference. Some incremental future reforms to promote heavy vehicle access are proposed in section 7.6. Future reforms that lie beyond the scope of the regulators are discussed in chapters 8, 9 and 10.

7.2 Compliance costs and regulatory burden

Compliance or regulatory burden are costs in terms of dollars, time and labour, incurred by industry in adhering to regulation (but does not include fees charged by regulators). The challenge for legislators and regulators is to achieve desired outcomes with minimum cost and disruption to individuals and businesses. The compliance costs borne by industry participants are higher when:

- laws and regulations are complex, or difficult to interpret
- there are different arrangements in different jurisdictions
- rules are subject to exemptions
- enforcement arrangements are unclear and involve multiple players
- regulatory activities are inefficient.

To varying degrees, all of these factors apply to the three transport modes. Some factors are unavoidable, especially in the early stages of consolidating disparate State and Territory laws into national laws.

Compliance cost information for heavy vehicles, rail and maritime has not been systematically collected and reported by the regulators. The Commission sought information about compliance costs through submissions, discussions with interested parties from all three transport sectors, and in the case of heavy vehicles, at four regional truck stops. While the Commission consulted widely, feedback on this matter was limited — few stakeholders commented on the effect of the regulatory systems on compliance costs. Therefore, the evidence obtained is indicative only.

Heavy vehicles

The requirements on operators and drivers of heavy vehicles are extensive. Some of this can be justified by the dangers inherent in heavy vehicles operating on shared roads. Compliance costs are incurred to ensure adequate safety and balance the challenges of heavy vehicle access with community amenity and road infrastructure costs.

Feedback from the heavy vehicle industry suggests that there has been no obvious trend towards higher or lower compliance costs. Broad comments from industry include:

The HVNL's objective, as stipulated by the [National Heavy Vehicle Regulator], has not yet been met, in any of its three criteria [one being minimising regulatory burden and therein compliance costs], at this time. (MTA-SA, sub. 42, pp. 2–3)

With regards to road transport, the reforms as they currently stand are still a far cry from the [regulation impact statement's] anticipated levels of benefit/burden reduction. (SAFC, sub. 6, p. 7)

Compliance costs associated with heavy vehicle access

Access permit applications are one key source of compliance cost for heavy vehicle operators. The National Heavy Vehicle Regulator (NHVR) has put significant resources into the NHVR Portal, designed to provide a one-stop shop for operators to apply for access permits. One permit can now cover multiple vehicles and multiple routes or areas. Heavy vehicle operators only need to submit one renewal application to renew multiple permit routes. Communication with road managers is now managed automatically within the Portal (NHVR, pers. comm., 24 October 2019). Additionally, the NHVR began moving services for the National Heavy Vehicle Accreditation Scheme (NHVAS), vehicle standards exemptions, and Performance-Based Standards (PBS) scheme onto the Portal in 2018-19. These changes improve simplicity and flexibility for industry by providing them with a single source of business information. As stated by Toll Group:

The NHVR Customer Portal is an improvement over the earlier systems, reducing the administrative burden of applying for permits. The addition of registrations and, in the near future, accreditations, will further increase the usefulness of the Portal. (NHVR 2019a, p. 24)

However, delays in permit processing times (described in section 7.5) and administrative tasks involved in maintaining permits can still cause significant costs for operators. The Australian Trucking Association (sub. 32, p. 8) provided an example of a large livestock carrier that experienced an increase in regulatory burden as a result of the national reforms. This was due to the added process of consulting local governments in Queensland, requirements to renew permits more often and the need to amend permits with each new vehicle added to the fleet.

Along with permit processes, road managers and the NHVR have been working to gazette and pre-approve routes for heavy vehicles. These changes likely reduced compliance costs for some transport operators by reducing the need to apply for permits or to wait for permits to be approved. For example, the Motor Trade Association of South Australia/Northern Territory stated that:

... members have reported some productivity increases from national heavy vehicle reform efforts through gazetted routes. (sub. DR47, p. 5)

Jurisdictional differences and harmonisation

Differences in jurisdictional restrictions also continue to contribute to higher regulatory burden. As noted by Gas Energy Australia (sub. 5, p. 3):

An example which highlights the need for harmonisation of state and territory regulations involves a heavy vehicle (LPG Bobtail tanker) travelling from NSW to a workshop in Queensland for a 3-week overhaul. An oncoming vehicle threw a stone which cracked the windscreen. The vehicle was shortly thereafter stopped by a roadside inspection and an NSW infringement notice issued requiring the defect to be cleared within 2 weeks. The workshop in Queensland that was conducting the overhaul was not able to clear an infringement issued in NSW. The vehicle owner had to postpone the overhaul and clear the defect with an NSW authorised repairer. This had a

monetary cost of approximately 2-man days plus vehicle costs, incurred in clearing a defect with respect to jurisdictional requirements before it could commence its overhaul and highlights the need for cross border recognition and consistency in application.

Drivers consulted by the Commission referred to small differences in State and Territory access conditions resulting in regulatory burden, and potentially significant fines. Some notices allow for higher mass limits for particular vehicles only within state borders (NHVR 2020e). For example, the South Australia Class 3 (Application of Higher Mass Limits) Mass Exemption Notice 2020 allows the mass of triaxle groups on some vehicles to be 22.5 tonnes in the state, compared with 20 tonnes under general mass limits. The infringement penalty for minor non-compliance with mass requirements is \$447 in 2019-20 (NHVR 2019c, p. 4). The NHVR is working to standardise conditions of operation across jurisdictional borders, which should help to reduce these costs (NHVR 2019e).

The boundaries between HVNL jurisdictions and Western Australia and the Northern Territory are also potential sources of compliance cost due to differences in heavy vehicle requirements. For example, travel into Western Australia requires additional permits and compliance with the Western Australian regime. Under the HVNL, all vehicles above 30 m in length require a 'road train' sign to be displayed at both the front and the rear (NHVR 2020f, p. 1). In Western Australia, vehicles between 22 and 36 m in length with one or more non-dog trailers must display a 'long vehicle' sign at the rear and it is an offence to display a warning sign when not required (Main Roads WA 2018). Vehicles can travel relatively freely into the Northern Territory without additional costs.

Compliance costs associated with safety policies

Other key compliance cost issues raised by operators were related to safety policies.

Some drivers criticised the compliance burden of fatigue management requirements such as driver work diaries. The NHVR estimated that up to 20 million daily paper work sheets are completed by drivers (NHVR 2018a, p. 15). These sheets are retained for at least three years for compliance purposes. NHVR-approved electronic work diaries (EWDs) will become an alternative to paper work diaries, and can reduce the costs associated with record keeping. Currently, there are no approved EWDs (NHVR 2020c). The NHVR is working with technology providers and transport operators to progress their EWD applications (ATN 2019).

Industry participants also criticised the need to submit to multiple audit regimes (such as under TruckSafe and the NHVAS), resulting in higher compliance costs (for example, ALC, sub. DR61, pp. 5–7). Additionally, some large operators in the supply chain conduct their own audits of the business operations of transport subcontractors due to uncertainty about their chain of responsibility obligations and risk aversion (chapter 6). One mid-sized business estimated that its staff managed 14 different industry standards or customer audits, involving 40 days of staff time per year (ATA, trans., pp. 135–136). The Australian Logistics Council (sub. DR61, pp. 6–7) stated that industry is working with the NHVR to

develop common auditing standards to assess the business systems of chain of responsibility parties. The Commission's recommendation to clarify the obligations of regulated parties under Chain of Responsibility laws in the HVNL would help to reduce the burden on operators (chapter 6).

Rail

The Office of the National Rail Safety Regulator (ONRSR) appears to have managed the shift to a national system well. With a small number of relatively sophisticated operators in rail, a co-regulatory and risk-based approach has meant smooth adoption of the new framework.

Delivery through State and Territory agencies under service-level agreements in the transition period did not appear to have prevented the creation of a consistent approach. Establishment of common management structures (even where service-level agreements were in place) is widely regarded as having worked well. ONRSR is also working in consultation with industry to identify areas for improving the efficiency of their regulatory interactions, including their requests for, and exchange of, information (ONRSR 2019, p. 22).

Submissions to the inquiry suggest that regulatory burden has decreased as a result of the national rail reforms and, in particular, the single national accreditation system.

ARTC is strongly in favour of the co-regulatory rail safety model and believes that the formation of the Office of [the] National Rail Safety Regulat[or] (ONRSR), and the move towards nationally consistent regulation, has reduced the regulatory burden on its business. (ARTC, sub. 31, p. 3)

The reforms have undoubtedly led to some improvements in the regulatory regime. In particular, members report that the national accreditation scheme has reduced compliance costs and changes to the accreditation processes for major projects has been beneficial. (ARA, sub. 26, p. 2)

From discussion with members and industry, [SA Freight Council] understands that the regulatory burden for the rail industry has fallen considerably. A single accreditation with a single audit for multi-jurisdiction operations is a major reduction in regulatory burden and cost. (SAFC, sub. 6, p. 7)

ONRSR provided several case studies in their submission detailing how compliance costs have decreased for rail operators (ONRSR, sub. DR68, pp. 10–12). One case study, for example, involved a well-known international company. Under the previous state-based system, the company worked under the safety management systems of network owners in Western Australia, rather than under its own, due to the significant administrative hurdles it would face in gaining accreditation. Many of the hurdles were overcome as a result of the reforms and subsequently, the company applied for and received accreditation.

The Commission has also been provided with results from a stakeholder survey conducted by ONRSR in early 2019 (ONRSR, unpublished). The survey results were mostly positive about the outcomes from a national approach. Against most measures ONRSR was rated as effective or very effective by over three quarters of respondents. The objectives of the

national reforms were defined as improving rail safety, decreasing the regulatory burden on industry, providing seamless national safety regulation and enforcing regulatory compliance. On a scale of 1 to 10, respondents rated ONRSR at slightly over 6 for regulatory burden — average ratings were above 7 for all other measures.

Fatigue management is also a challenge in rail, leading to higher compliance costs. There is some flexibility but prescriptive arrangements in some States and Territories are still the cause of complaints by industry (for example, ARA, sub. 26).

Domestic commercial vessels

The Australian Maritime Safety Authority (AMSA) regulates operators ranging from large multinationals to small operators. AMSA now has direct regulatory engagement with about 22 500 domestic commercial vessels under the new law (AMSA, sub. DR71, pp. 11–12). Consultations carried out by the Commission suggested there are still significant variations in the way the law is administered in each State and Territory and even in different parts of the same State, contributing to the regulatory burden.

AMSA identified the national recognition of marine qualifications, and simplification of certificate of operation requirements for large vessels, as having brought about large cost savings for operators (AMSA, sub. DR71, p. 3).

The Maritime Union of Australia stated that the introduction of the new arrangements saw standards fall in some jurisdictions (sub. 37, p. 12). Similarly, the Tasmanian Government stated that it saw a reduction in the stringency of regulatory requirements, potentially reducing regulatory burden but also possibly raising safety concerns:

In relation to maritime safety, the implementation of the [Marine Safety National Law (MSNL)] has resulted in changes to nationally agreed standards and the regulatory oversight of certain vessels. While these changes may be reflective of the approach to safety that was undertaken in some jurisdictions prior to implementation of the MSNL, it is considered to be a reduction from the approach that was taken in Tasmania. There are significant differences in the operational marine environment in various parts of Australia and it is important to note the effect these environmental differences can have on the approach to safety. (sub. 41, p. 8)

Some level of reduced stringency is to be expected given the nature of harmonising safety regulation; a product of negotiation between States and Territories. Any matters raising safety concern should be investigated and addressed. Safety is discussed in more detail in chapter 6.

Some submissions suggested the transitional issues and the diversity of the domestic commercial vessel sector have resulted in overly complex legislation that leads to higher regulatory burden and would benefit from simplification and clarity (for example, MIAL, sub. 14, pp. 3, 6).

Collecting and reporting on compliance cost information

Harmonising arrangements across States and Territories and increasing flexibility in regulation would help to reduce compliance costs. Recommendations that address these issues are discussed further in chapters 4, 6, 9 and 10. Regulators are also pursuing changes that should help reduce costs.

As noted above, regulators do not systematically collect and report detailed information on compliance costs incurred by industry, making it difficult to assess how regulatory burden has changed. The NHVR and AMSA are aware that there are significant compliance costs from aspects of its activities but do not collect and report information on these costs. ONRSR has conducted stakeholder surveys, and published various performance measures related to regulatory burden (for example, the percentage of surveyed operators indicating that current regulatory arrangements have improved, and the percentage of preliminary audit reports issued within four weeks of an audit (ONRSR 2018, p. 63, 2019, p. 70)). The collection and reporting could be made more informative by capturing information on specific compliance costs incurred by industry.

The Commission acknowledges that systematically collecting detailed compliance cost information from industry is a difficult task. There are numerous operators in each sector, and operators often do not keep track of how much money, time and labour they spend on compliance activities. To allow for the monitoring of regulatory burden, national regulators should nevertheless attempt to ascertain and report on the level and change in compliance costs.

The collection of compliance cost information will involve stakeholder consultation and could, for example, take the form of a survey and/or a number of focus groups (as in the Commission's research on *General Practice Administrative and Compliance Costs* (2003)). If quantitative values cannot be obtained, qualitative evidence would also be useful to provide an indication of costs.

Compliance cost information should be sought by 'key regulatory activity'. Key regulatory activities for this purpose may include for example, drug and alcohol management, fatigue management, chain of responsibility, and maintenance. The Australian Trucking Association (trans., p. 138) considered that reporting should include indirect costs (for example, costs of multiple audits to satisfy chain of responsibility obligations).

Regulators should publish outcomes of their stakeholder consultations periodically, and detail steps they have taken to reduce regulatory burden. The reporting period could be, for example, every three years, which would allow enough time for change to occur and would not impose unreasonable regulatory burden on operators. The first report should be published in 2021 to establish benchmark costs.

FINDING 7.1 – COMPLIANCE COSTS ARE NOT ROUTINELY MONITORED AND REPORTED

Detailed data on the compliance costs for businesses from heavy vehicle, rail and domestic commercial vessel regulation have not been systematically collected, monitored and published. This has made it difficult to assess how the regulatory burden has changed. With the limited information available, it is not clear whether compliance costs have increased or decreased overall as a result of the harmonisation reforms. Compliance costs appear to have decreased for some operators, particularly in rail.

RECOMMENDATION 7.1 – REGULATORS SHOULD REPORT ON COMPLIANCE COSTS

The National Heavy Vehicle Regulator, the Office of the National Rail Safety Regulator and the Australian Maritime Safety Authority should monitor compliance costs and report on these costs, disaggregated by key regulatory activity, commencing in 2021.

7.3 Administrative costs

The COAG reforms consolidated activities previously undertaken by State and Territory governments, offering the potential for economies of scale and a decrease in administrative costs (that is, costs incurred by regulators and governments in administering and enforcing the regulatory arrangements). This section mainly examines spending by the regulators. Costs are also incurred by other bodies in enforcing and managing the regulations (such as by road managers in delivering permit approvals under the HVNL or the police in enforcing all three regimes).

Table 7.2 presents estimates of administrative costs for heavy vehicles, rail and domestic commercial vessels, before and after the commencement of the national systems. A decrease in cost alone is not necessarily a desirable outcome if it comes with an undesirable reduction in the number or quality of services. Numerous factors affecting administrative costs should be considered.

To determine whether costs have fallen, consistent and detailed data for the periods before and after the commencement of the national systems are needed. Due to data limitations and the complexity of the various systems however, it is not possible to accurately determine whether administrative cost savings have been realised.

Service-level agreements with States and Territories still account for a significant proportion of the expenses for the NHVR and AMSA. Some state regulators incur costs exceeding service-level agreement payments by the national regulators, Australian government payments, and associated industry fees. Since 2014, local governments have incurred the additional costs of processing heavy vehicle access applications and establishing rail-road interface agreements.

Table 7.2 Spending by regulators^a

Nominal expenditure

	<i>Total expenses (pre-national systems) \$m</i>	<i>Total expenses by national regulators</i>	
		<i>2014-15 \$m</i>	<i>2018-19 \$m</i>
Heavy vehicles	218.0 ^b (2007-08)	123.5	154.3
Rail	29.0 (2008-09) 35.22 (2012-13)	30.1	37.4 ^c
Domestic commercial vessels	22.1 (2008-09)	np ^d	np ^d

np Not published. **a** Pre-national system estimates are taken from regulation impact statements and ONRSR's submission. 2014-15 and 2018-19 estimates are taken from national regulator annual reports. Care should be taken in comparing the above expenditure estimates over time and between modes due to inconsistency of data. **b** Expenditure estimates include the costs of registration services, transport of dangerous goods, licencing and WA and NT heavy vehicle regulatory activities. This in part explains the significant difference in expenditure for heavy vehicles between 2007-08, 2014-15 and 2018-19. **c** Western Australia transitioned in 2015, and Queensland in 2017. **d** AMSA does not publish expenditure separately for the regulation of domestic commercial vessels.

Sources: DITRD LG (2009); NAMSRS (2009); NHVR (2015, 2019a); NTC (2011b); ONRSR (sub. DR68, p. 2; 2015, 2019).

Given the transfer of staff and responsibilities is still occurring for heavy vehicles and domestic commercial vessels and the high transitional costs of the national systems, it is unlikely that significant savings resulting from economies of scale have been realised yet.

ONRSR stated that it made efforts to reduce its own administrative costs. In 2017-18, it reduced the costs of rail regulation by \$1 million through the identification of internal efficiencies (ONRSR, sub. 21, p. 29).

The issue of cross subsidies within regulators has been raised in submissions to the inquiry. For example, the Maritime Industry of Australia submission points to the Australian National Audit Office's conclusions that AMSA is over-recovering costs for some activities and under-recovering for others (MIAL, sub. 14, p. 3). Regulators should ensure that these cross subsidies are removed wherever practicable.

The three national transport regimes have different levels of cost recovery. Cost recovery matters are further discussed in chapter 10.

Reporting administrative costs

The three national regulators publish administrative cost information in their annual reports disaggregated by broad (financial) categories. Categories include, for example, service-level agreement payments to state regulators, employee and related expenses, supplies and services, and depreciation and amortisation.

More detailed public reporting of administrative cost information would allow for greater transparency and accountability, as supported by Arc Infrastructure (sub. 17, p. 8). It would assist stakeholders to monitor the relationship between the costs of providing regulatory services and the fees charged for those services (as discussed in the Commission’s inquiry into airport regulation (PC 2019, p. 24)). Stakeholders would also be able to raise concerns and discuss opportunities for reform with regards to regulator spending and cost recovery.

Therefore, regulators should publish their own administrative costs disaggregated by key regulatory activity. Key regulatory activities for this purpose may include, for example, accreditation, compliance monitoring, enforcement, training and education, and access management. There may be some overlap with the key regulatory activities for the purposes of compliance cost collection and reporting. For AMSA, this should also involve publishing separate expenditure information for domestic commercial vessels and *Navigation Act 2001* (Cwlth) vessels.

The Commission acknowledges that there may be challenges to disaggregating the costs of individual activities and there is likely to be no agreed methodology to allocating certain costs. Nevertheless, regulators should aim to use a methodology appropriate to the nature of their activities. Some administrative costs may not be directly attributable to a particular activity and should be reported as such.

As discussed above, some States and Territories continue to incur administrative costs associated with the regulation of heavy vehicles and domestic commercial vessels. Until these arrangements are phased out (as per recommendation 4.2), the NHVR and AMSA should continue to report the costs of the associated service-level agreements.

FINDING 7.2 – LACK OF DETAILED ADMINISTRATIVE COST INFORMATION

A time series of consistent and detailed administrative cost information on the regulation of heavy vehicles, rail and domestic commercial vessels is not available. Furthermore, the three national regulators do not report administrative cost information disaggregated by key regulatory activity. This has limited the Commission’s ability to assess whether administrative costs have fallen as a result of the national reforms. It also limits the ability of stakeholders to monitor, raise concerns and discuss opportunities for improvement with the regulators.

RECOMMENDATION 7.2 – REGULATORS SHOULD DISAGGREGATE ADMINISTRATIVE COSTS

The National Heavy Vehicle Regulator, the Office of the National Rail Safety Regulator and the Australian Maritime Safety Authority should disaggregate their administrative costs by key regulatory activity in their annual reports.

7.4 Access management of heavy vehicles

As transport operators have sought to reduce costs and increase efficiency, they have gradually moved to larger vehicles. Technological improvements have made larger vehicles safer, more efficient and less damaging for road infrastructure. Operators are also using combinations that can be broken down into smaller units, to access more densely populated areas. These vehicles offer significant productivity gains when suitable access routes are made available.

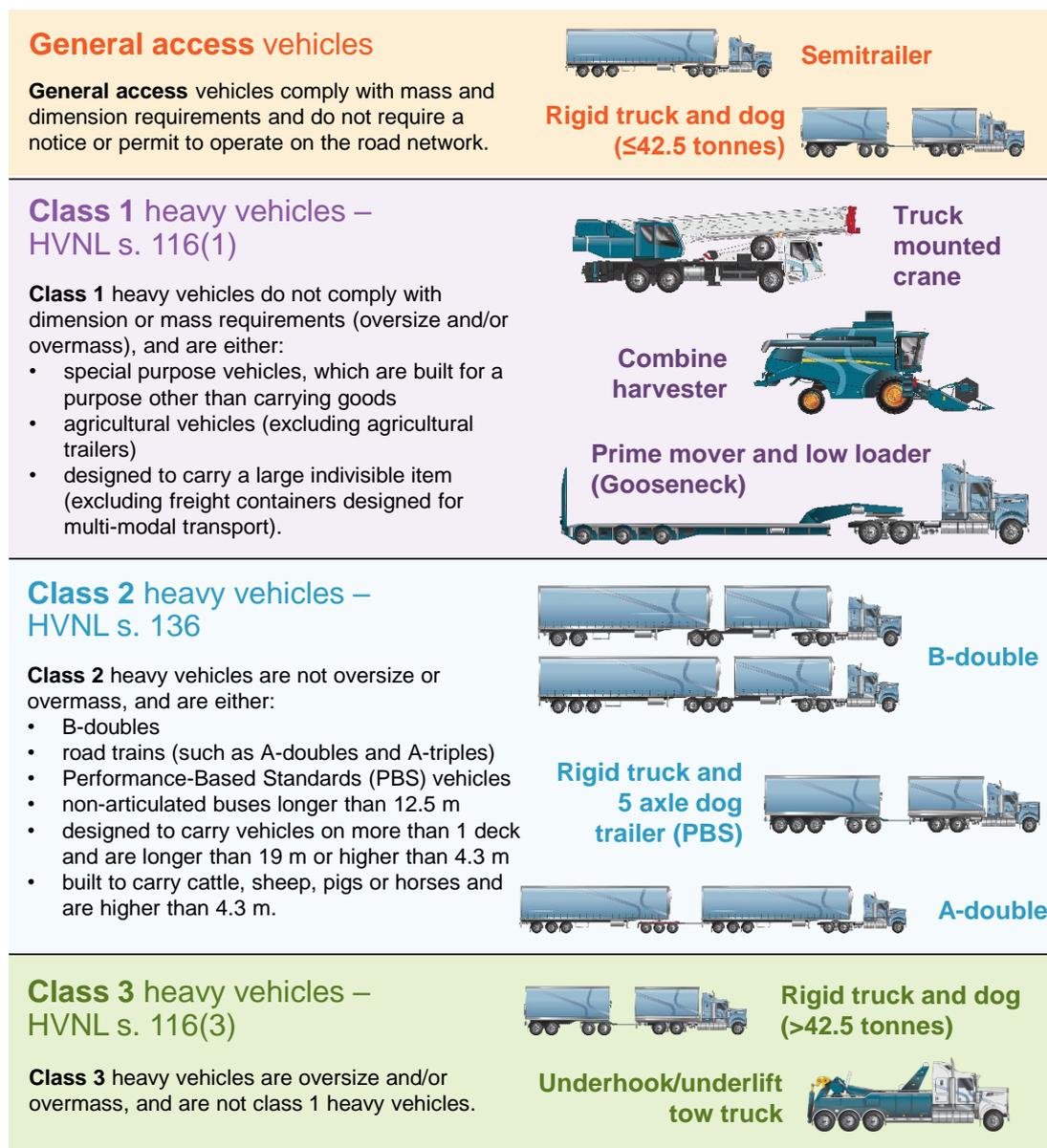
Restricted access vehicles

There are two broad types of heavy vehicles: general access and restricted access. General access heavy vehicles have access to almost the entire road network. Restricted access vehicles can only travel on a road network designated by a notice or using a permit. Access permits are issued to operators for specific vehicles and routes or geographic areas. Pre-approved permit arrangements expedite the permit-issuing process (section 7.5). Notices provide as-of-right access on gazetted routes for specified vehicles, bypassing the need to apply for permits. Notices provide greater certainty and flexibility to heavy vehicle operators (discussed below), and reduce the regulatory burden associated with operators applying for permits and road managers processing permits.

State, Territory and local government road managers are at the centre of the decision making process in relation to access for heavy vehicles. Road managers carry responsibilities for safety, amenity, investment, maintenance and access (discussed below). State and Territory governments are the road managers for highways and many key freight routes, which account for a significant proportion of tonne kilometres transported. Local governments manage local roads, which account for 75 per cent of the road network (ALGA 2019, p. IV).

The HVNL has three classes of restricted access vehicles (figure 7.2). Most freight vehicles fall within Class 2. Larger and heavier vehicles that exceed prescribed mass and dimension requirements also need approved access.

Figure 7.2 Heavy vehicles come in many shapes and sizes



Source: NHVR (2020a).

Road networks

Road networks for freight vehicles operating within the HVNL’s prescriptive requirements can broadly be categorised into four groups:

- general access, for vehicles up to 19 metres and 45.5 tonnes (including standard semitrailers)
- B-double network, for vehicles up to 26 metres and 68 tonnes

-
- type 1 road train network, for vehicles with two or three trailers and are up to 36.5 metres and 113 tonnes (including A-doubles)
 - type 2 road train network, for vehicles with three or four trailers and are up to 53.5 metres and 135.5 tonnes (including A-triples).

The effect of the COAG reforms

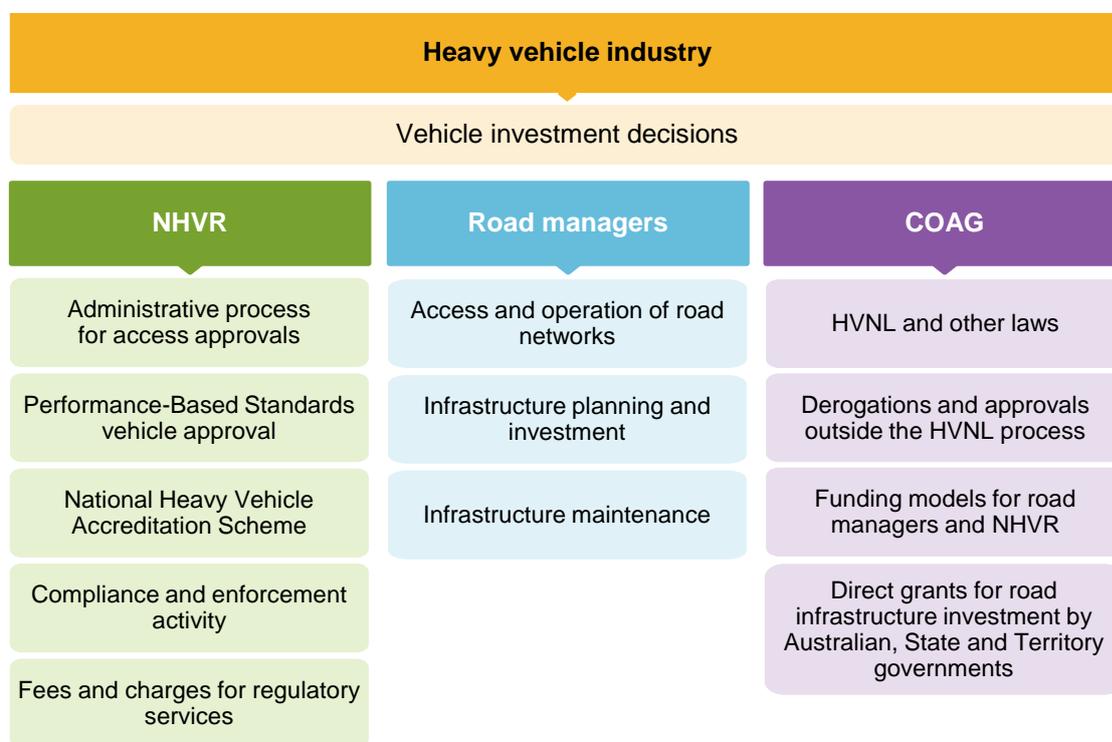
The role of the national regulator

The NHVR was established as part of the national heavy vehicle reforms. There are limits to what the NHVR alone can achieve with respect to improving the productivity of the road transport system. The NHVR first and foremost is a safety regulator. The NHVR does have a role in facilitating productivity through the administrative process for access permits and for administering schemes that allow for more flexible mass limits. However, road managers are ultimately responsible for heavy vehicle access decisions, infrastructure investment and the operation of road networks. The design of regulation by governments, and decisions by the heavy vehicle industry itself are also key drivers of heavy vehicle productivity (figure 7.3).

The NHVR acts as a one-stop shop for permit applicants. Before the reforms, permits were administered independently by each State and Territory government, with varying involvement by local governments. The reforms were intended to improve consistency in how permits are administered across States and Territories, and establish more structured, accountable and rigorous processes. Road managers must consider approved guidelines for granting access (NTC 2019a, p. 49). Pre-existing approved routes were retained when the new law commenced. The NHVR and road managers initially grappled with the challenge of making the new system work but have since made good progress (chapters 4 and 5).

The NHVR also provides support and education to industry. For example, it consolidates heavy vehicle access maps developed and published by States and Territories. These maps are presented on the NHVR's online route planner, which gives heavy vehicle operators information on which roads they have as-of-right access to and where they might require a permit for different classes of vehicles.

Figure 7.3 Many players influence heavy vehicle productivity



The NHVR is also an expert adviser to road managers. For example, it provides local governments with information about the advantages of newer truck designs and tools to assist with route assessments (NHVR 2018d, 2019f). Forums between the NHVR and local governments are held to improve access and understanding (ALGA, sub. 34, p. 11; NHVR, trans., pp. 93–94). The Australian Government *Budget 2019-20* provided \$8 million to the NHVR to fund engineering assessments for local government road infrastructure and to build an asset database (Commonwealth of Australia 2019, p. 145). The NHVR has also engaged with road managers to harmonise conditions of access across jurisdictions (NHVR 2019e) and establish pre-approved and gazetted routes.

The reforms built on existing initiatives

The COAG reforms built on the access framework for heavy vehicles developed in the late 1990s and early 2000s (box 7.1). The NHVR became responsible for administering the NHVAS, the mass management module of which provides for concessional mass limits (CML) and higher mass limits (HML). The NHVR promoted consistency in how NHVAS accreditation is obtained and the size of additional mass allowances across jurisdictions, which was expected to facilitate uptake in the scheme (Chow, Kleyer and McLeod 2019, p. 16).

Box 7.1 Heavy vehicle mass limits

General Mass Limits (GML)

Each vehicle type has a GML, indicating the allowable mass for that type of heavy vehicle unless operating under an accreditation or exemption. General mass and dimension limits for heavy vehicles have risen over time and were standardised across jurisdictions by 1995.

Concessional Mass Limits (CML)

CML under the mass management module of the National Heavy Vehicle Accreditation Scheme (NHVAS) was introduced in 2006. The scheme allows for an increase in mass of up to 5 per cent above GML. The access networks for operators granted CML are typically the same for GML vehicles.

Higher Mass Limits (HML)

The Australian Transport Council approved HML in 2008. HML applies to operators accredited under the mass management module of the NHVAS who are operating vehicles with road-friendly suspension, which have a lower impact on road pavements. HML are about 10 per cent above GML. HML vehicles in Queensland and New South Wales must also participate in the Intelligent Access Program (IAP), which uses telematics to monitor the routes the vehicles are using. Vehicles operating at HML require a permit unless they are travelling on a gazetted HML network.

Performance-Based Standards (PBS)

The PBS scheme was introduced in 2007. PBS vehicles must first be approved by the NHVR, and are assessed on outcomes-based safety and infrastructure standards. PBS vehicles may be longer or carry heavier loads, and display productivity improvements of about 10 to 40 per cent over equivalent non-PBS vehicles. They also have their own standards for GML, CML and HML. PBS vehicles are grouped into four performance levels and two sub-classes, each with their own access networks. A permit is required for a PBS vehicle to travel on or off the network unless it has been gazetted for that vehicle. Some jurisdictions require PBS vehicles to participate in the IAP as a condition of access.

Example mass and dimension limits for a 4-axle truck and 4-axle dog trailer

	<i>Length (m)</i>	<i>GML (t)</i>	<i>CML (t)</i>	<i>HML (t)</i>
Non-PBS	19	42.5	43.5	na
PBS Level 2	20	60.5	62.0	62.0

na Not available.

Sources: BITRE (2011); Hassall (2014, p. 23); NHVR (2018c, 2019f, 2020b, 2020d).

The reforms also built on the PBS scheme, which recognises technological changes that enhance heavy vehicle safety and performance by allowing higher mass and dimension limits (box 7.2). The NHVR became responsible for approving PBS vehicle designs following the regulatory reforms, again promoting consistency and encouraging uptake.

Box 7.2 PBS vehicle assessments and access to networks

PBS vehicle performance is assessed against a range of criteria to determine safety and load-carrying characteristics, outlined below. This ensures that PBS vehicles are safe and fit for use on existing road networks, while improving productivity.

Safety standards	
<p>Powertrain standards</p> <ul style="list-style-type: none"> Startability Gradeability (A, B) Acceleration capability <p>High-speed performance</p> <ul style="list-style-type: none"> Rearward amplification High-speed transient offtracking Tracking ability on a straight path Yaw damping coefficient 	<p>Low-speed performance</p> <ul style="list-style-type: none"> Frontal swing, maxima of difference, difference of maximum Tail swing Low-speed swept path Steer type friction demand <p>Vehicle stability</p> <ul style="list-style-type: none"> Static rollover threshold Directional stability under braking
Infrastructure standards	
<ul style="list-style-type: none"> Pavement horizontal loading Pavement vertical loading 	<ul style="list-style-type: none"> Bridge loading (tier 1, 2, 3) Tyre contact pressure distribution

PBS vehicles are categorised by PBS level and length to assist road managers with access decisions, as shown in the table below. PBS network levels are based on the road space required for safe vehicle operation. Structural limitations due to vehicle mass and axle loads are not part of the assessment of network levels, and road managers consider these separately.

PBS level	Overall vehicle length (m)		Equivalent prescriptive vehicle configuration and access network
	Class A	Class B	
1	L ≤ 20.0	L ≤ 20.0	19m semitrailer (general access)
2	L ≤ 26.0	26.0 < L ≤ 30.0	26m B-double
3	L ≤ 36.5	36.5 < L ≤ 42.0	36.5m type 1 road train
4	L ≤ 53.5	53.5 < L ≤ 60.0	53.5m type 2 road train

Source: NHVR (2019f).

Operators must weigh the ongoing productivity benefits of investing in a PBS vehicle against the costs. The time and costs associated with assessing and certifying a PBS vehicle design are significant, as are the initial costs of the vehicle. Similarly, there are costs associated with NHVAS accreditation, and hence operating under CML and HML arrangements. HML vehicles must have road-friendly suspension and, in some jurisdictions, also have installed telematics technology. Vehicle investment decisions are discussed further below.

Western Australia and the Northern Territory remain outside the HVNL

There are many similarities between the HVNL and regimes in Western Australia and the Northern Territory but also significant differences.

Heavy vehicle length and weight restrictions appear roughly comparable between the HVNL and the WA regime. However, one submission noted:

In collaboration with Main Roads WA and local WA Shires, Western Australia's Accredited Concessional Mass System provides for increased combination lengths (longer than East Coast combinations) and more flexible road access arrangements. (CBH, sub. 13, pp. 2–3)

Main Roads Western Australia has retained centralised control of route assessment, notified routes and permit approvals. The WA Local Government Association stated that access decisions and road management responsibility should remain together. It explained the process in which Main Roads Western Australia consults with local governments:

Local Governments are asked to undertake a preliminary assessment of the route and provide this advice to Main Roads WA, so that their resources can be efficiently deployed. However, if a Local Government is unable to undertake the preliminary assessment, but supports the proposed level of access provided it is shown to be safe, then Main Roads WA can proceed to undertake the route assessment. This support from Local Governments is not sought for single trip over-size, over-mass vehicle movements which are approved by Main Roads WA. (WA Local Government Association, sub. DR79, p. 6)

HML and PBS vehicle access is extensive although an additional permit is required to operate a NHVR-approved PBS vehicle in Western Australia. Western Australia stated it can ordinarily issue permits within 48 hours (Minister for Transport, Planning (WA), sub. 43, p. 3).

In the Northern Territory, operators need to register heavy vehicles if they are operating in the Territory for more than three months. No accreditation is required, and access is relatively broad. Operators must observe Northern Territory occupational health and safety regulations, including fatigue management. Operators have open access for road trains to all industrial areas. HML vehicles can access all of the road network unless specific restrictions apply (Northern Territory Government 2019).

Heavy vehicle access decisions by road managers

Improving heavy vehicle access is not a simple task. Road managers are responsible for the initial investment in roads, maintenance, safety and balancing the needs of residents and road users, including heavy vehicles. Road maintenance costs may be higher for heavy vehicles and additional investment, such as in pavement and bridge strengthening, may be required to allow infrastructure to handle new larger heavy vehicles (box 7.3). Road managers also need to consider reasonable community expectations, including concerns about the safety risk posed by large vehicles and increased congestion.

Additional infrastructure investment is justified when there is likely to be a strong net benefit (demonstrated through a transparent cost-benefit analysis). Positive net benefits are most likely demonstrated on routes with significant (actual or potential) freight volumes, rather than routes with a small freight load.

Box 7.3 Heavy vehicle infrastructure and safety risks

Allowing larger vehicles and broader access can affect infrastructure costs. In general, heavier vehicles cause more pavement damage but this is not a uniform outcome. If the vehicle mass is distributed over a longer combination and a greater number of axle groups, then the force applied to the road surface can be reduced. If fewer heavy vehicles are needed to accomplish the freight task this may also reduce overall damage (NHVR 2019f, p. 5). Other infrastructure risks to consider include whether vehicle mass and dimensions exceed structural limitations of bridges, the height of overhead structures and width of road corridors (NTC 2019a, p. 22).

Public safety risks are also important to manage — the dimensions of a heavy vehicle could increase the risk of a road accident. These include the risk associated with a heavy vehicle not having enough space to turn safely, and difficulties navigating or overtaking on narrow roads (NTC 2019a, p. 21).

‘First and last mile problems’ generally occur on local roads and are an ongoing challenge for operators. Expensive workarounds may be required, involving less efficient vehicles and double handling of freight, which can be especially problematic when live animal transportation is involved. Dedicated long distance carriers can also find themselves needing local road access, for example if road works require a diversion.

While opening access for larger vehicles on a particular local road may be beneficial to operators using that route, the total freight task undertaken on the route may be small, and infrastructure costs, safety risks and costs of local amenity may be disproportionately high.

Some State governments have been active proponents of greater access and have facilitated infrastructure assessments and route approvals for more productive vehicles, with some examples described in section 7.5. Australian, State and Territory governments have also issued freight plans to identify priority actions, including improving road network access (for example, NSW Government 2018; TIC 2019b; Victorian Government 2018).

Vehicle investment decisions by heavy vehicle operators

The use of larger heavy vehicles allows operators to conduct their business more productively. The heavy vehicle industry highlighted the productivity benefits of PBS vehicles in particular (for example, QTA, trans., p. 112; HVIA, trans., p. 124). The existing workhorse freight vehicle, the B-double, is less efficient and versatile than other larger combinations, such as A-doubles and B-triples (including those operating under the PBS scheme). These combinations carry more freight, meaning that fewer vehicle trips are required to complete a given freight task. As an example, the amount of freight transported in 100 vehicle movements with a 26 m B-double would only take about 80 movements with a 36.5 m A-double, reducing the amount of fuel and driver hours required (Commission estimates based on ATA (2018, p. 10)).

A-doubles are also easily separated into two standard semitrailers, increasing flexibility for operators (Dudgeon and Findlay 2016; Johnston 2019). The Queensland Trucking Association (QTA) stated that using an A-double instead of a B-double reduces the handling of freight when converting truck loads into standard 40 ft international shipping containers, as:

... a B-double is one and a half [40 ft] containers ... So you need to bring two B-doubles in with about six sets of rehandling to turn that into three containers, versus bringing one [A-double] down two [containers] at a time, two at a time. (Queensland Trucking Association, trans., p. 122)

Before investing in and operating a more productive heavy vehicle, operators must consider the significant costs involved, whether there will be sufficient access available, and whether the vehicle (if newly manufactured or imported) complies with the Australian Design Rules. QTA (trans., p. 116) stated that it could take two to three years from developing a PBS design, getting the design approved and then obtaining access approval for the vehicle. Heavy Vehicle Industry Australia (trans., p. 124) indicated that it could cost \$600 000 to \$700 000 to invest in a safer and more productive PBS vehicle, with no guarantee of access approval. Operators need confidence and consistency in the system before they invest.

Important to building confidence is certainty of access. Larger access networks, especially on key freight routes, allow operators to achieve greater vehicle utilisation by being able to pursue business across a wider geographic area and travel on more efficient routes, reducing their costs. Notices provide greater certainty to operators, which incentivises investment in and use of higher productivity vehicles. Where access is uncertain, the benefits of investing in a new vehicle can also be uncertain.

7.5 Examining changes in heavy vehicle productivity

Conceptual framework

The Commission sees productivity as being the aggregate cost efficiency of all heavy vehicle freight movements (a view which is consistent with past studies (appendix B)).

There are multiple costs associated with heavy vehicle movements. Vehicle operating costs might be reduced through:

- larger trucks — allowing larger vehicles on a given road would reduce the number of vehicle movements required
- increasing road access — allowing a given truck to travel on a more efficient route would reduce the number of kilometres travelled.

Other costs include infrastructure costs to road managers, accident costs to road users and the public, and costs to public amenity. Heavy vehicle operators also face costs in purchasing new vehicles and in getting innovative vehicle designs approved. These are not directly examined in the analysis in this section.

The Commission's approach

In practice, assessing aggregate productivity gains from the HVNL reforms to date using a cost efficiency framework is difficult for several reasons (appendix B). Accurately quantifying the change in productivity is difficult given the complexity of vehicle types, their mass allowances, road access networks and differences in their use. Even if the change could be accurately quantified, attributing this to the national reforms is an additional challenge as other factors affect productivity such as economic conditions and technological advancements, and the fact that access decisions ultimately lie with road managers rather than the NHVR. Assessing economy-wide effects is also complicated by the fact that specific reforms are likely to affect different vehicle types in different ways.

Some studies have attempted to quantify the benefits of heavy vehicle reforms on productivity (for example, Chow, Kleyer and McLeod 2019; Deloitte Access Economics 2019) (appendix B). Some estimated benefits like those predicted in the HVNL regulation impact statement. However, many of these studies use simplifying assumptions and therefore are not able to consider the complexity of the heavy vehicle fleet.

As a result of difficulties in quantitatively assessing the productivity impacts of the national reforms, the Commission has relied on partial indicators of performance, combined with qualitative evidence and case studies to provide an indication of how the national reforms may have affected productivity. Broadly, these partial indicators fall under two categories:

- factors more directly affected by the HVNL reforms (such as access arrangements and numbers of vehicles operating above general mass allowances)
- indicators that capture transport activity and performance more broadly (such as average vehicle freight loads).

The Commission used public datasets from the ABS and Department of Infrastructure, Transport, Regional Development and Communications, and unpublished datasets from the NHVR and Transport Certification Australia (TCA). These datasets provide insights into the heavy vehicle landscape, but there are limitations (appendix B). For example, TCA data only capture vehicle movements under the Intelligent Access Program (IAP). These vehicles are a subset of all heavy vehicles and the data may not be fully representative of all vehicle movements. ABS data contain limited information on vehicle types; for example, data from the ABS Survey of Motor Vehicle Use do not separate light (3.5–4.5 tonne) and heavy (over 4.5 tonne) rigid trucks.

The Commission has focused particularly on access for large freight-carrying vehicles on major freight routes, as these are likely to have a more significant impact on total productivity. The vast majority of the productivity gains from the reforms were expected to flow from freight-carrying restricted access vehicles (CIE 2011). These activities represent the largest share of the nation's freight task and productivity improvements in this area are likely to be more important from a national perspective. This is not to say that access arrangements and operating conditions for other vehicles — such as agricultural vehicles — are less important.

Who moves what where?

Australia's system of heavy vehicle movements is complex, involving different types of heavy vehicles carrying different goods and operating on different road networks.

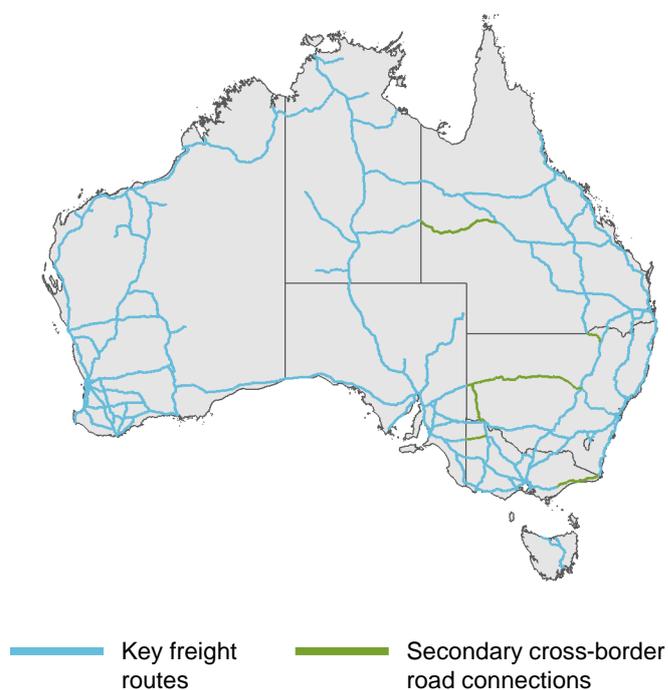
In 2018, the freight vehicle fleet included 101 000 articulated trucks and 505 000 rigid trucks (of which 69 per cent were heavy) (Commission estimates based on ABS (2018b)).⁸ Articulated vehicles carried the majority of the heavy vehicle freight task (165 billion tonne km). B-doubles accounted for about 44 per cent of this share, semitrailers 28 per cent and road trains 20 per cent (Commission estimates based on ABS (2019c)). Rigid trucks (including 3.5–4.5 tonne trucks) carried 40 billion tonne km. Articulated vehicles largely transported food and live animals, manufactured goods and crude materials. Rigid vehicles largely transported crude materials such as stone, sand and gravel (Commission estimates based on ABS (2019c)).

As mentioned above, improved access for freight-carrying vehicles on a key freight route (figure 7.4) is likely to have larger productivity gains than improved access on a local road. Heavy vehicles frequently travel on key freight routes connecting Melbourne, Sydney and Brisbane (Anderson et al. 2019). However, many freight movements occur elsewhere as well. Data for vehicles participating in the IAP (box 7.1) in 2018-19 suggest that over a quarter of the number of movements was within capital cities, nearly half was between regional locations in the same state, and the remaining quarter involved journeys between capital cities and regional areas or interstate travel (Commission estimates based on data from TCA (unpublished)). In terms of the freight task (measured by tonne kilometres), 68 per cent was for movements within the same state in 2014 (Commission estimates based on ABS (2015)).

Non-freight vehicles are also an important part of the heavy vehicle fleet. In 2018, there were about 24 000 non-freight carrying trucks (for example, fire trucks and tow trucks) and 98 000 mobile plant and equipment vehicles (for example, earthmoving machinery and cranes) — the majority of these were heavy vehicles. There were also 45 000 heavy buses (Commission estimates based on ABS (2018b)). Non-freight carrying trucks and buses (heavy and light) travelled approximately 300 million and 2300 million km that year respectively (ABS 2019c).

⁸ Numbers in this section are taken from or estimated using the ABS Survey of Motor Vehicle Use (SMVU), the ABS Motor Vehicle Census (MVC) and TCA unpublished data, depending on availability of measure, level of disaggregation and/or appropriateness.

Figure 7.4 Key freight routes^a



^a Australia's key freight routes connect nationally significant freight locations (including freight terminals, industrial, mining and agricultural precincts) and experience high heavy vehicle traffic, higher volumes of freight, or involve the transport of important commodities. Secondary freight routes provide critical linkages, but do not meet the same level of significance as key freight routes (TIC 2019a).

Source: Reproduced using data from DITRDC (2019).

What has happened to access?

As described above, heavy vehicle access is an important pathway to productivity gains. Characteristics of heavy vehicle access via permits are first described below. This is followed by an examination of access networks for key freight vehicles and other types of vehicles.

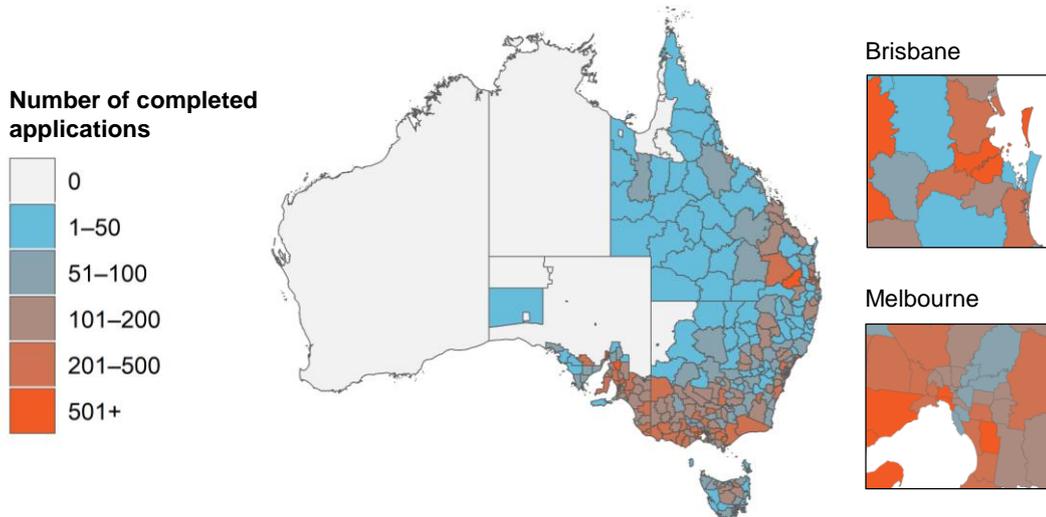
Permits and pre-approvals

Among permits submitted through the NHVR, there were 42 000 completed in 2018-19 (Commission estimates based on data from NHVR (unpublished)). This included applications for both single routes (which tend to be across State borders) and areas (defined by local government boundaries), that have been either approved or rejected.

State road managers completed the most permit applications out of all road managers. VicRoads processed 11 600, and the SA Department of Planning, Transport and Infrastructure processed nearly 9000 in 2018-19. The local governments that processed the

most permit applications through the NHVR tend to be around cities, key population centres and key freight routes (figure 7.5).

Figure 7.5 Local governments process varying numbers of permits
Number of completed permit applications by local government area (LGA), 2018-19^a



^a This figure only maps NHVR permit applications that were processed by local governments and the ACT. It excludes those processed by state road managers and other agencies (such as ports and airports). It also excludes most Class 1 permit applications in New South Wales and Queensland, which were not submitted via the NHVR.

Sources: Commission estimates based on data from NHVR (unpublished) and ABS (*Australian Statistical Geography Standard (ASGS): Volume 3 – Non ABS Structures, July 2016*, Cat. no. 1270.0.55.003).

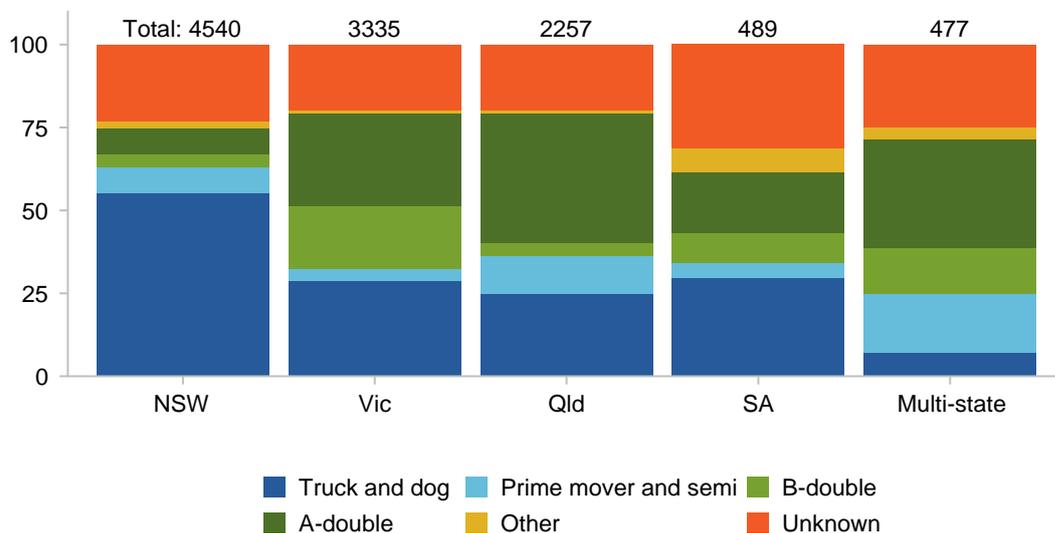
Permit access by vehicle type

The Commission's analysis shows that Oversize Overmass (OSOM) vehicles most commonly gained access via permits. About a third of applications completed via the NHVR system were for OSOM vehicles, and they had a refusal rate of only 2.1 per cent in 2018-19. They were also relatively quick for road managers to assess, with a median end-to-end processing time of seven days.

Permit applications for PBS vehicles were also relatively common, at 28 per cent of applications in 2018-19. While pre-approved permit networks for these vehicles have improved in some areas, many types of PBS vehicles are still yet to achieve wide gazetted network access (with some examples discussed further below). Rigid truck and dog combinations were most common among PBS permit applications. However, applications for larger PBS freight vehicles (such as B-doubles and A-doubles) appear to predominate in Victoria and Queensland (figure 7.6). This may be partially explained by State government initiatives targeted at access for PBS freight vehicles, described below.

Figure 7.6 Types of PBS permit applications differ across jurisdictions

Completed permit applications by PBS combination type, as a percentage of all completed PBS permit applications, by state, 2018-19^a



^a This figure excludes Tasmania and the ACT, which only had 165 and 29 PBS permit applications respectively (excluding multi-state applications). It also excludes 560 PBS permit applications where the state could not be identified.

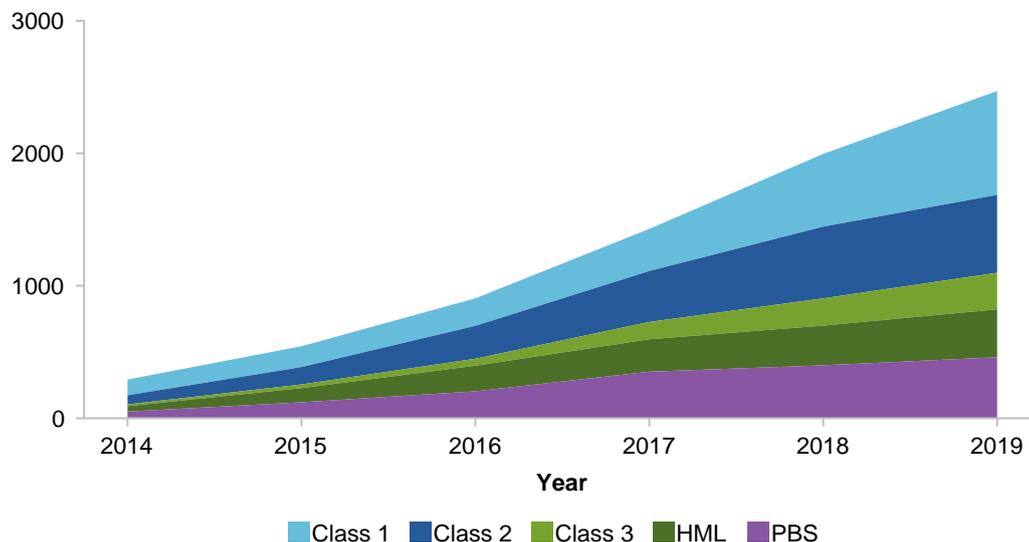
Source: Commission estimates based on data from NHVR (unpublished).

Only about a quarter of permit applications were for non-PBS freight-carrying vehicles (such as B-doubles and road trains). The smaller numbers of applications for these vehicles, compared with OSOM and PBS vehicles, could be because they already have relatively good as-of-right access on certain routes. It could also be because operators are less inclined to apply for permits for freight vehicles due to their higher refusal rates and longer processing times. Permit refusal rates for GML/CML and HML freight vehicles were 14 and 12 per cent respectively, and they took a median time of about two weeks to process. The longer processing times could be explained by some road managers having a lack of expertise or resourcing to evaluate permit applications for these types of vehicles.

Changes in permit access

Overall, access via permits appears to be improving. The introduction of the NHVR Portal in 2016 has helped to streamline the process of applying for permits. The NHVR has also encouraged state and local road managers to voluntarily pre-approve routes, across all vehicle classes (figure 7.7). This allows the NHVR to approve access immediately within the limits set by the road manager. In 2019, about 10 per cent of permit decisions were granted via pre-approval, an increase from 8 per cent in 2018 (Commission estimates based on data from NHVR (unpublished)).

Figure 7.7 The extent of pre-approved routes and areas has grown
 Number of pre-approved routes or areas, by permit class, 2014 to 2019^{a,b}



^a The number of pre-approved routes or areas in 2019 is at September 2019. ^b Data may include some routes or areas that have since been gazetted.

Source: Commission estimates based on data from NHVR (unpublished).

Certainty and timeliness of access are important to heavy vehicle operators for conducting their business. The increase in pre-approvals and other initiatives the NHVR has undertaken to help expedite requests has likely contributed to the reduction in processing times from an average of about 34 days to 19 days between 2016-17 and 2018-19 (NHVR 2019a, p. 64). This included about 5 days of NHVR processing time on average. Permit refusal rates have also fallen in general, from 16 per cent to about 6 per cent over the same period (Commission estimates based on data from NHVR (unpublished)). This could be due in part to the NHVR’s efforts to educate road managers about the road impacts of certain vehicles, and developing solutions that do not involve the refusal of a permit.

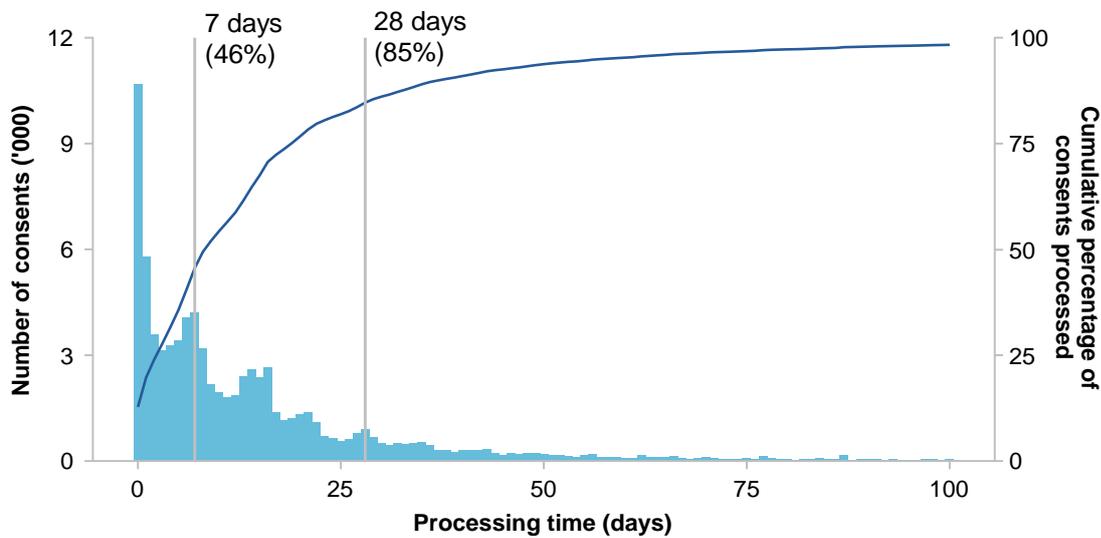
Despite some progress, there is scope for further improvement. Nearly half of permit decisions were made within 7 days in 2018-19, but some take much longer, and some exceed the 28-day timeframe provided in the HVNL (figure 7.8). The National Transport Commission (NTC) (2019a, pp. 40–42) found that local governments receiving large numbers of permit applications were more efficient at processing them, but did not find an obvious relationship between the size (and resources) of the jurisdiction and processing times. The National Road Transport Association (sub. DR82, p. 2) provided evidence that hold ups can also occur due to internal delays in the NHVR’s administration of the permit system.

Some local road managers appear to have refused freight or PBS vehicle applications at a higher rate than other road managers. There could be location-specific reasons for this (for example, bridge capacity limitations), and road infrastructure was the most commonly stated

reason for refusal (at 70 per cent). However, some refusals may have been due to inconsistent use of guidelines for granting access (discussed further below). Furthermore, road managers do not always provide substantial evidence of their reasons for refusal (NTC 2019a, p. 49).

Further details of the analysis of access permits are covered in appendix B.

Figure 7.8 Nearly half of all permit decisions were made within 7 days
Permit processing times, completed permit applications in 2018-19^a



^a Time taken from the date the application was submitted in the NHVR Portal to the date the road manager provided a decision (including NHVR and road manager processing times). A 'consent' is a road manager decision. 1401 consents took over 100 days to process and are not pictured in the chart. The chart also excludes most Class 1 permit applications in New South Wales and Queensland, which were not submitted via the NHVR.

Source: Commission estimates based on data from NHVR (unpublished).

Access networks for key freight vehicles

Freight vehicles such as B-doubles and road trains account for the majority of the total tonne kilometres of transport in Australia by restricted access vehicles. As such, access decisions for these vehicles are vital to the overall productivity of the heavy vehicle sector.

To assess changes in road access for these vehicles, the historical change in the gazetted network was examined using data from NHVR over the period 2014–2019. The analysis is indicative of expanded access across most vehicle types, albeit with expansions primarily occurring on local roads in regional areas (appendix B). However, it has not been possible to assess and verify access changes occurring across all vehicle types and jurisdictions.

Key national notices for B-doubles and road trains were issued in recent years, which have led to some expansions in network access, mainly on local roads, and greater consistency in access conditions across States and Territories (box 7.4). Despite efforts by the NHVR to harmonise and improve the access networks for road trains (notably A-doubles), consistency and access remains constrained relative to B-doubles, particularly on major freight routes (figure 7.9).

Box 7.4 B-double and road train access changes

National Class 2 B-double Authorisation Notice (2019)

In 2019, the NHVR issued the National B-double Authorisation Notice following consultation with State and Territory governments and a review of existing B-double network access and operating conditions. The notice was intended to address inconsistent access conditions and align B-double standards across States and Territories.

Some restricted access B-double networks expanded after the national notice, for example routes for 25/26 m B-doubles in regional New South Wales. This has probably produced only a small productivity benefit. Comparisons of 2018 and 2019 25/26 m B-double road networks indicate that the new routes were primarily opened up on local roads and were not part of Australia's key freight routes (appendix B). Moreover, telematics data provided by TCA suggest low use by B-doubles, with most of the new routes used fewer than 50 times in 2018-19 by vehicles participating in the Intelligent Access Program.

On the other hand, efforts to harmonise the system across States and Territories through a single B-double notice may have delivered significant productivity benefits. For example, changes included an increased mass allowance of 7.5 tonnes for 19 m B-doubles operating in South Australia, a general access network across the ACT and bridge formulae for all general access B-doubles (NHVR 2019b).

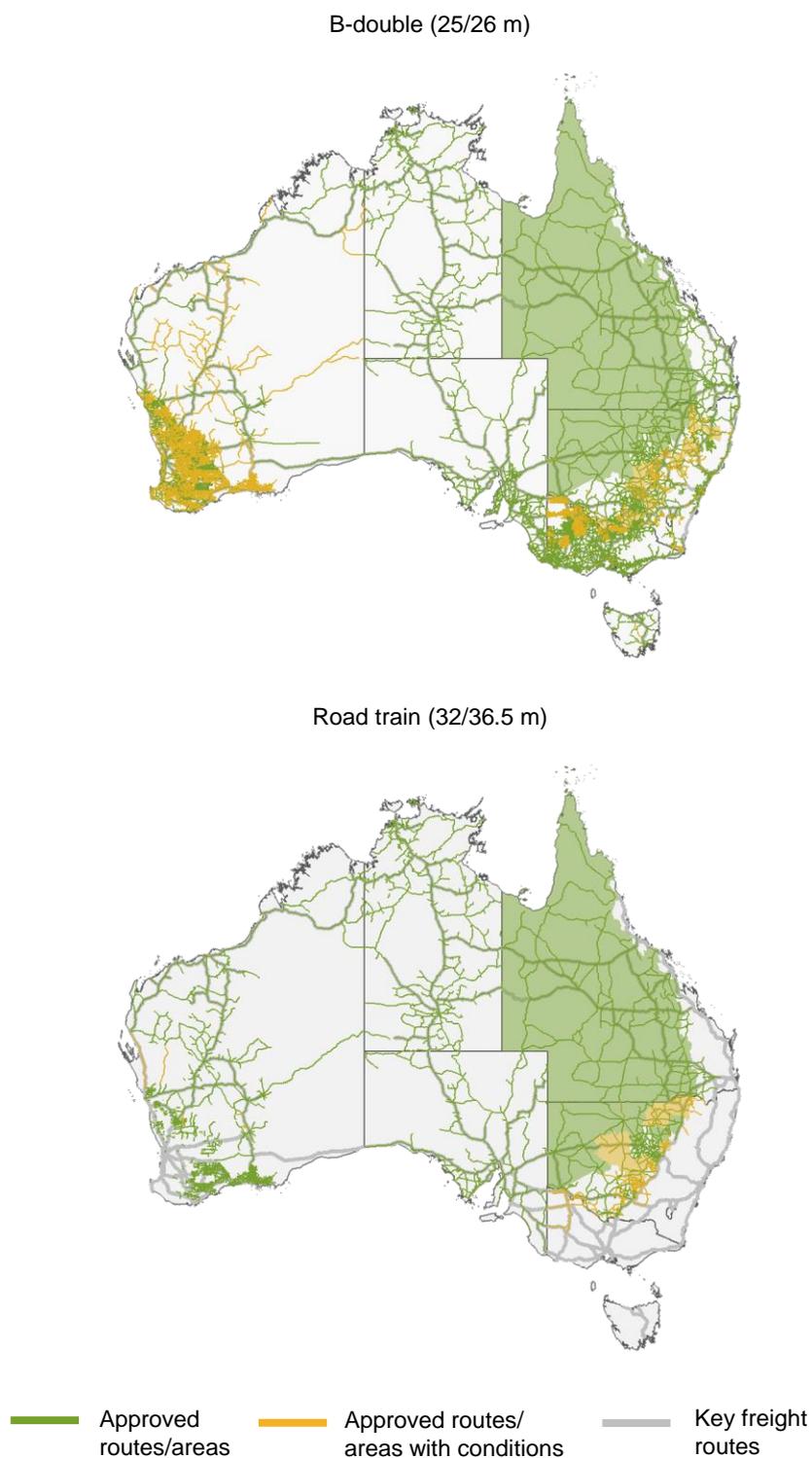
National Class 2 Heavy Vehicle Road Train Authorisation Notice (2015)

The National Road Train Authorisation Notice authorised the use of road trains in stated areas or on stated routes, and clarified the conditions under which road trains may be used. Comparisons of the 2014 and 2019 road networks show that while overall the expansion in access was small as a proportion of the existing network, as-of-right access opened up on several important freight routes (appendix B).

In the case of New South Wales, collaboration between Transport for New South Wales and the NHVR led to an important segment of the Newell highway — a key link for freight transport between Victoria, Queensland and regional centres in western New South Wales — being gazetted for A-doubles operating at general and concessional mass limits (NSW RMS 2016). After the 2015 national notice, a number of additional routes have been added to the road train network, including further segments of the Newell highway (NSW RMS 2019). While this represents a positive step towards achieving end-to-end access for type 1 road trains on the Newell, a break in the route remains from Forbes to Parkes. As such this change is unlikely to have substantially incentivised increased uptake of A-doubles or led to a substantial productivity benefit. Other additions to the road train network included the Sturt, Olympic, Kamilaroi and Gwydir highways in central New South Wales.

The NHVR is continuing to prioritise improving network access and operating conditions for road trains as part of its national harmonisation program (NHVR 2019d).

Figure 7.9 B-double versus road train access^a



^a Access restrictions not shown. Key freight routes include both primary freight routes and secondary cross-border road connections. For updated road access networks, see State and Territory road authority websites.

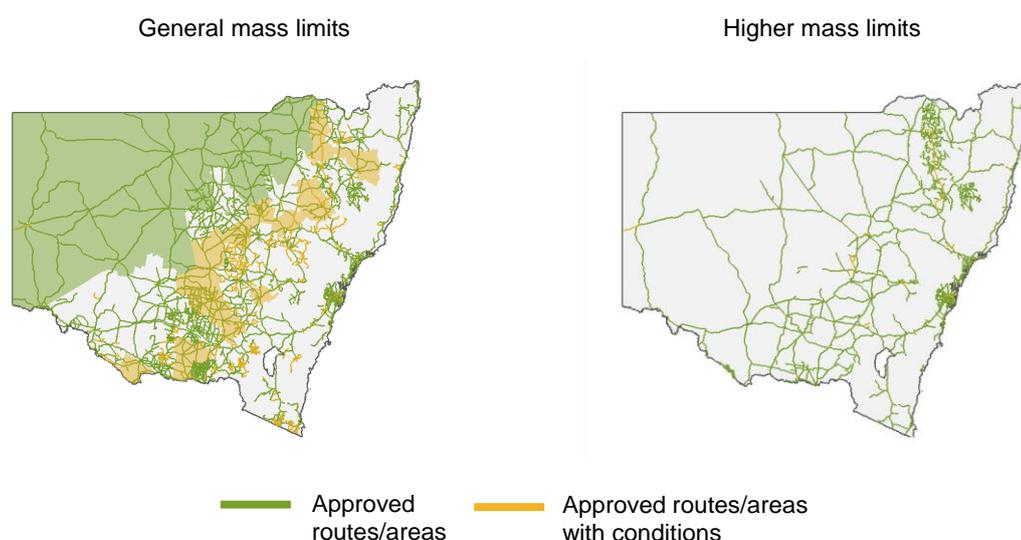
Sources: Reproduced using data from DITRDC (2019) and NHVR (unpublished).

The NHVR is reviewing and redesigning the existing National Class 2 Heavy Vehicle Road Train Authorisation Notice (2015) (NHVR 2019d). This review aims to create a nationally harmonised notice by producing standard definitions and categorisations of road train configurations, and further improve the consistency of access and vehicle conditions. Important draft conditions include: consistent national definitions for road train combinations, consolidated road access networks that align with PBS networks, flexibility around warning sign requirements and the removal of suspension requirements for A-doubles operating at GML.

Access for HML and PBS freight vehicles

Like road trains, access for B-doubles operating at HML remains constrained relative to B-doubles operating at GML (figure 7.10). Comparisons of 2016 and 2019 road access networks show that there has been little improvement in access for HML B-doubles in recent years (appendix B). This suggests there is further to go in gaining access for HML vehicles.

Figure 7.10 B-double access in New South Wales — GML versus HML^a



^a Access restrictions not shown. For updated road access networks, see Transport for NSW website.
 Source: Reproduced using data from NHVR (unpublished).

PBS vehicle access has reached significant levels on major roads. Comparisons of 2015 and 2019 networks for PBS level 2A vehicles (equivalent in operating condition to a 25/26 m B-double) in New South Wales and Victoria show substantial growth, including access on several key freight routes (appendix B). Access for PBS A-doubles in Victoria (box 7.5) and Queensland (box 7.6) provide examples of further improvements. While the Victorian example required initial large investments in infrastructure to accommodate PBS A-doubles, expanded access in the Queensland example was approved based on an assessment

of the route only. This suggests that there is scope for road managers to improve access by simply taking steps to better understand the capacity of their existing road infrastructure.

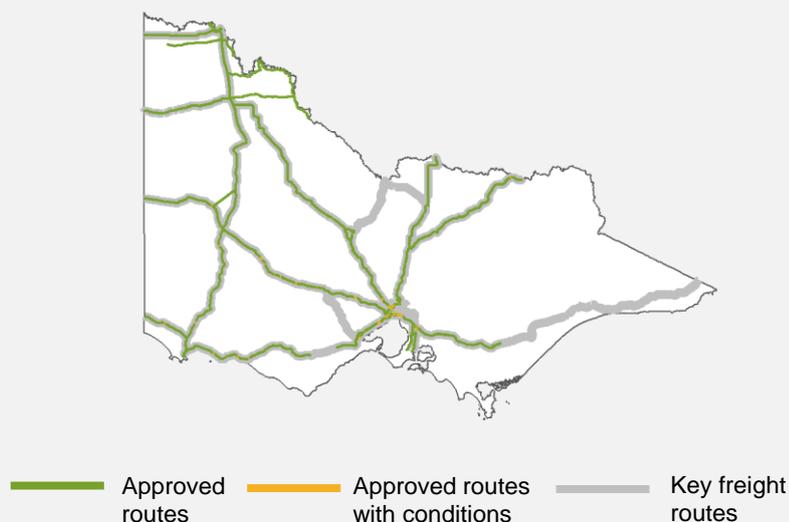
Box 7.5 PBS A-double access in Victoria

In 2018, Victoria introduced new, pre-approved, High Productivity Freight Vehicle (HPFV) road access networks to accommodate 30 m PBS A-double combinations. The change in the road access network stemmed from the Victorian Government’s commitment to improve the efficiency of its transport system and frustration within industry regarding HPFV access (Advantia 2017; Victorian Government 2018). The Victorian Government conducted a feasibility study in 2013 that identified the required infrastructure upgrades to safely facilitate access — this included the strengthening of various bridges on Victoria’s key freight routes and improvements in rest areas to facilitate longer vehicle combinations (Advantia 2018; Victorian Government 2018).

VicRoads forecasts that between now and 2030, HPFVs operating under the PBS scheme — including combinations other than A-doubles — will lead to a reduction of 4.5 billion vehicle kilometres and about 100 fatal crashes nationally (VicRoads 2017). The change to the HPFV network in Victoria highlights the important role of infrastructure managers in facilitating changes to heavy vehicle access on road networks.

Data indicate that PBS approvals for A-doubles in Victoria have continually increased, although this may be attributable to other factors in addition to the recent change in access networks. Permits for PBS A-doubles are also relatively common in Victoria (Commission estimates based on data from NHVR (unpublished)). Furthermore, telematics data from the Intelligent Access Program suggest that there is increased utilisation of the routes opened up to these vehicles. For example, in 2018-19, Type 1 road trains (including A-doubles) have accessed the Westgate Freeway — a key freight route, previously inaccessible to A-doubles — over 113 000 times (Commission estimates based on data from TCA (unpublished)).

PBS certified 30-metre A-doubles have access to most key freight routes in Victoria



Sources: Map reproduced using data from DITRDC (2019) and NHVR (unpublished). For updated road access networks, see VicRoads website.

Box 7.6 PBS A-double access from Toowoomba to Port of Brisbane

Toowoomba is a key part of the freight network, particularly for grain exports. Almost half of all exports through the Port of Brisbane pass through Toowoomba (QLD TMR 2019a).

Following assessments of the suitability of the route from Toowoomba to the Port of Brisbane for PBS A-doubles, the Queensland Government, NHVR and the Queensland Trucking Association collaborated to gazette the route in October 2018 (NHVR 2018b; Queensland DTMR 2018). This removed the need for permits on the route for 30 m PBS A-doubles operating at GML and CML.

One transport operator stated that the PBS A-double notice halved their number of trips from Toowoomba to the Port of Brisbane, compared with the single trailer combination they were previously using. They also saved almost 40 per cent in fuel use (NTC 2019a, p. 70).

Improved access may partially explain the popularity of PBS A-doubles in Queensland. A-doubles comprise about a quarter of all PBS vehicle combinations in Queensland, and at least 40 per cent of PBS permit applications completed in 2018-19 (Commission estimates based on data from NHVR (unpublished)). Further data on vehicle journeys show that the Warrego Highway in Toowoomba was used by over 23 000 type 1 road trains (including A-doubles) at least 72 000 times in total in 2018-19 (Commission estimates based on data from TCA (unpublished)).

The Queensland Government has continued to improve road infrastructure and balance community safety and amenity around Toowoomba. The opening of the new Toowoomba Bypass in September 2019 is expected to help divert heavy vehicle traffic from Toowoomba's CBD and suburban streets (QLD TMR 2019a, 2019b).

Gazetting access for PBS A-doubles operating at HML would unlock further efficiency gains along the Toowoomba to Port of Brisbane route. For this to occur, investment is required to improve the capacity of the Warrego Highway-Bremer River crossing (QTA, trans., p. 118).

Analysis of changes in network access for other key freight vehicles (such as B-triples) in certain jurisdictions is also indicative of modest access improvements.

A priority objective for road managers should be to further analyse the capacity of key freight routes for high productivity vehicles and expand access where feasible. Allowing access for higher productivity vehicles (particularly PBS vehicles) can result in fewer vehicle movements, reducing the associated operating costs and safety risks. As an example, the Hume Highway is a key freight route between Melbourne and Sydney but has limited access for A-doubles and other larger vehicles. Hassall (2014) previously estimated that opening up the Hume Highway to PBS vehicles would lead to substantial net benefits. Access on the Hume Highway has since opened up to PBS A-doubles in Victoria (box 7.5). However, this network does not extend to New South Wales, and access for A-doubles and other larger vehicles on this route remains limited, both in Victoria and New South Wales. The lack of end-to-end access for larger vehicles on the Hume Highway lowers the incentive for operators who run along this route to invest in these vehicles.

Access networks for other vehicles

‘Other vehicles’ include non-freight carrying vehicles (such as OSOM and special purpose vehicles (SPV)), and rigid truck and dog combinations. While less important from an economy-wide productivity perspective relative to freight vehicles, access decisions for non-freight carrying heavy vehicles have substantial consequences on the efficient operation of heavy vehicle movements across a range of industries, such as in construction and agriculture. Rigid truck and dog combinations are used for freight transport but carry less of the freight task than articulated vehicles.

Improving access for these other vehicles has been a priority issue for both the NHVR and State and Territory governments. Since the regulator’s inception in 2014, there have been some national notices created with the aim of improving access and operating conditions of these vehicles (box 7.7). Of particular importance was the release of the 2016 National Class 2 PBS level 1 and 2A Truck and Dog Trailer Authorisation Notice (box 7.8).

Box 7.7 A sample of national notices affecting OSOM and SPV

National Class 1 Agricultural Vehicle and Combination Mass and Dimension Exemption Notice (2019)

The notice harmonises dimension limits and standard operating conditions for agriculture vehicles and combinations such as cane trailers, silage trailers, harvesters and tractors. The notice, used in conjunction with a NHVR-published Operator’s Guide and the Agricultural Heavy Vehicle Map, has reduced and clarified the number of designated agricultural zones and reduced the complexity of cross-border movements.

National Class 1 Special Purpose Vehicle Notice (2016)

This notice authorises the use of Class 1 special purpose vehicles up to 40 tonnes on gazetted networks. Examples of vehicles operating under this notice include mobile cranes (for example, 2-axle pick and carry cranes, 2- and 3-axle all terrain mobile cranes, and 3- and 4-axle truck cranes) and mobile concrete pumps. Since its release, the NHVR has been working closely with local governments and industry to improve access for smaller special purpose vehicles. This included reviewing the existing notice and providing training to road managers to further expand access.

Gains in access are also evident from a state-level perspective. Since the introduction of the HVNL, the Tasmanian Government has collaborated with local governments, the heavy vehicle industry and the NHVR to inform access decisions for class 1 heavy vehicles. This process, which involved a state-wide assessment of road and bridge assets, led to the creation of vast gazetted road access networks for OSOM and other SPVs such as cranes, concrete pumps and drill rigs. The Tasmanian Government estimated that gazetted networks now cover approximately 80 per cent of OSOM and 95 per cent of SPV heavy vehicle movements (pers. comm., 20 January 2020). The role of road managers in improving heavy vehicle access is discussed further in chapter 10.

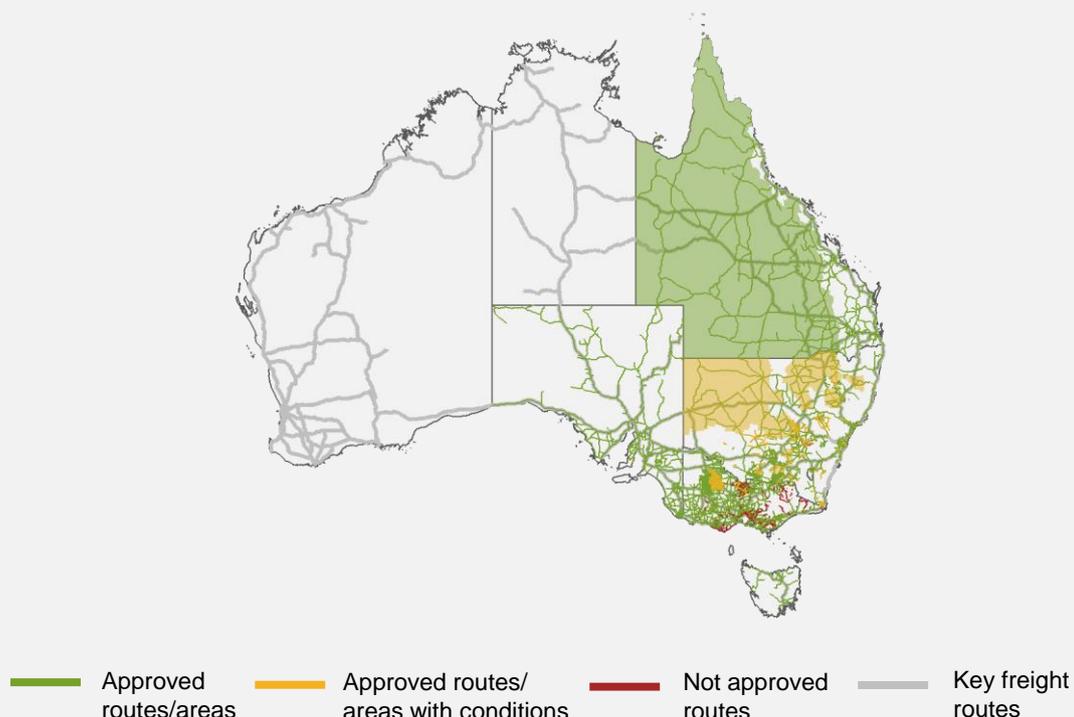
Box 7.8 National PBS truck and dog combination notice

In 2016, the National Heavy Vehicle Regulator released a notice in consultation with State and local governments to allow Performance-Based Standard (PBS) truck and dog combinations to operate without a road access permit on designated road networks. The notice covers PBS combinations consisting of a 3- to 4-axle truck towing a 3- to 5-axle dog trailer operating on the PBS level 1, PBS level 2A, and HML networks. Vehicles operating on the PBS level 2A network (pictured below) have a maximum length of 26 m, and have road network access roughly equivalent to the 25/26 m B-double network. Comparisons of 2014 and 2019 road access networks for PBS level 2A vehicles suggest a substantial expansion in access (appendix B).

The vast majority of PBS truck and dog combinations are used to carry quarry and bulk for the construction industry. A clear benefit of PBS truck and dogs is that they can carry considerably heavier mass. For example a PBS 4-axle truck and 5-axle dog trailer can carry 64 tonnes, about 1.5 times more than the largest non-PBS truck and dog.

Although the notice removed the need for permits on PBS networks, data indicate that the number of completed permit applications relating to PBS truck and dog access on other routes (typically shorter distances) has continued to increase, from at least 1000 in 2016-17 to over 4300 in 2018-19. This increase likely reflects the rise in the number of PBS truck and dog combinations, which is expected to have been partly due to better overall access. PBS truck and dog combination numbers have continually increased since 2016, and there are now more than 5000 in Australia.

PBS level 2A network



Sources: NHVR (2016a, 2016b); map reproduced using data from DITRDC (2019) and NHVR (unpublished).

Summing up changes in access

Heavy vehicle access has improved, both through increased certainty and timeliness of access via permits, and through expanded access networks. However, some road managers take a long time to assess permits, and some refuse permits at a higher rate than others, when the reasons for refusal might not be clear. Further, while access networks have expanded for most vehicles since 2014, expansions have been relatively modest and have primarily occurred on local roads in regional areas. There have been few changes in access on key freight routes for key freight vehicles, and permit applications for these vehicles tend to take longer to process and are more likely to be refused. Overall, these changes in access are substantially less than envisaged and are unlikely to have led to large economy-wide productivity benefits.

Growth in the number of CML, HML and PBS vehicles

Improvements in the consistency of administration of the NHVAS mass management module and PBS schemes, as well as some improvements in access for vehicles operating under these schemes, may have incentivised heavy vehicle operators to participate. The use of higher mass vehicles under these schemes is likely to lead to productivity improvements because fewer vehicle trips would be needed to transport the same amount of freight (subject to other considerations such as infrastructure costs). A switch to certain types of heavy vehicles could also result in better utilisation of truck combinations.

The number of operators and vehicles accredited under the mass management module of the NHVAS gives an indication of CML and HML vehicle numbers. In 2014-15, just under 4700 operators and 31 000 vehicles were accredited. By 2018-19, this had grown to over 6000 operators and 41 900 vehicles (NHVR 2019a, p. 65), representing a 35 per cent increase in vehicle numbers. These figures are indicative only and do not necessarily mean that all these vehicles operate with heavier loads.

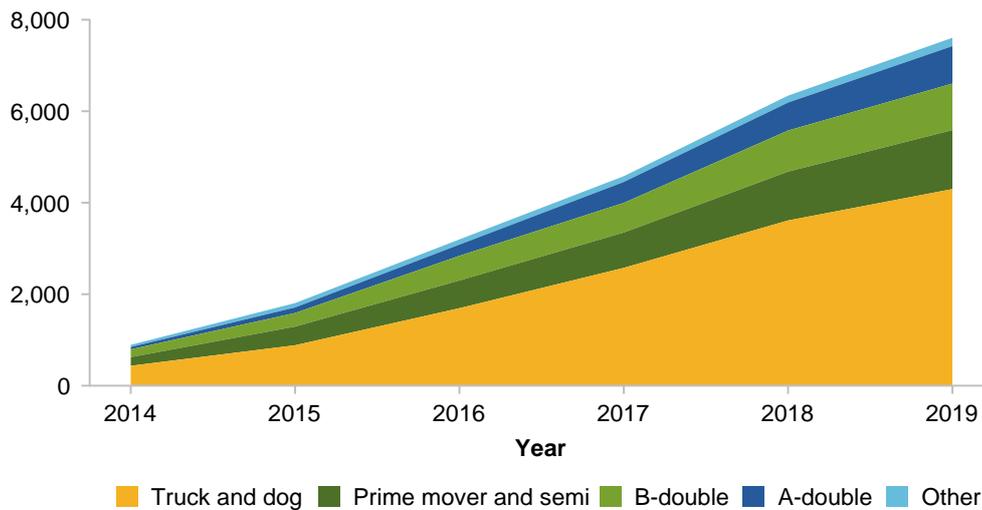
NHVR data on PBS vehicle numbers also show an increase. Between 2013 and 2019, the cumulative number of PBS vehicle combinations approved rose from about 1700 to over 9500 (NHVR (unpublished)). About half of PBS vehicle approvals are truck and dog combinations, heavily used to transport quarry and bulk (figure 7.11). The release of the national PBS truck and dog notice is likely to have contributed to their popularity (box 7.8). PBS A-doubles, B-doubles and semitrailers account for most of the remaining PBS approvals.

IAP data collected by TCA provide some additional insight into the numbers of vehicles that may be operating under HML or PBS schemes. HML vehicles operating in New South Wales and Queensland are required to participate in the IAP, as are PBS vehicles in some jurisdictions and some vehicles operating under a permit (box 7.1). In June 2015 just over 3300 vehicles were monitored through the IAP compared with over 5600 vehicles by July 2019 (TCA 2015, 2019). Additional analysis of IAP data for PBS vehicles shows that there are a significant number of movements across parts of Australia, with some routes achieving more than 10 000 movements in 2018 (ARTSA and TCA 2018).

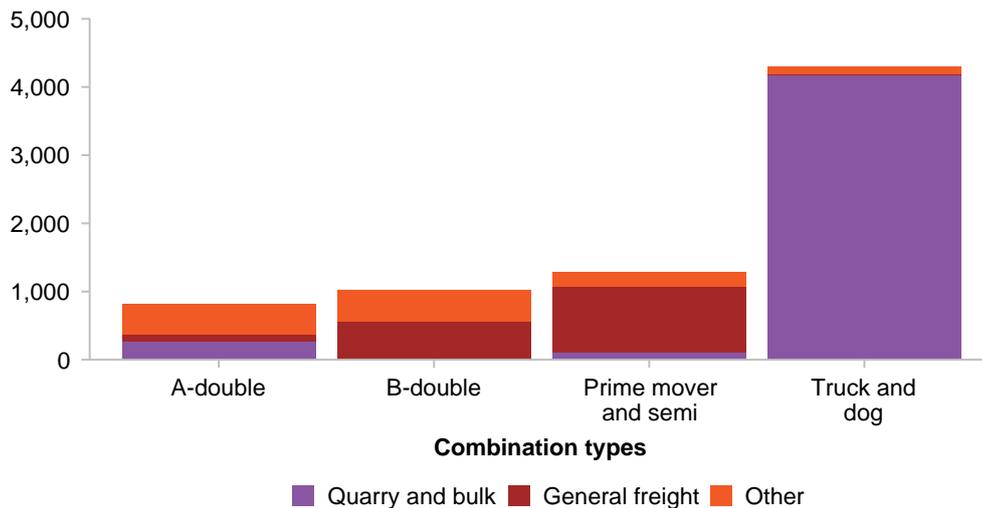
While there appears to have been significant growth in CML, HML and PBS vehicle numbers, these numbers remain small relative to the full heavy vehicle fleet, which consists of hundreds of thousands of heavy vehicles.

Figure 7.11 PBS approved vehicle combinations, by combination type^{a,b}

Number of new PBS combinations approved (cumulative), 2014 to 2019



Number of new PBS combination types approved from 2014 to 2019, by load carried



^a 'Other' (combination types) includes 'A-triple', 'B-triple', 'AB-triple', 'BA-triple', 'B-quad', 'AB-double', 'Buses' and 'Truck and pig'. These combination types are excluded in the bottom chart due to their relatively small numbers. ^b 2019 data include approvals up until September 2019.

Source: Commission estimates based on data from NHVR (unpublished).

Other indicators of heavy vehicle performance

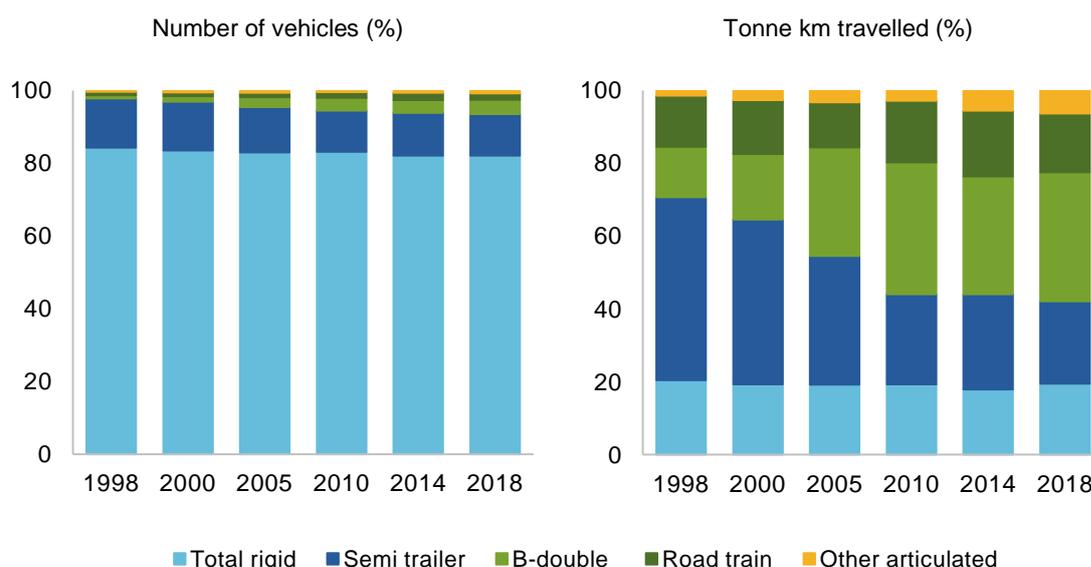
Composition of the heavy vehicle fleet

The composition of the freight-carrying heavy vehicle fleet, by broad truck categories, is relatively unchanged between 2010 and 2018, in terms of the number of vehicles and tonne kilometres travelled (figure 7.12). In other words, businesses have not significantly changed the types of heavy vehicles they are operating since the commencement of the national heavy vehicle reforms, at least within these categories of vehicles.

B-doubles remain the workhorses of the fleet. While they make up a very small portion of the fleet, they do a large portion of the tonne kilometres. The use of B-doubles increased significantly between 1998 and 2010, replacing semitrailers.

Figure 7.12 **Composition of the heavy vehicle fleet relatively unchanged between 2010 and 2018^{a,b,c}**

(LHS) Number of heavy vehicles by truck type, as a percentage of total
(RHS) Tonne kilometres travelled by truck type, as a percentage of total



^a 'Number of trucks' is the number of freight-carrying trucks operating in the given years. It excludes vehicles not reported to be travelling tonne kilometres over the period. ^b 'Total rigid' includes both light and heavy rigid trucks. These cannot be clearly separated given available data. ^c The ABS Survey of Motor Vehicle Use was designed to produce reliable estimates for a point in time only. The ABS suggests that care be taken in drawing inferences over time due to high sampling error.

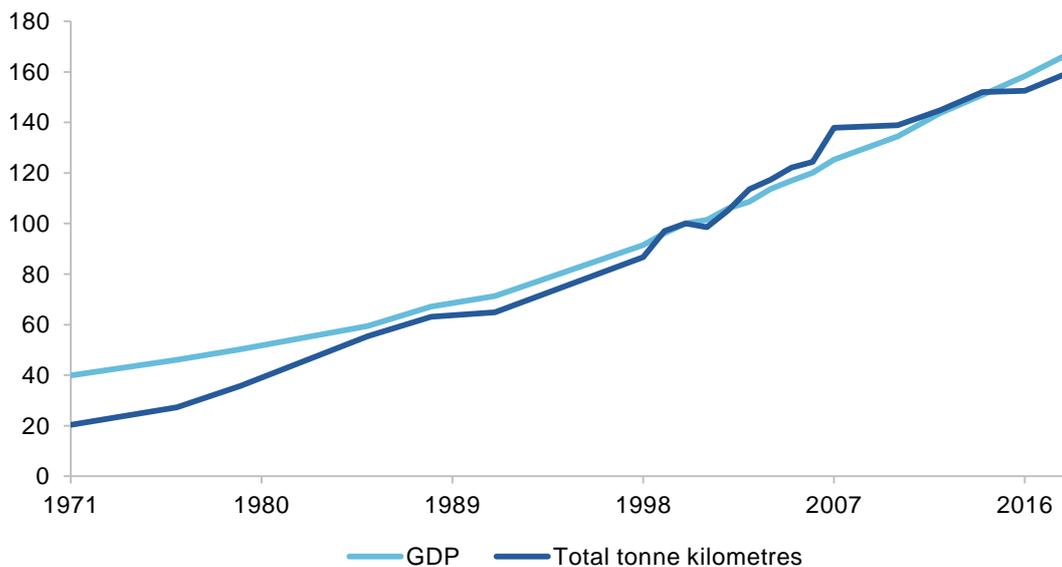
Sources: Commission estimates based on ABS (*Survey of Motor Vehicle Use, Australia, 12 months ended 30 June 2018*, Cat. No. 9208.0, tables 28 and 29) and past releases.

Trends in national indicators of heavy vehicle performance

The size of the heavy vehicle freight task (tonne kilometres travelled) is increasing broadly in line with the Australian economy since the mid-1980s (figure 7.13).

Figure 7.13 The freight task is growing in line with the economy

GDP and heavy vehicle tonne km travelled^{a,b}, 1971 to 2018, indexed, base year = 2000



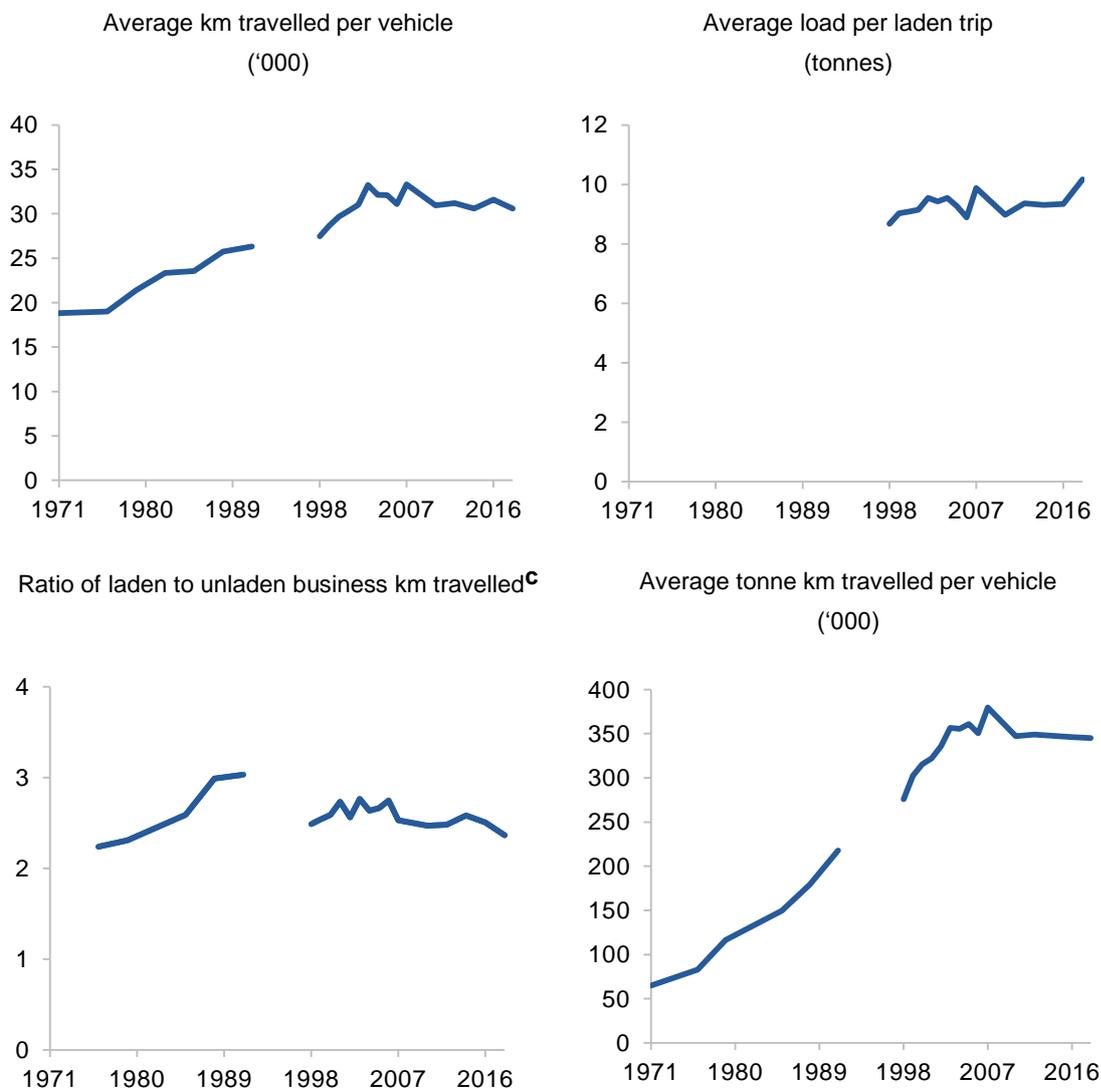
^a Data on tonne kilometres include light rigid trucks (3.5–4.5 tonne gross vehicle mass (GVM)), as light and heavy rigid trucks cannot be clearly separated in the data. ^b Data on tonne kilometres were drawn from the ABS Survey of Motor Vehicle Use, which was designed to produce reliable estimates for a point in time only. The ABS suggests that care be taken in drawing inferences over time due to high sampling error. Furthermore, changes in survey methods were introduced in 1998 to reduce recall bias.

Sources: Commission estimates based on ABS (*Australian National Accounts: National Income, Expenditure and Product, Sep 2019*, Cat. no. 5206.0, table 1) and on ABS (*Survey of Motor Vehicle Use, Australia, 12 months ended 30 June 2018*, Cat. No. 9208.0, table 2) and past releases.

There have been changes to how efficiently the freight task is being undertaken over time. A plateauing trend can be observed in recent decades for several indicators of heavy vehicle performance (figure 7.14).

Key changes to the heavy vehicle regulatory environment and industry in the 1970s to 1990s may have led to increasing heavy vehicle performance over this period. Examples include progressive increases in mass, dimension and speed limits, growth in long-distance freight and improved road infrastructure. Semitrailers and then B-doubles were increasingly used by operators. The rail industry was also deregulated, allowing certain general freight and commodities to begin being transported by heavy vehicles.

Figure 7.14 Heavy vehicle performance has plateaued over the past two decades^{a,b}
1971 to 2018



^a Data include light rigid trucks (3.5–4.5 tonne GVM), as light and heavy rigid trucks cannot be clearly separated in the data. ^b The ABS Survey of Motor Vehicle Use was designed to produce reliable estimates for a point in time only. The ABS suggests that care be taken in drawing inferences over time due to high sampling error. Furthermore changes in survey methods were introduced in 1998 to reduce recall bias. Thus, there is a break in the charts between 1991 and 1998. ^c Business kilometres travelled are for business, professional, farm or government purposes and exclude travel to and from work.

Sources: Commission estimates based on ABS (*Survey of Motor Vehicle Use, Australia, 12 months ended 30 June 2018*, Cat. No. 9208.0, tables 1 and 2) and past releases.

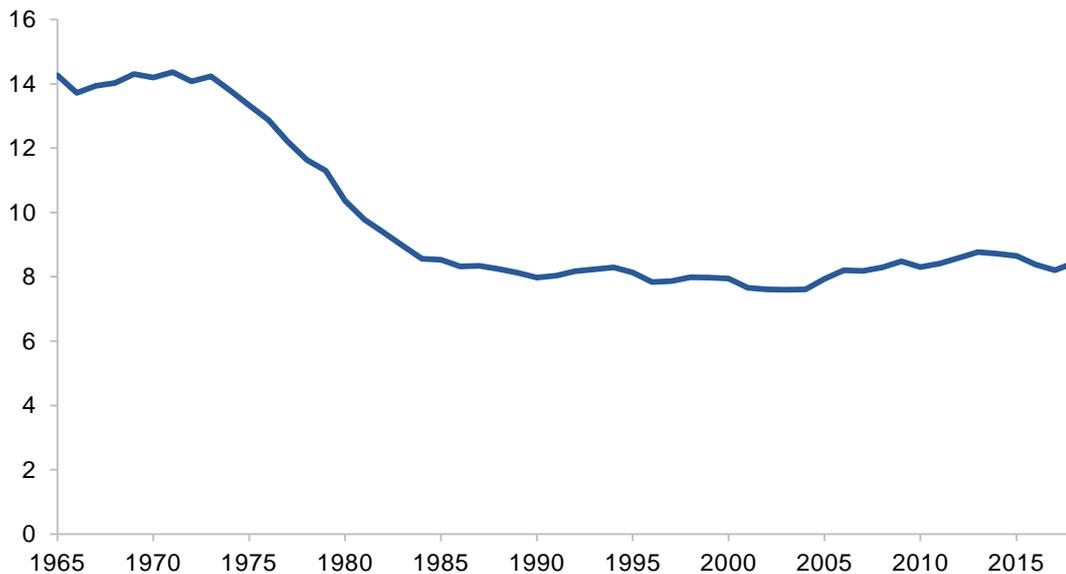
Since about 2005, the trends in average distances, loads and tonne kilometres per heavy vehicle have levelled out. The plateauing of average kilometres travelled per vehicle may be due to the changing nature of the freight task, requiring shorter and fewer trips. It could also be in part due to increased access, which would allow trips to be completed using more

efficient routes. When loaded, vehicles were carrying slightly heavier loads per trip in 2018 than they were in 1998. This may imply that there has been an increase in the uptake of larger heavy vehicles. However, the slight fall in the ratio of laden to unladen kilometres travelled between 2005 and 2018 implies that trucks are running empty more often. The combination of trends in average distances and average loads has resulted in the plateauing trend in average tonne kilometres per heavy vehicle.

Road transport freight rates (cents per net tonne kilometres) are another indicator of performance. The conceptual relationship between productivity growth and freight rates is not one-for-one due to other influences (such as demand growth, intermodal shifts, the nature of the freight carried, and the price of fuel and wages), but all else equal, productivity is expected to manifest itself as lower rates. Periods of strong productivity growth are evident in freight rate reductions during the 1970s and 1980s (figure 7.15). In recent times, productivity and freight rates have remained steady.

Figure 7.15 Road transport freight rates in Australia have levelled out

Real road transport interstate freight rate (cents/net tonne kilometres),
2011-12 dollars, 1965 to 2018

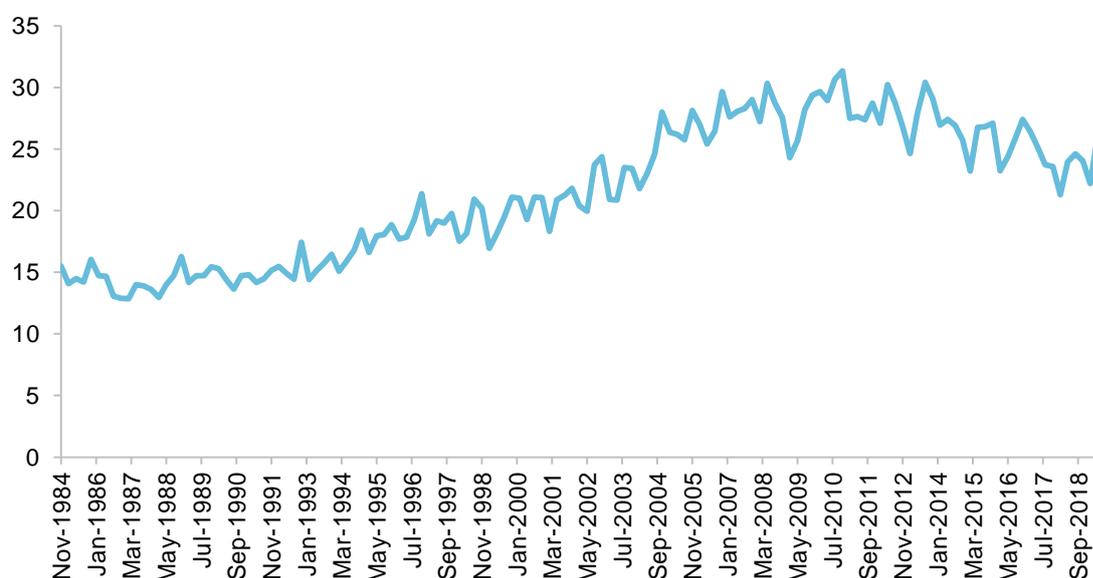


Source: BITRE (2017, p. 1).

Road transport labour productivity measures do not indicate substantive improvements either. Real road transport output per employee has been declining since the global financial crisis in 2008, a deviation from the growth in the decades before (figure 7.16). Real output per hour worked for in-house road transport has also been flat between 2010-11 to 2015-16 (ABS 2018a) (equivalent data for for-hire transport are not publicly available).

Figure 7.16 Road transport output per employee has declined since 2008

Quarterly road transport gross value added per employee (\$ million), chain volume measure, Nov 1984 to Nov 2019



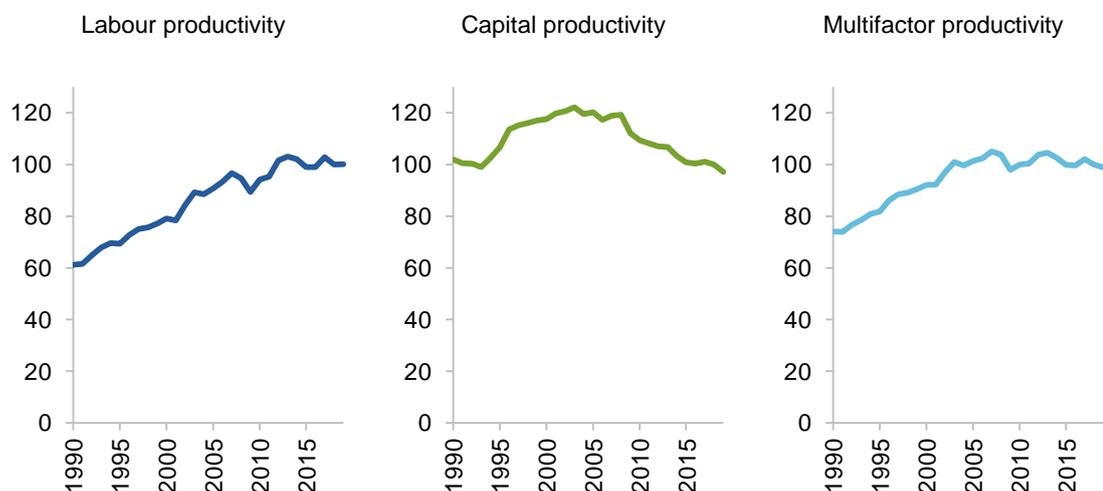
a Road transport is comprised of both freight and passenger transport. **b** Real output per employee is equal to total real gross value added divided by a weighted number of full-time and part-time employees. The weighting assumes that part-time workers are equal to half a full-time worker. **c** Chain volume measures are adjusted for inflation, by computing the output for each year in the prices of the preceding year, and then 'chain linking' the data together to obtain a time-series of output figures from which the effects of process changes have, at least in theory, been removed.

Sources: Commission estimates based on ABS (*Australian National Accounts: National Income, Expenditure and Product, Sep 2019*, Cat. no. 5206.0, table 6) and ABS (*Labour Force, Australia, Detailed, Quarterly, Nov 2019*, Cat. no. 6291.0.55.003, table 6).

In the transport, postal and warehousing sector more broadly, output has continued to grow since 1990 (as measured by real gross value added). Labour inputs have also grown but at a slower rate than output. This has resulted in a steady increase in labour productivity until 2011, but it has since flattened out (figure 7.17). Capital productivity on the other hand has declined since its peak in 2003, owing to a sharp rise in capital inputs. The combination of labour and capital productivity trends has resulted in a flat trend in multifactor productivity since the early 2000s.

Overall, the levelling out of heavy vehicle performance provides evidence that the reforms have not led to the substantial productivity improvements (at the national level) predicted in the HVNL regulation impact statement.

Figure 7.17 Transport, postal and warehousing productivity indexes
1989-90 to 2018-19, base year = 2017-18



^a Productivity indexes are gross value added based measures. Labour and multifactor productivity indexes are based on hours worked.

Source: ABS (*Estimates of Industry Multifactor Productivity, 2018-19*, Cat. no. 5260.0.55.002, tables 1, 6 and 7).

Productivity impact of the reforms

It is clear on the indicators discussed above that there has been progress in several areas that improve productivity. Access has improved since the reforms were put in place, through the pre-approval process and notices. However, improvements on major freight routes have been limited and it is not clear that these have yet achieved the necessary scale to produce large productivity benefits. There is limited information on the realised benefits of the access network expansions and harmonisation of access conditions that have occurred so far. The number of higher productivity vehicles has grown which suggests that some operators are finding profitable opportunities and routes on which to operate, but the increase in these numbers appears small relative to the size of the whole heavy vehicle fleet. They have also not led to large improvements in heavy vehicle performance at a national level.

While the COAG reforms have undoubtedly led to productivity benefits, they have not achieved the degree estimated in the regulation impact statement. The Commission considers that the original productivity growth estimates were optimistic.

Some further productivity gains can be driven by the industry itself under the provisions of the HVNL and regulatory oversight of the NHVR. Incremental improvements in heavy vehicle access can be facilitated by the NHVR, but changes to access networks will not occur without the agreement and participation of road managers. Some recommendations to improve access are discussed below. Beyond this there is scope for larger productivity gains through measures discussed in chapter 10.

FINDING 7.3 – PRODUCTIVITY GAINS FROM THE REFORMS HAVE BEEN SMALLER THAN EXPECTED

Productivity gains from the reforms have been much smaller than the original optimistic estimates. Despite some improvements in heavy vehicle access, there has been little improvement on key freight routes, and the increase in the number of higher productivity vehicles has been small relative to the size of the whole heavy vehicle fleet. There is scope for significant further productivity gains with additional reforms.

7.6 Improving heavy vehicle access

While there have been some improvements in access networks, heavy vehicle access still depends significantly on permit applications. Some local governments have been able to deal with the new challenges of assessing access requests. For example, permit applications in Greater Dandenong City Council grew from 10 a year before the HVNL to over 3000 in the first year of the reforms. This local government has since reduced the number of requests to 3 to 4 a week by assessing and upgrading road infrastructure, and then providing access for most vehicles via pre-approvals (Di Cristoforo 2018, p. 28). Other local governments have had more difficulties adjusting to the new regime. As described in section 7.5, some road managers have longer permit processing times. Further, different approaches by different road managers (both at the state and local government levels) have led to different assessments of access on similar roads (Di Cristoforo 2018, p. 8).

The NTC's review of the HVNL is looking into addressing some of the barriers to heavy vehicle access (NTC 2019a). The NTC acknowledged issues such as:

- road managers not having adequate expertise or resourcing to fully understand complex vehicle characteristics and infrastructure capacity (also discussed in chapter 10)
- the prevalence of permits for low-risk vehicle types that have been previously approved
- the long 28-day timeframe allowed for road managers to assess permit requests (given that most can grant consent within a shorter period), and the lack of mechanisms in the law to address issues with road managers not providing a response within that timeframe
- inconsistent use of guidelines for granting access, which are approved by ministers under the HVNL but are not mandatory for road managers to use
- the lack of evidence provided for refusing access in some cases, and absence of external review of road manager decisions.

Some participants in this inquiry and other reports have commented on similar issues (for example, ATA, sub. 32, pp. 16–21, sub. DR76, p. 19; LGAQ, trans., pp. 102–103; MTA-SANT, sub. DR47, pp. 5–6; NatRoad, sub. 7, p. 15, sub. DR55, p. 14; NFF, sub. DR48, pp. 9–10; VFF, sub. DR53, p. 5; Di Cristoforo 2018; WSP 2018). The NTC is consulting with government and industry, and is expected to present policy options to ministers in November 2020 (NTC 2019b).

While some improvements to the system would require legislative change (for example, to the HVNL), there are some options that can be pursued independently, discussed below.

FINDING 7.4 – THE PROCESSING OF SOME ACCESS DECISIONS IS SLOW AND LACKS EVIDENCE

Some local governments struggle to deliver timely heavy vehicle access assessments, and access decisions often lack transparency. Road managers are using the National Heavy Vehicle Regulator guidelines for granting access inconsistently, which can result in different assessments on similar roads.

Encouraging risk-based access decisions

Risk-based permit assessments would help to simplify the process of permit approvals for road managers. The 2018 Review of OSOM Access Arrangements suggested that ‘envelopes’ of vehicles could be developed based on the characteristics of vehicles that have been approved on particular routes in the past (WSP 2018, p. 25). This was also raised as part of the HVNL review (NTC 2019a, pp. 42–43) and other parties have expanded on the idea (for example, ALC, sub. DR61, p. 15; ALGA, sub. DR75, p. 3; NFF, sub. DR48, p. 9; NHVR 2019g). The NHVR (sub. DR72, pp. 4–5) suggested a risk-based approach be used for access, based on the performance of a vehicle within an agreed envelope:

The NHVR does not propose to diminish the authority of road managers in consenting to heavy vehicle road access. Rather, the NHVR would take a more proactive role in working with road managers - particularly by categorising access cases by risk. This would support road managers by better informing them of which are the key risks they should and need not focus on assessing to determine whether to consent to access or not. An envelope represents a heavy vehicle type, or characteristic to which a road manager has previously consented to access on a given road. The NHVR would use that consent as a precedent in assessing other heavy vehicle types with characteristics within the precedent’s ‘envelope’ as low risk access propositions.

Local government associations generally supported the idea of more information to help road managers make access decisions based on risk. Local Government New South Wales (trans., p. 53) said that information from the NHVR on past approvals for similar vehicles may help. The Local Government Association of Queensland (trans., p. 99) supported information to allow risk profiles of vehicles to be compared. The Australian Local Government Association (trans., p. 208) stated that local governments were open to the idea of simplified heavy vehicle classifications (such as through envelopes) if it aided their decision making and did not remove their right to access decisions.

Along these lines, the NHVR and road managers should negotiate more flexible arrangements for permit pre-approvals. For example, the NHVR could develop envelopes using information on past permit approvals for a road manager on a given road. Subject to the road manager agreeing to pre-approval arrangements, the NHVR could then allow all vehicles that pose no greater risk than previously approved vehicles of that same type (such

as freight vehicles and OSOM vehicles) to be automatically granted access via permit. The NHVR and road managers could also negotiate greater flexibility with regards to the timeframe in which permits become automatically approved. For example, road managers may choose to allow a few days to be able to review permit applications deemed to be low risk based on previous approvals, and allow the NHVR to grant automatic approval unless the road manager takes further action within that timeframe.

Overall, this would help road managers better understand the risk posed by certain types of vehicles, relative to previously assessed vehicles, and help reduce the time taken for lower risk vehicles to be granted access. The success of envelope-based pre-approval arrangements should then be used as a basis for expanding as-of-right access for similar vehicle types, reducing the need for operators to apply for permits (discussed below).

RECOMMENDATION 7.3 – RISK-BASED ASSESSMENT OF HEAVY VEHICLE ACCESS PERMITS

The National Heavy Vehicle Regulator should negotiate with individual road managers to facilitate a risk-based assessment of permits, using information from previous access permit approvals on each route. This information should be used to construct more flexible pre-approved permit arrangements with road managers.

Transparent permit decisions and processing times

There is scope for the NHVR to improve the public reporting of permit decisions and processing times. The NHVR only publishes permit information at a national level in its annual report (NHVR 2019a, p. 64). The NHVR (trans., p. 91) supported making more permit information public. More detailed reporting would help industry identify where access may or may not be allowed via permit, based on earlier decisions. It would also help identify areas with longer processing times or higher refusal rates, which might require more resources and investment to help improve access.

Heavy Vehicle Industry Australia (sub. DR70, p. 3) stated that ‘permits granted should be accessible in the public domain and any application that is refused must be published along with a reason for refusal’. ALGA (trans., p. 209) was also open to greater transparency in permit applications.

Due to the vast numbers of permits processed each year, summary information may be most useful to industry. For example, reporting could be in the form of more detailed summaries of permit access decisions, including reasons for rejection and time taken to process permits by both road managers and the NHVR. The NHVR could also build on its online route planner tool, which includes heavy vehicle access network maps. This tool could include additional information on permit approval rates and average processing times, by vehicle type, for roads that are commonly applied to. Consultation would better inform the form in which this information should take.

RECOMMENDATION 7.4 – TRANSPARENT ACCESS PERMIT DECISIONS AND PROCESSING TIMES

The National Heavy Vehicle Regulator should publish detailed information online about access permit decisions and processing times. The National Heavy Vehicle Regulator should engage with industry and road managers to determine the form of this information.

Promoting gazetted access networks

There will likely always be a need for access permits and pre-approvals on some routes, but gazetting access networks through clearly defined notices should be the key goal, especially for commonly used routes and vehicles, to reduce the regulatory and administrative burden of applying for and assessing permits. The NHVR should continue its focus on consulting with industry and road managers to further expand and harmonise networks for high productivity freight vehicles. While access decisions ultimately rely on road manager approval, and may require infrastructure upgrades, the NHVR has an important role to play in:

- communicating the productivity and safety benefits associated with the use of high productivity freight vehicles
- promoting a consistent framework for considering road access.

The NHVR (sub. DR72, p. 6; 2019a, p. 18) suggested focusing on gazetting access for low-risk heavy vehicle movements in the short term. This includes expanding PBS road networks to (at least) those roads where corresponding non-PBS heavy vehicles can already operate under notice. The NHVR also proposed gazetting low risk class 1 OSOM vehicles because permit applications for these vehicles are almost always approved. Further analysis of permit approvals would inform other routes and vehicle types for which notices could be usefully developed.

Industry participants were generally supportive of expanding access through notices (for example, ATA, sub. DR76, p. 16; HVIA, sub. DR70, p. 3; RMAC, sub. DR52, p. 3; VFF, sub. DR53, pp. 4–5). Local government associations noted that gazettals should be considered by local governments in some instances (ALGA, sub. DR75, p. 3; Local Government New South Wales, trans., p. 52), and involve local government land use and traffic planners as well as road managers (LGAQ, sub. DR51, p. 2).

Some local governments perceive permits to provide some visibility of the number of heavy vehicle movements occurring on their roads (ALGA, sub. DR75, p. 3; LGAQ, sub. DR51, p. 2; Local Government New South Wales, trans., p. 51). This knowledge is important for ensuring that roads are being adequately maintained and that amenity is not significantly affected. The gazettal of a route may lead to an increase in the number of heavy vehicle movements, which could have further effects on infrastructure maintenance and amenity.

Permits themselves provide a limited view of heavy vehicle movements. The NHVR (trans., p. 88) stated that ‘if [a vehicle] has a three-year permit, it could move three times, it could move 3000 times’. Greater use of other data and technology can provide better visibility of vehicle movements, including on gazetted routes in the absence of permits. Telematics data in particular can provide detailed information on road freight movements (ALGA, sub. DR75, pp. 6–7; ATA, sub. 32, p. 21; LGAQ, sub. DR51, p. 2). Local governments should harness the insights afforded by these data to inform heavy vehicle access networks and infrastructure planning. The National Freight Data Hub may become a useful source for these data in the future (chapter 8).

Overall, there is scope to expand access through gazetted networks, particularly for low-risk heavy vehicle movements, without removing visibility of these movements for road managers. Road manager decisions would still need to satisfy infrastructure capacity and reasonable community expectations, including prohibiting access where it would be inappropriate. Where the road network cannot sustain access for larger heavy vehicles, there is scope to improve and provide additional truck stops and logistic centres so that vehicles can be broken down into smaller units.

RECOMMENDATION 7.5 – EXPANDING AS-OF-RIGHT HEAVY VEHICLE ACCESS NETWORKS

The Council of Australian Governments should direct road managers (including the state road authorities) to work with the National Heavy Vehicle Regulator to expand key freight routes covered by notices, allowing as-of-right access for larger vehicle types. The focus of this work should include expanding gazetted access networks for:

- vehicles approved through the Performance-Based Standards (PBS) scheme (including PBS B-doubles, A-doubles and B-triples), at least to match the networks for the equivalent non-PBS vehicles
- types of vehicles for which permit applications are almost universally approved.

Road managers should upgrade road infrastructure to allow heavy vehicle access where the benefits exceed the costs. Where road network constraints prevent heavy vehicle access, road managers should ensure that there are adequate truck stops and logistics centres to allow larger vehicles to be broken down into smaller combinations.

An agenda for improving heavy vehicle productivity

As highlighted in section 7.4, there are many players in the system that have a role in driving productivity in road transport. Governments facilitate or inhibit productivity through the regulatory environment they create. The NHVR affects productivity through how it administers regulation, including through the regulatory burden it places on operators. The commercial decisions of heavy vehicle operators are also important. Operators make vehicle investment decisions based on their expected capacity utilisation. Improving access for more productive vehicles incentivises operators to invest in them, allowing freight to be delivered more efficiently. Road managers are responsible for planning and designing road networks

and providing for vehicle access. Road infrastructure has large investment and maintenance costs, and heavy vehicle access can come with safety risks and amenity costs. The benefits of increasing access are likely to be greatest on key freight routes with high utilisation.

Although the recommendations described above would provide incremental improvements to heavy vehicle productivity, the means to achieving the largest productivity gains lie elsewhere, including:

- a more flexible approach to regulation that facilitates greater innovation in the sector (chapters 9 and 10)
- the Heavy Vehicle Road Reform agenda, which is considering reforms to the way governments plan, govern, invest in and fund roads (chapter 10)
- greater collaboration and resource sharing between road managers to address issues with the resourcing and capability of local governments to assess access requests and provide and plan for road infrastructure (chapter 10)
- amending the Australian Design Rules to allow for new transport technologies that improve productivity (chapter 8)
- the National Freight Data Hub, which can provide an important platform for transport data, and provide more information on how roads are being used by operators, helping with infrastructure planning and access decisions (chapter 8).

These important drivers of future productivity are discussed in the remaining chapters.

8 Transport technology and data

Key points

- New technologies have the potential to deliver productivity, safety and environmental benefits in the transport sector. However, with new technology comes new costs and risks.
- Regulation should promote safety without imposing an unnecessary regulatory burden or stifling innovation. Regulation should be technologically neutral and outcomes-based, prevent regulatory ‘gaps’, enable interoperability of new technologies, enable trialling and testing of new technologies, and be flexible and adaptable.
- The speed at which industry adopts new technologies has implications for productivity and safety. The Australian Government should amend the Australian Design Rules and in-service vehicle standards to allow for the timely uptake of new and internationally approved transport technologies, including automated technologies. Where the Government assesses an international standard to be unsafe for the Australian context, evidence should be provided through a transparent review of the Australian Design Rule, conducted in a defined timeframe.
- As a priority, the Australian Government should address specific issues with the Australian Design Rules identified as significantly hindering productivity or safety, such as width and mass limits discouraging the use of newer, safer technologies.
- Telematics data from heavy vehicles is collected by many parties and used for many purposes. Consolidating these data into a secure central repository could maximise their value.
- Governments should prioritise the use of data with the greatest potential to improve productivity in the transport sector. This includes sharing data to facilitate coordination between road users and infrastructure managers, to inform the provision and management of road infrastructure, decisions around permits and road access for heavy vehicles, and assist in the development and implementation of the Heavy Vehicle Road Reform agenda.
- Autonomous technologies remove or reduce the need for a human operator and have the potential to improve the safety and productivity of freight transport and the transport sector more broadly. However, many Australian laws and regulations (including road rules, insurance schemes and driver licencing) assume a human driver.
- Determining the safety of autonomous technologies can be challenging, because the underlying code is often created in opaque environments and may change over time. As a first step, regulators should identify the risks posed by the use of algorithms in transport technologies, draw on evidence from overseas research and regulators, and employ staff with the relevant skills to assess algorithms and autonomous transport systems.
- There is uncertainty around determining legal liability when autonomous driving systems breach legislation or cause harm. A general safety duty should apply to all parties with a significant influence over the safety operation of autonomous transport technologies. This may need to be supported by prescriptive rules where the assessed risks are high.

The terms of reference state that the Commission should examine opportunities for reform to ‘further integrate and harmonise the regulation of the national freight market’, including the focus and remit of the National Heavy Vehicle Regulator (NHVR), Office of the National Rail Safety Regulator (ONRSR) and Australian Maritime Safety Authority (AMSA). However, reform of the national freight market is broader than the COAG reforms harmonising safety regulation and the operation of the national regulators and the national laws. There are many opportunities — outside of the national regulatory regimes — for governments and industry to make transport safer or more efficient, and to reduce compliance costs for transport users.

This chapter focuses on new and emerging transport technologies, the implications of these technologies for stakeholders in each transport mode, and any need for regulatory reform. The chapter examines:

- the state of technology in the transport sector, including emerging and potentially disruptive technologies (section 8.1)
- the increasing creation and use of transport data by these technologies (section 8.2)
- the implications of increased automation of transport technologies (section 8.3).

8.1 Transport technologies

Technological improvements have the potential to lift productivity, safety and environmental performance in the transport sector. However, technological progress can bring new sources of risk. For example, there may be risks associated with the way new technologies interact with existing technologies or infrastructure. There may be risks relating to software design and compatibility. In the case of autonomous technologies, there are potentially risks of technology failing to operate when needed, or activating unnecessarily.

This section outlines some disruptive transport technologies and the challenges in regulating them. It then considers the state of transport technology and potential actions for government.

Challenges in regulating emerging transport technologies

Transport technologies are changing rapidly. Emerging transport technologies can be broken down into four categories: intelligent transport systems, autonomous technologies, new models of ownership and new physical means of transport (box 8.1). Intelligent transport systems (ITS), transport data and automation are the technologies most relevant to freight transport and the COAG national transport reforms.

Box 8.1 **Emerging transport technologies**

Intelligent transport systems

Intelligent transport systems (ITS) is a collective term for the use of information and communications technologies in transport vehicles and infrastructure. ITS can generate or use data in various forms, enabling analysis to inform infrastructure planning and operations. Some of these technologies are described as ‘cooperative intelligent transport systems’ (C-ITS), which enable vehicles to wirelessly communicate with other vehicles, infrastructure or other parts of the road network, often using low latency communications technologies (for example, 5G). Some examples of ITS include:

- telematics — remote monitoring of vehicles through wireless communications
- machine-to-machine and machine-to-infrastructure technologies, such as Dedicated Short Range Communications (DSRC) between vehicles
- signalling and other traffic management technologies
- sensors — technologies that gather data to inform ITS and planning decisions, including smart phones, cameras, and in-vehicle sensors (Australian Academy of Technology and Engineering 2019, p. 57).

Autonomous technologies

Autonomous technologies are technologies capable of sensing the environment and navigating without human input. These technologies can also rely on machine learning and artificial intelligence. Some examples include:

- driverless and autonomous vehicles, trains and maritime vessels
- heavy vehicle platooning^a
- partially-automated vehicles and enhanced safety features, such as autonomous emergency braking, self-parking or traffic jam assist
- automated warehousing and freight handling technologies, such as autonomous forklifts.

New models of ownership

New business models and forms of ownership are emerging in transport. Better customer interfaces, similar to the model pioneered by Uber in passenger transport, are being used for freight transport. These may enable more cost-effective deliveries and raise productivity by using the excess capacity of freight operators. However, they may also change the nature of the supply chain, particularly regarding liability and responsibility for safety. Examples of new models of ownership in transport include:

- car-sharing and ride-sharing services providing a viable alternative to car ownership
- apps allowing heavy vehicle owners and drivers to register their availability for transport tasks via a platform app, such as those by Uber and Amazon in the United States, or Eastern Plant Hire and Channel 40 in Australia (Williams 2017)
- mobility-as-a-service (MaaS), which encourages a shift from personally-owned modes of transport by enabling individuals to purchase a combination of transportation services from public and private providers through a single access point (Zipper 2018).

(continued next page)

Box 8.1 (continued)

New physical means of transport

Several new or emerging physical transport technologies have the potential to be highly disruptive to existing markets. These include:

- remotely piloted aircraft (RPA) and drone technologies. RPA and drone technologies have the potential to ease the ‘last mile’ problem of delivering goods in cities. However, these technologies create new issues relating to safety, privacy and amenity. Trials of this technology are underway in Canberra
- low and zero emission vehicle technologies. Advances in various technologies including battery storage, rooftop solar and alternative fuels may lead to significantly increased uptake of low emission vehicles as the price of the technology drops. This could have significant environmental benefits. However, such technologies will require significant changes to infrastructure (for example, the creation of electric vehicle charging stations)
- 3D printing. This has the potential to reduce the freight task by allowing objects to be printed at the destination, or printed in designated ‘hubs’ in convenient locations.

^a Heavy vehicle platooning involves several trucks closely following one another, connected using vehicle to vehicle communication. The lead truck is typically controlled by a human driver, while the following trucks operate autonomously.

A framework for assessing the regulation of transport technologies

Effective regulation can enable the benefits of new and emerging transport technologies to be realised in a manner that minimises externalities and risks. Different government policy levers — various forms of regulation, taxation or spending — can shape how markets develop, adopt and diffuse new technologies (chapter 2). The Commission previously considered how governments should respond to emerging technologies, and outlined the key roles of government as being to:

- *regulate frameworks* in which firms and markets operate, pertaining to issues such as market power and information provision to consumers
- *enable new technology* development and adoption — establishing public infrastructure, setting standards to ensure interoperability between technologies, and investing in education and training to ensure the workforce is appropriately skilled
- *mitigate risks* — smoothing the structural adjustment process for workers and firms by ensuring the social safety net evolves with changing work practices, and safeguarding individuals’ privacy and security
- *provide public services* for the community (PC 2016a, p. 32).

In applying this framework to the context of transport technology, there are several considerations for governments. In order to enable technology development and adoption, governments need to consider the adequacy of infrastructure. For example, the uptake of electric heavy vehicles depends partly on the availability of charging stations along freight routes, the distance or time which the vehicle can travel without charging, and the time taken to recharge a vehicle battery.

In some cases, technological progress may also require new skills and capabilities from the workforce. In many cases, transport technology has developed in ways that are simpler for transport workers to operate. However, regulator staff may require new technical knowledge to assess compliance of a new technology with safety legislation.

Regulatory frameworks will also need to be designed to both enable new technology and to mitigate risks. For example, where safety regulations are outcomes-based, they may be more adaptable to changes in technology. Regulation should also be applied at a level proportional to the negative externality or risk being addressed. Governments may need to consider how to remain technologically neutral, which may require a focus on coordination, interoperability, and the use of trialling and testing phases.

The remainder of this chapter uses these issues as a framework to consider the state of technology, the use of data, and transport automation, and assess the extent to which regulations should change.

The state of transport technology

The age of transport technologies and supporting infrastructure, and the rate of uptake of new technologies, have implications for safety and productivity.

Heavy vehicles

Australia has a relatively old heavy vehicle fleet compared with other developed countries. In 2015, the average age of an Australian heavy vehicle was 13.9 years — significantly higher than in various European countries (for example, 6.7 years in Germany and 7.6 years in Great Britain), South Africa (8.9 years) and Japan (11.9 years) (Truck Industry Council 2019, p. 24).

There are also significant delays in adopting some new safety technologies. The Heavy Vehicle Industry Association (2018) advised that, when a new safety feature is mandated, it takes over 20 years to become universal in the heavy vehicle fleet. New heavy vehicle technologies (for example, fatigue monitoring technologies) are sometimes available but not used by operators. For example, heavy vehicles purchased new from Europe with advanced telematics often have these features deliberately switched off in Australia due to privacy concerns. This has consequences for both the productivity and safety of transport technologies.

Using new transport technologies can lead to productivity improvements for industry. The Freight and Logistics Council of WA (sub. 22, p. 2) argued that facilitating the introduction of new transport technologies improves the international competitiveness of trade-exposed products. In this instance, there is value in removing barriers or disincentives to the adoption of the technology. The speed at which industry adopts new technologies also has implications for safety. More frequent adoption or renewal of fleets increases the likelihood of new safety equipment being implemented. However, there are some disincentives for operators to update their safety technologies.

The Australian Design Rules (ADRs) set national standards for vehicle safety, anti-theft technologies and emissions. All road vehicles must comply with the relevant ADRs at the time of manufacture or supply (importation) to the Australian market (DITCRD, sub. DR74, p. 4). The ADRs prevent the use of unmodified imported heavy vehicles and, in combination with the regulations enacted by the Heavy Vehicle National Law (HVNL), discourage or delay the adoption of new safety technologies. For example, regulations around heavy vehicle mass and width limits result in operators removing safety technologies from imported vehicles to reduce weight or width⁹. The Transport and Infrastructure Council (TIC) argued these limits reduce the availability of safer, cleaner vehicles and that manufacturers spend \$15 to \$30 million per year redesigning heavy vehicles to meet Australian width restrictions (2018, p. 13).

Many standards are implemented by advanced economies from which Australia imports most of its heavy vehicles. The Australian Government aims to harmonise national vehicle safety standards, including the ADRs, with international regulations ‘where possible’ and considers adoption of the international regulations of the United Nations Economic Commission for Europe (UNECE) on an opt-in basis (DITRDC 2018). However, there is some adaptation of standards to reflect Australian conditions, including ‘Australian road safety concerns, road network capability, and fleet and market characteristics’ (DITCRD, sub. DR74, p. 4). While the ADRs are substantially aligned with international standards, several key discrepancies have been identified by stakeholders (box 8.2). Stakeholders have also raised concerns regarding the speed with which ADRs are amended, and the duplication of similar processes undertaken overseas (DITCRD 2019b, p. 21).

⁹ Australian heavy vehicles are required to have a width of 2.5 metres or less under the ADRs. This compares to 2.55 metres in Europe and 2.6 metres in the United States. A recent Austroads study (2019) supported increasing the allowed width of Australian heavy vehicles to 2.55 metres, but argued that a further increase to 2.6 metres should only be considered following 2.55 metre vehicles being ‘proven’ on the network.

Box 8.2 Stakeholder views on the Australian Design Rules

Some stakeholders have raised concerns with Australian Design Rules (ADRs) that discourage or prevent the use of particular technologies, with no productivity or safety benefit.

- The National Transport Commission (2019d, p. 26) argued that steer axle mass and vehicle width limits in the ADRs are inconsistent with international standards:

Europe and North America have higher limits for both steer axle mass and width of heavy vehicles. As a result, vehicles fitted with advanced safety technology can comply with international limits but exceed Australia's limits. These vehicles have to be redesigned to meet our heavy vehicle standards. This can substantially delay the entry of these safer vehicles into the Australian market and, in some cases, prevent it altogether. (NTC 2019d, p. 26)
- The National Heavy Vehicle Regulator (trans., p. 94) argued that some ADRs are overly restrictive, including those around 'width, lights [and] length', and the regulator should have more flexibility to assess the impact of heavy vehicle technologies on road networks to prevent 'losing out on significant benefits in innovation in technology in vehicles'. They also argued that different standards are appropriate on different networks, and that allowing longer vehicles can have safety benefits in some areas (such as allowing the use of bull bars on the Nullarbor), but would not necessarily be appropriate for urban environments.
- The Truck Industry Council (2018, pp. 6–8) highlighted that various heavy vehicle safety technologies (including electronic stability control, autonomous emergency braking systems, lane departure warning systems, and fatigue warning systems) were mandated in large overseas markets over a decade ago. They also argued that despite this, many of these technologies are not permitted by the ADRs, which has prevented the voluntary adoption of new technologies in Australia.
- The Electric Vehicle Council (sub. DR67, p. 5) argued that ADRs discourage the uptake of electric heavy vehicles, because the 'weight of the battery impacts the truck payload under mass vehicle limits' and that the ADRs should allow for electric heavy vehicles through mass limit exemptions and waivers.

Part of the success of the Performance-Based Standards (PBS) arrangements (chapter 7) appears to be that the scheme allows new designs to sidestep the ADR processes. According to the National Transport Commission (NTC), such heavy vehicle standards present an unintended barrier to the supply of safe vehicles to the Australian market (2019d, p. 26). The ADRs may also act as a protectionist instrument, by reducing the heavy vehicle models available in Australia to those made in Australia and those imported vehicles which can easily be altered to meet Australian requirements. Reforms to the ADRs may help to address Australia's lagging in the adoption of safety technology.

The Department of Infrastructure, Transport, Regional Development and Communications (DITRDC, sub. DR74, p. 4) argued that restrictions around vehicle size and mass were introduced to protect infrastructure (such as roads and bridges), prevent head-on crashes and reduce conflict with other road users on narrower roads. However, they also acknowledged that these restrictions can result in some manufacturers not fitting some safety technologies to imported vehicles. DITRDC suggested that these regulations, as well as the network capacity for larger and heavier vehicles, were being re-examined as part of the National Road Safety Action Plan, endorsed by TIC. The Commission considers that the Australian

Government should address specific ADRs identified by stakeholders as providing a disincentive to use safer vehicle designs (box 8.2) as a priority.

Other safety technologies are available but are not widely used, due to not being recognised by the HVNL. For example, the HVNL does not recognise the potential role of technology to observe truck driver fatigue (NTC 2019a, p. 34). The use of fatigue monitoring cameras and other sophisticated monitoring systems are constrained by the HVNL, despite potentially offering an innovative and effective solution to monitor fatigue in real time. The head of the Queensland Trucking Association commented that ‘we live in a digital world and we’re bound by analogue legislation’ (McKay 2018). The HVNL also disincentivises the use of twin steer prime movers, which have the potential to improve both productivity and safety, through ‘artificially low’ axle and bridge mass limits (NTI, pers. comm., 2 March 2020).

The Australian Government should take a risk-based approach to approvals for new transport technology, with a general preference for encouraging the adoption of new technologies that are likely to have positive safety impacts. To minimise regulatory burden, the Australian Government should facilitate easier adoption of technologies adopted in other leading economies through increased recognition of international standards.

This could be achieved by ensuring that international standards from advanced economies are treated as ‘deemed to comply’. However, as outlined above, DITRDC may choose to not accept an international standard where they deem it to be unsuitable for the Australian context. In such cases, DITRDC should be required to provide evidence as to why it would be unsafe to apply the international standard in Australia, through a transparent review process, conducted in a defined timeframe. This approach would enable a compromise between prescriptive and principles-based regulation by providing industry with guidance without precluding alternative options, and would encourage the use of new technologies with the potential to improve the productivity and safety of heavy vehicles.

FINDING 8.1 – REGULATION OF HEAVY VEHICLE TECHNOLOGIES

Heavy vehicle regulations, including the Australian Design Rules and some regulations enacted by the Heavy Vehicle National Law, have discouraged or delayed the use of newer, safer technologies. More flexible, risk-based regulation could improve safety by encouraging the uptake of twin steer prime movers and fatigue monitoring technologies.

Rail and maritime

The uptake of new technology is less problematic in rail than in some other sectors, and the locomotive fleet has become younger in recent years. As of 2019, about half of the locomotive fleet was aged 12 years or less, compared with 16 or less in 2016 (BITRE 2016, p. 59, 2019, p. 69). Newer locomotives are generally used for ‘frontline’ duties, while older locomotives tend to be used for secondary duties such as providing additional power behind new locomotives or doing yard duties (BITRE 2018, p. 63). The risk-based regulatory

regime outlined by the Rail Safety National Law also means that new technologies with proven safety benefits can be introduced with relative ease (ONRSR, sub. 21).

While there is no available data on the average age of Australian domestic commercial vessels, concerns about the age of the maritime fleet have been raised by stakeholders. Indefinite grandfathering provisions in the Marine Safety National Law create a disincentive for operators to update their fleets. Grandfathering issues are covered in detail in chapters 4 and 6.

Encouraging newer, safer technologies

In some cases, technological progress can have a profound effect on safety, just as seat belts, anti-lock braking systems (ABS), and airbags provided such benefits in past decades. The NTC (2018b, p. 14) found that Electronic Stability Control and Roll Stability Control may prevent between four and 56 per cent of fatal crashes. The NTC also predicted that fatigue and drowsiness detection devices have the potential to prevent between four and ten per cent of fatal crashes, reduce the severity of injuries and achieve cost savings of up to \$28 million.

New technologies may also offer less costly, but at least equally effective, ways to address safety risks. For example, some operators already use fatigue detection technology (with supporting real-time monitoring), notwithstanding the duplication with mandatory fatigue management. Recognition of this technology in regulation could enable a more flexible approach to fatigue management, and remove the need for work diaries for many operators. Another example involves the use of telematics, which could help determine the appropriate scheduling of vehicle inspections (as opposed to blanket rules for annual inspections). It has been estimated that new heavy vehicle technologies could reduce operating costs by 50 to 70 per cent over the next 10 years (Freight and Logistics Council of WA, sub. 22, p. 2).

Policy decisions can influence the adoption of new transport technologies. Various stakeholders argued that transport safety technologies should be mandated. For example, the Australian Trucking Association (sub. 32, p. 4) argued that the Australian Government should mandate autonomous emergency braking (AEB) for new heavy vehicles and that all new rigid trucks should have stability control. The Freight and Logistics Council of WA (sub. 22, p. 2) argued that:

There is also a role for the regulators to provide commercial incentives to encourage the adoption of new technology, particularly in regards to cleaner and safer heavy vehicles. The regulators must work closely with industry in this regard.

A recent regulation impact statement from DITRDC (2019a) recommended that all new heavy vehicles be fitted with AEB, through the development of a new ADR. However, a new ADR would not address the large proportion of older heavy vehicles that will continue to operate. DITRDC (2019a, p. 6) noted that:

As retro-fitting sophisticated technology such as AEB would generally be high cost and disruptive for current vehicle owners, the action has focused on new vehicles only.

Mandating new technology may be justified provided the safety benefits, compliance costs and any impact on competition have all been carefully considered. Such decisions should be based on evidence regarding the potential gains for safety, the related compliance burden, and the potential effects on competition. Generally, governments should instead focus on setting outcomes-based standards and removing any barriers to effective new technologies being introduced.

Technological standards and interoperability

Technological standards will need to be continually updated to support new transport technologies and enable interoperability between transport technologies. For example, vehicle standards do not have adequate regard to telematics and some automated safety technologies, such as blind-spot warnings and lane change assistance. Nationally inconsistent standards could be a regulatory barrier to market entry, and new manufacturing standards encompassing autonomous driving systems, including the physical technology, will be required.

Consistent standards will be needed to facilitate the use of cooperative intelligent transport systems (C-ITS). As C-ITS relies on technologies ‘communicating’ with each other and with the surrounding infrastructure, ensuring that technologies ‘speak the same language’ through standardised messaging will be important (Australian Academy of Technology and Engineering 2019, p. 52). These national standards could be developed collaboratively with industry (Australian Academy of Technology and Engineering 2019, p. 60). The Australian Communications and Media Authority recently introduced a Class Licence to enable the use of ITS in Australia (ACMA 2018). This licence reserves a certain frequency of radio spectrum and is consistent with international standards to enable interoperability.

Enabling interoperability will be important, particularly given that Australia is likely to be a net importer of ITS technologies. In the rail sector, one major inconsistency is that signals vary across jurisdictions and track systems (unlike the road and maritime sectors). Train drivers crossing into other jurisdictions therefore need to understand different signalling systems. Interoperability of automated transport technologies was raised as an issue by the Freight on Rail Group (FORG). FORG described the use of the Advanced Train Management System (ATMS), an automatic braking and advanced signalling system used by rail operators in some States, as best practice (sub. 8, p. 2). However, operators in other States use an alternative technology — the European Train Control System (ETCS).

In regards to autonomous vehicles, the NTC (2019c, p. 49) argued that:

In global terms, Australia is a secondary and relatively small market. This means Australia benefits from international regulatory decisions and from aligning its rules with international standards. We recognise that if Australia imposes standards for automated vehicles that are inconsistent with international regulation, manufacturers may not make their automated vehicles available in Australia. This would deprive Australians of the benefits of automated vehicles or delay these benefits.

Given that Australia is a relatively small market, COAG should aim for national and international consistency of laws and standards where practicable.

RECOMMENDATION 8.1 – AUSTRALIAN DESIGN RULES

The Australian Government should amend the Australian Design Rules (ADRs) and in-service vehicle standards to allow for new transport technologies, including automated technologies, with proven productivity or safety benefits. These amendments should aim to:

- achieve national and international consistency of laws and standards where practicable, and accept safety devices adopted in other leading economies as ‘deemed to comply’. In cases where the Government believes it would be unsafe to apply an international standard in Australia, it should provide evidence to support this view through a transparent review of the ADR, conducted within a defined timeframe
- address specific ADR issues identified as significantly hindering productivity or safety (such as safety technologies unable to be used due to width and mass limits).

8.2 Transport data

Digital technologies used in transport are generating ever greater volumes of data and expanding the potential uses of data in freight and logistics, and transport systems more broadly. The increased generation of transport data, combined with improvements in the tools used for its management and analysis, present opportunities.

Transport data come from a variety of sources. Data are created by vehicles, trains and vessels, as well as the supporting infrastructure, and external sources such as smart phones. Intelligent transport systems (ITS) collect, process, integrate, and sort these data to inform decisions and optimise the performance of traffic networks in real time (Australian Academy of Technology and Engineering 2019, p. 50). Governments need to explore the potential uses of big data in the transport sector and address challenges in data access, capture, storage and analysis (TIC 2016, p. 14). Ensuring effective privacy and security arrangements is also important, as operators will be more supportive of the use of ITS if the risks of inappropriate data access or misuse are addressed.

The issues assessed in this section relate to the creation and use of transport data, the implications for stakeholders in each transport mode, and the need for regulatory reform.

Sources and uses of transport data

Some emerging technologies are enabling transport data to be collected and used in new ways. For example, some relatively new sources of transport data include telematics and dedicated short range communications (DSRC).

- *Telematics* is the term used to describe long-distance transmission of computerised information (Australian Academy of Technology and Engineering 2019, p. 57). The use of telematics enables information about a vehicle, such as its location, speed, fuel consumption and condition to be wirelessly relayed to the vehicle's owner or an authorised third party.
- *DSRC* is a communications protocol that provides high speed, low latency communications from vehicle-to-vehicle (V2V), vehicle-to-infrastructure (V2I) and vehicle-to-other entities (V2X). DSRC can compete with, or complement 5G systems (Australian Academy of Technology and Engineering 2019, p. 49).

However, not all geospatial and logistical data are collected through in-vehicle telematics. For example, the NHVR monitors the heavy vehicle fleet using a series of monitoring cameras installed in various locations across Australia (NHVR 2020). Some government bodies also use data from non-traditional sources, such as smart phones, to collect transport data in a low-cost manner (Esri 2020). Combining data collected through different applications and devices (such as by linking longitude and latitude data) enables industry and government to select the data technology that best meets their needs.

These data can be used for many purposes, including:

- optimising freight routes and schedules. For example, using real-time information can help travellers or freight operators plan an efficient journey, including by facilitating optimal route selection, tracking freight consignments, and enabling efficient connections with public transport and access to transport related services like parking (TIC 2016, p. 11)
- congestion monitoring and management. For example, smart infrastructure, such as signals on motorway on-ramps or variable speed limits, can significantly improve traffic flows at relatively low cost (TIC 2016, p. 10)
- enabling the use of ITS and autonomous technologies. For example, better communications on railways can safely allow shorter following distances between trains (TIC 2016, p. 11)
- improving compliance and enforcement for regulators (chapter 9)
- improving record keeping and removing paperwork. For example, the use of automated electronic log books could remove the need for truck drivers to maintain written work diaries

- providing an evidence base for policymakers (chapter 10). For example, data can improve infrastructure planning and investment and operational decision making over the life of an asset (TIC 2016, p. 11)
- enabling and enforcing dynamic road pricing (chapter 10).

A range of new technologies trialling or implementing these uses of transport data are underway in Australia and overseas (box 8.3).

Box 8.3 Some examples of data-based transport technologies

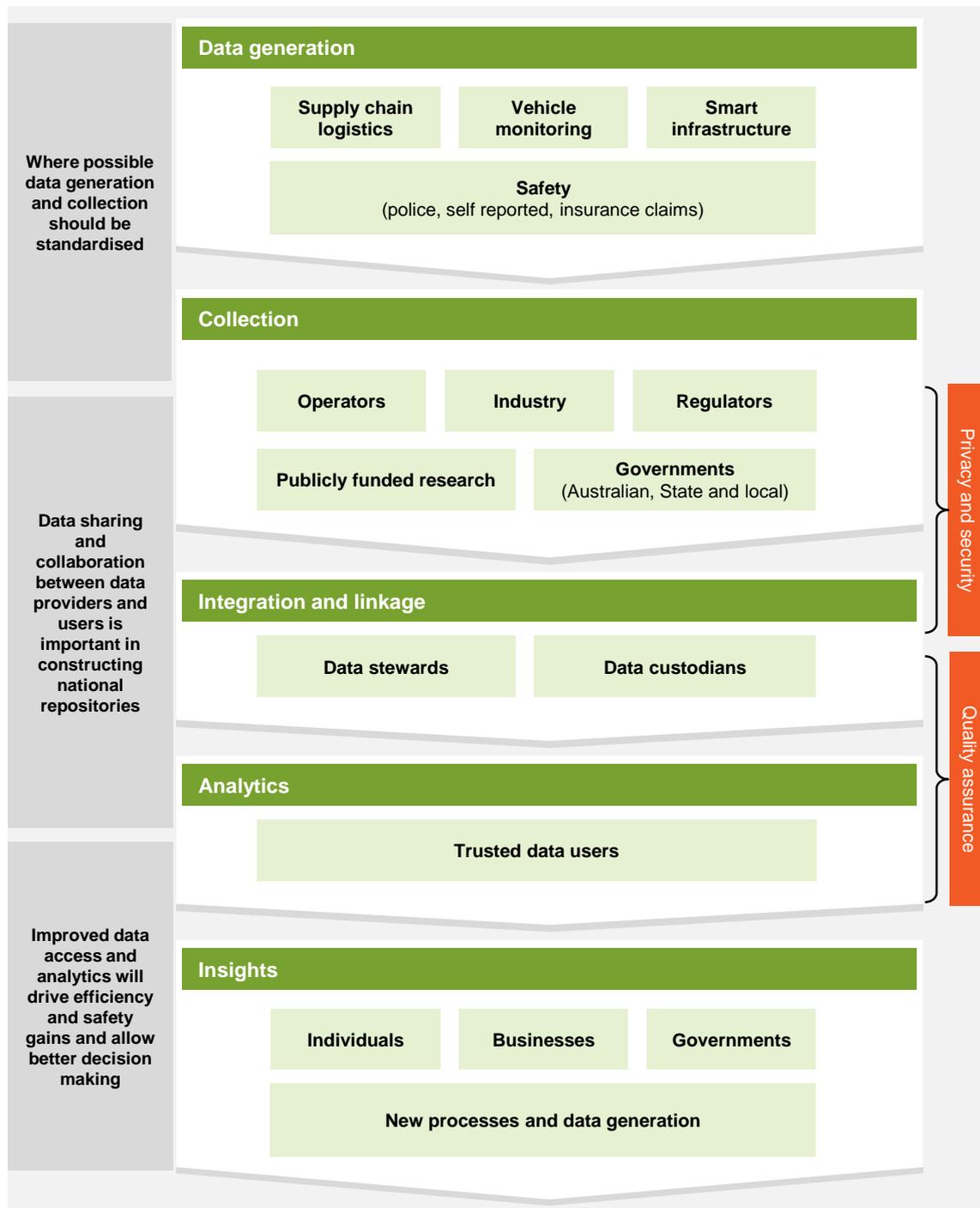
- Transport for NSW has established the Cooperative Intelligent Transport Initiative — one of the world's first large scale test projects of vehicle-to-vehicle and vehicle-to-infrastructure communications in heavy vehicles.
- The Cooperative and Automated Vehicles Initiative is running a large-scale pilot project of C-ITS in Queensland.
- A Victorian company, Eastern Plant Hire, operates a service whereby heavy vehicle owner-drivers can register their availability for transport tasks via a platform app. Uber operates a similar freight business in the United States, but not yet in Australia.
- Allianz has offered discounts on insurance premiums to 'good' European drivers based on data from real time monitoring and telematics. This approach was trialled with 80 000 vehicles.
- The Port of Fremantle uses a fully automated IT system with variable messaging signs to manage congestion. The Port also uses OneStop — a vehicle booking system for full containers that manages the available slots during the day via a compulsory app.
- The CSIRO has developed 'TraNSIT', which uses telematics to map millions of vehicle trips between production and domestic and export markets. For each supply chain path, it selects the least-cost travel path as well as vehicle configuration, accommodating road conditions, driver fatigue regulations and vehicle decoupling costs.
- The University of Melbourne developed the Australian Integrated Multimodal Ecosystem — a transport 'test bed area' incorporating 100 kilometres of road and containing up to 1000 sensors to collect data on vehicle and pedestrian movement and public transport use.
- Cubic Transportation Systems and Transport for NSW have signed a five-year contract for an Intelligent Congestion Management Program, designed to enhance Sydney's ability to manage its roads and public transport system.

Sources: Allianz (2019); Australian Academy of Technology and Engineering (2019); CSIRO (2019); Eastern Plant Hire (2019); Fitzgerald (2018); iMOVE (2017); ITS Australia (2017); Transport for NSW (2016).

Data collection and access

The Commission considered data access in the 2017 inquiry into Data Availability and Use. The inquiry found that improved data access and use can enable new products and services, drive efficiency and safety, create productivity gains and allow better decision making (PC 2017, p. 2). There are various policy challenges throughout the data life-cycle — from generation and collection through to its use. Such a life-cycle applies to data in the transport sector (figure 8.1).

Figure 8.1 The transport data life-cycle



The Australian Government has committed to releasing more non-sensitive public data to support private sector innovation, to improve service delivery, and to inform policy (Australian Government 2015), including the establishment of a Consumer Data Right in the banking and energy sectors (box 8.4). There may be potential to establish a similar framework for sharing data for the transport sector.

Box 8.4 **The Consumer Data Right**

The consumer data right (CDR) was announced by the Australian Government in November 2017, to enable consumers to access and safely transfer their banking data to trusted parties, so that they can benefit from its value. The CDR was designed to improve consumers' ability to compare and switch between products and services in the banking sector, and to encourage competition between service providers, in order to lower prices and encourage innovation. It was announced that the Australian Competition and Consumer Commission (ACCC), supported by the Office of the Australian Information Commissioner (OAIC), would develop the regulatory framework underpinning the CDR.

The CDR is intended to eventually become an economy-wide right, applied sector-by-sector where beneficial to do so, beginning in the banking, energy and telecommunications sectors. Future sectors subject to the CDR may be designated by the Treasurer based on advice from the ACCC and OAIC on the costs and benefits of including them.

Sources: ACCC (2018); Treasury (2018).

With heavy vehicles, data are generated from a range of sources, and collected by industry, the NHVR and other government bodies (figure 8.2).

Telematics and other forms of logistical data are being increasingly used by private operators. Although commercial data are often very rich, they are usually not available to third parties and markets for trading telematics data have not developed. For large trucking companies, the cost of real-time vehicle tracking is likely to be relatively low, and most logistics fleets would likely be tracked for commercial purposes. However, such data are likely to remain within each individual organisation, as there is little commercial incentive (and possibly a lack of commercial infrastructure) to share data. Similarly, some transport data collected by governments can remain confidential. In other areas of transport, significant data gaps exist. Data are also collected in an inconsistent, ad-hoc manner (chapter 7).

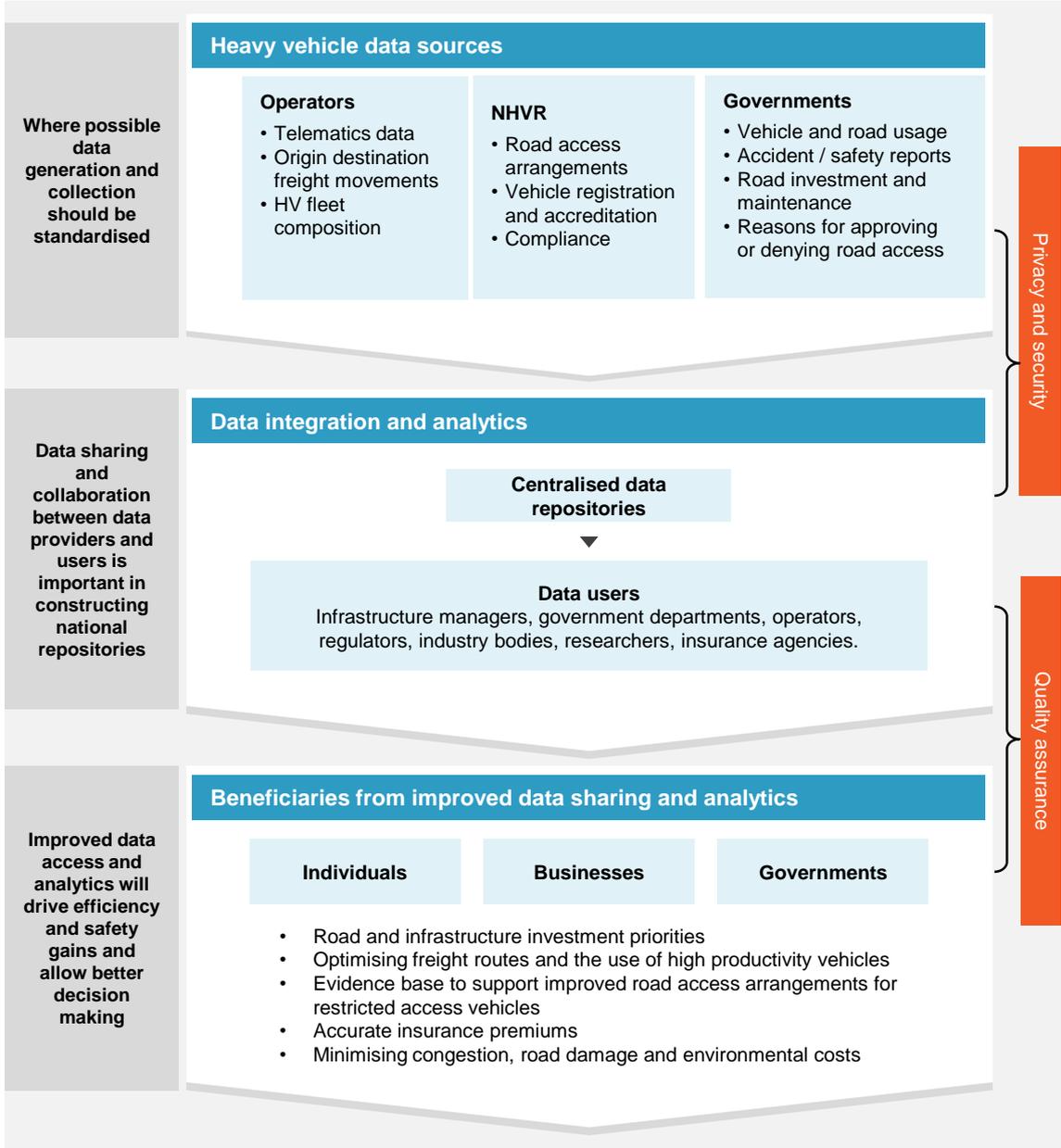
Heavy vehicle data are also collected by government bodies in various forms. For example:

- Transport Certification Australia (TCA) is responsible for providing assurance in the use of telematics and related intelligent technologies, and the collection and management of heavy vehicle data through the National Telematics Framework. The Framework is intended to provide a common digital business platform for transport operators, road managers, regulators, and other parties (TCA 2019)
- the NHVR collects compliance and monitoring data, including through the national safety camera network and compliance monitoring system (sub. DR72, p. 5)
- State and Territory Government transport departments collect heavy vehicle data in various forms, including vehicle registration data and road safety statistics.

In the 2019-20 Federal Budget, \$8.5 million was allocated to DITRDC for the creation of a National Freight Data Hub. This funding included \$5.2 million to settle the design of the Hub, and \$3.3 million to conduct a freight data exchange pilot and survey of road usage for

freight purposes to inform the process. Following the two year design phase, DITRDC will present the Australian Government with a business case for consideration.

Figure 8.2 Potential framework for the use of heavy vehicle data



While the precise design of the National Freight Data Hub is yet to be determined, DITRDC have described its purpose as to ‘enhance the collection of and access to freight data, across all modes’ to support operators, improve infrastructure decisions and enable evaluation of Australia’s freight system (DITRDC 2019).

By bringing transport data from some of these sources together into a central repository, the National Freight Data Hub has the potential to benefit a range of stakeholders. Access to a large, network-wide dataset as a common resource would maximise the benefits of ‘big data’, while protecting the confidentiality of individuals and businesses (much as the Australian Bureau of Statistics collects and publishes data but is committed to privacy).

This would enable such data to be used (subject to terms and conditions) by:

- private operators and logistics companies to improve record keeping, optimise transport routes across modes in real time, and gain insights into trends in unsafe behaviour such as speeding or harsh braking
- regulators, for monitoring compliance and enforcement of operators (but not for directly punishing drivers through automatic penalties) (chapter 9)
- infrastructure managers, for managing traffic flows, monitoring the condition of infrastructure to determine investment priorities, and to facilitate mass-distance charging (chapter 10)
- government bodies undertaking research or conducting technology trials
- other third parties, such as insurance companies rewarding drivers for driving safely (chapter 9).

Establishing the Hub will require the cooperation of all the parties outlined above. In addition to the sharing of data between data providers and users, collaboration is required when making the decisions needed to turn these data into useful information (for example, determining the technical definition of a heavy vehicle ‘trip’). This requires the setting of common data standards.

Successfully establishing a centralised national data repository is also dependent on the enforcement of a common data standard by an independent data custodian. Data standards are important to enable both dataset coherence (internal consistency and comparability) and interpretability (insightful information) (PC 2017, p. 160). Setting consistent data standards enables data from a wide variety of sources to be combined or linked, which will be highly important in facilitating a national approach to transport data collection and use. However, a central repository should also aim to enable access to primary, unmodified data (other than the de-identification process) where possible to enable flexibility for data users.

Encouraging the uptake of telematics

As outlined above, vehicle telematics can deliver significant productivity and safety benefits for a range of parties. However, some of these benefits, such as improved user charging and infrastructure planning, do not accrue to private parties. There may therefore be a role for government to encourage the uptake of telematics.

For example, smaller operators may lack the capability to collect or use telematics data. These operators may also have little incentive to do so, because the benefits of tracking and

optimising the use of a small fleet may be minimal. If there are positive externalities (that is, safety and/or productivity benefits) from all operators' data being available in a centralised manner, there could be a role for government to either subsidise the use of telematics or provide information and guidance to smaller operators.

Government policy can influence the adoption of telematics. The NTC (2018b, p. 3) has highlighted many mechanisms for accelerating the uptake and use of telematics, including: technology trials, awareness campaigns, adoption of technologies into vehicle and design standards, updating government fleets and through offering regulatory, financial and productivity incentives. In the heavy vehicle sector, various national initiatives encourage the use of telematics through the National Telematics Framework. These include the Intelligent Access Program, Intelligent Speed Compliance, On Board Mass Monitoring, Certified Telematics Service, Intelligent Speed Management and Electronic Work Diaries (ITS Australia 2017, p. 58).

TIC (2019) is exploring options for increasing the uptake of telematics and other technologies for regulatory and revenue collection purposes.

Highest value uses of data

Some of the parties listed above may only stand to benefit from one potential application of the National Freight Data Hub, or a particular form of data sharing. Data needs are also likely to vary significantly between transport modes, and across the diverse range of public and private sector users. It may therefore be infeasible or inefficient for the Hub to facilitate all of these potential functions.

Rather than attempting to create an all-encompassing data repository that fulfils the data needs of all parties from its inception, DITRDC should prioritise the highest value uses of data when developing the National Freight Data Hub. This approach could involve identifying and facilitating the most valuable data sharing applications in the short term, and then progressively expanding the applications of the Hub over time. The Commission has identified some data sharing applications with the potential to significantly improve productivity in the transport sector. These are described below.

Data for planning and managing road infrastructure

The improved collection of data on road users by infrastructure managers has the potential to significantly improve productivity in the transport industry. Data will help to establish an evidence base regarding the allocation between different infrastructure uses, to allow for more informed decisions by Government around infrastructure planning (chapter 10). Telematics and other freight data will enable infrastructure owners and managers to more easily analyse heavy vehicle movements, including past and projected trends, and to monitor the condition of key road assets and infrastructure.

Data have the potential to improve long-term planning and decision-making around road infrastructure investment, maintenance and renewal, as well as the planning and zoning of freight corridors and key freight routes across jurisdictional boundaries. Decisions made in these areas have a significant effect on long-term productivity (chapter 10).

This issue is discussed in more detail in chapter 10.

Data for regulatory purposes

As discussed above, transport data can be highly useful for regulators and governments. The NTC argued that:

A flexible approach to technology and data for regulatory purposes should facilitate innovative business practices, improve knowledge and encourage voluntary uptake of technology at a faster pace. (2019a, p. 49)

Some stakeholders argued that national regulators should play a larger role in the sharing, collection, management, and use of logistical data. One issue is whether each of the national regulators has access to all the data it requires to fulfil its role in safety regulation. For example, the Commission's report on Agriculture Regulation (PC 2016b, p. 363) highlighted significant information gaps faced by the NHVR relating to permit decisions, as some data were held by State and Territory regulators. The NHVR (2018, p. 3) also noted that its access to data on road accidents was limited.

Improving data sharing between road users and infrastructure managers to inform decision-making around the granting of permits and road access for heavy vehicles has the potential to generate significant productivity benefits (chapter 10). Data will provide local governments and asset owners with more information as to the number and size of the heavy vehicles operating on their roads, as well as the routes they take. Infrastructure managers could utilise heavy vehicle telematics data to make access decisions that lead to the most efficient use of a freight network, in a safe manner. Such data sharing could also enable infrastructure managers to provide incentives for operators to select particular transport routes, and could facilitate more outcomes-based regulation.

Transport data could also be used by government agencies for compliance and enforcement. There may be a need to increase the data access powers of regulators and enforcement agencies (such as police departments) so that they can adequately assess compliance with relevant regulations. Enhanced use of telematics could improve safety through improved monitoring, and potentially enforcement, of various safety requirements. Independent accident investigators such as the Australian Transport Safety Bureau (ATSB) would also require access to data in order to effectively undertake 'no blame' investigations into transport safety accidents. However, the potential for telematics to be used as a tool for compliance has reduced the uptake of the technology by operators (chapter 9).

There is a need for governments to establish data sharing frameworks in order to clarify the data access powers of regulators, enforcement agencies and accident investigation bodies,

while protecting privacy and confidentiality. Regulators should have access to data at an adequate level to monitor compliance. Accident investigators should have access to data to determine the cause of accidents in no blame investigations and, in some cases, the party responsible. These issues are discussed in more detail in chapter 9.

The Heavy Vehicle Road Reform agenda

The Australian Government is working to progress the Heavy Vehicle Road Reform agenda, in collaboration with industry and State, Territory and local governments. These reforms are designed to reframe the provision of heavy vehicle road infrastructure as an economic service, by establishing a market that better matches the supply and demand for roads and ‘links heavy vehicle user needs with the level of service they receive, the charges they pay and the investment of those charges back into heavy vehicle road services’ (TIC nd). The economic benefits from improved productivity due to these reforms have been estimated to range from \$6.5 to \$13.3 billion over the next 20 years (DIRDC 2018, p. 6).

To assist in the development and implementation of the Heavy Vehicle Road Reform agenda, DITRDC is undertaking the National Heavy Vehicle Charging Pilot. This pilot involves using telematics to collect data on the road use of participating operators, which is then used to calculate a ‘mock invoice’ based on distance travelled and vehicle configuration (DITRDC 2020).

This pilot project, and the implementation of Heavy Vehicle Road Reform more generally, depend on the sharing of logistical data between operators and governments. Given the substantial potential economic benefits of achieving efficient and adequate funding of road provision and maintenance, the Australian Government should aim to facilitate the forms of data sharing required to progress these reforms as a priority. Heavy Vehicle Road Reform is discussed in more detail in chapter 10.

Data privacy and security issues

A potential barrier to the widespread uptake of telematics and the use of data for regulatory purposes is the concern by some stakeholders that private or commercially-sensitive information will not be protected. In the 2017 inquiry into Data Availability and Use, the Commission argued that a ‘lack of trust by both data custodians and users in existing data access processes and protections and numerous hurdles to sharing and releasing data are choking the use and value of Australia’s data’ and identified improving trust community-wide as a key objective (PC 2017, p. 2). There may be a role for governments to establish rules regarding data access and use with respect to transport, including cyber security measures (box 8.5).

Box 8.5 Cyber security issues

Cyber security provides protection against unwanted access, control, damage, or theft of private digital property by unauthorized third parties and is critical to the successful implementation of many transport technologies, including data and analytics technologies.

The increasing creation and use of transport data is likely to bring increased cyber security risks. The interconnectedness of intelligent transport systems, such as vehicle-to-infrastructure and vehicle-to-vehicle communications, means that transport systems may become more vulnerable to cyber-attacks. Malicious algorithms and data discovery attacks are also expected to become more frequent. The manipulation of vehicles or transport network control systems by malicious third parties could result in potentially catastrophic outcomes for moving vehicles. Cyber security measures will therefore become increasingly important.

The Transport and Infrastructure Council (TIC) recommended the development of a ‘national deployment plan’ for security management of connected and automated vehicles by Australian, State and Territory governments in its *National Land Transport Technology Action Plan (2020–2023)*. TIC also identified a Security Credential Management System (SCMS) — a system that verifies transport devices — as a measure that has been used overseas and that could be used for telematics and C-ITS in Australia. Queensland Government trials of SCMS, and research into the potential use of SCMS by transport authorities by the iMOVE Cooperative Research Centre, are expected to be completed by 2022.

Regulators should ensure measures (including physical and digital firewalls) are established to limit potential harm, where it is practicable to do so. The Commission’s 2016 research study into digital disruption found that, while cyber security measures are important to protect citizens and facilitate trust, risk cannot be entirely eliminated, and it may not always be cost effective or socially desirable to do so. The business case for public cyber security investments should be properly scrutinised to ensure public money is delivering a net benefit.

Sources: Deloitte (2018); ITS Australia (2017); PC (2016a); TIC (2019).

During consultation for this inquiry, participants indicated that heavy vehicle drivers had expressed privacy concerns around the use of telematics ‘black boxes’ in their vehicles. TCA argued that freight operators have concerns around the use of telematics data for purposes other than statistical aggregation (Anderson et al. 2019, p. 44). There are some data privacy issues that are unique to transport and mobility. Deloitte argued that regulators should factor in the ability to track a person’s movement when considering privacy protections (2018, p. 13). According to ITS Australia (2017, p. 48):

It is critical that there is public acceptance that data sets about their personal travel are secure. To do this, we need to be transparent about why we need this data and what the benefits are to the individual as a result. This holds true for anonymised cellular data as well, which is now being widely used for travel information. While this data will likely be used for the next generation of traffic control systems, we need to be very careful in preserving individual privacy as we move into these areas.

When it comes to safeguarding the privacy of transport data, the interests of governments and the private sector may not be aligned. For example, some private transport operators not abiding by the national laws may benefit from a lack of transparency around their telematics data.

Privacy protections for transport data may also be inadequate in some areas. For example, there is no regulatory framework covering the handling of data created by autonomous technologies. This has led to uncertainty around how government agencies would access automated vehicle data (NTC 2016b, p. 9). Given the potential range of benefits of the widespread use of telematics, resolving privacy issues and providing clarity on how data are accessed and used by third parties will be critical.

FINDING 8.2 – GOVERNMENT ROLE IN TRANSPORT DATA

Transport data can be used by various parties for diverse purposes. Governments can best provide value by:

- facilitating the sharing of data by developing common data protocols and standards
- establishing regulatory frameworks for data collection, storage, analysis and access
- prioritising data uses with the highest value, such as data-sharing projects with the potential to significantly improve productivity in the transport sector.

RECOMMENDATION 8.2 – TRANSPORT DATA TO IMPROVE PRODUCTIVITY

Governments should prioritise the uses of data with the greatest potential to improve productivity in the transport sector. These include facilitating coordination between road users and infrastructure managers to:

- inform the provision and management of road infrastructure
- inform decisions around permits and road access for heavy vehicles
- assist in the development and implementation of the Heavy Vehicle Road Reform agenda.

The Australian Government should give priority to these uses of transport data when developing the National Freight Data Hub.

Implications for each mode

For the heavy vehicle sector, as a first step, governments should identify opportunities for data sharing that can be achieved at low cost, in the short term. For example, the National Freight Data Hub could initially provide a central repository for publicly available transport data collected by governments, similar to the approach taken in the creation of the New South Wales Freight Data Hub (Transport for NSW 2019), at a national scale. Industry, regulators and other government bodies should then co-operate in the establishment of the National Freight Data Hub, with priority given to the uses of transport data with the greatest potential to improve productivity, as outlined above. If implemented successfully, the Hub will allow for improved data access and analytics in the heavy vehicle sector.

For the rail sector, ONRSR is developing the National Rail Safety Data Strategy in collaboration with the Australasian Rail Association and rail industry representatives to ‘achieve relevant, consistent and quality national rail safety data that is readily available to stakeholders’ (ONRSR, sub. 21, p. 6). One unresolved issue relates to the confidentiality of information in the Rail Safety National Law. Section 244 of the Rail Safety National Law prohibits ONRSR from disclosing information identifying a person without consent. This inhibits ONRSR’s ability to share learnings from investigations and other relevant data with the wider rail industry. ONRSR is reviewing this section of the Act as part of the National Rail Safety Data Strategy.

For the maritime sector, AMSA became solely responsible for managing the data of the national system in 2018. Previously, AMSA received data from State and Territory regulatory bodies but this information was often of poor quality and incomplete. AMSA has said it is working to address data gaps as a priority (AMSA, sub. 35, p. 8), and removing grandfathered exemptions from vessel survey requirements will assist AMSA in this process (chapter 5). There may also be scope to expand the use of maritime data beyond regulatory purposes, such as for use by the fishing industry or for environmental purposes.

8.3 Automation

Automation has been used in the transport sector in a variety of ways, and further automation has the potential to generate large productivity, safety and environmental benefits. However, automation also presents new challenges, including new safety risks.

Automation in the transport sector

Autonomous technologies have the capability to respond to real world conditions without human assistance. Such technologies have the potential to disrupt all modes of passenger and freight transport, and are already having an impact in Australia and overseas (box 8.6). However, there is not a binary choice between person-controlled and fully autonomous technologies — technologies can also incorporate a range of semi-autonomous functions, and autonomous features have existed for many years, such as autopilots on aircraft. These functions range from autonomous braking and lane-changing features (already available in some new vehicles), to fully driverless operation.

The ‘level’ of automation for road vehicles can be defined according to the SAE International Standard J3016, which outlines six levels of driver automation (figure 8.3). Similarly, the International Maritime Organisation (2018) has defined four degrees of maritime autonomy, including: automated processes and decision support, remotely controlled ships with crew on board, remotely controlled ships without crew on board and fully autonomous ships.

Box 8.6 Some examples of autonomous transport technologies

In the *heavy vehicle* sector:

- BHP, Fortescue and Rio Tinto have operated fully autonomous trucks on various mining sites in the Pilbara for over five years
- start-up Embark uses fully autonomous heavy vehicles (with human supervision) to deliver commercial freight in the United States via the ‘longest automated freight route in the world’
- manufacturers including Daimler and Volvo participated in ‘European Truck Platooning Challenges’ in 2016 and 2019, successfully using autonomous platooning technology across various European transport routes
- Trials of autonomous shuttle buses have occurred in various Australian states and territories, including at the Tonsley Innovation District in South Australia and Kangara Waters retirement village in the ACT.

In the *rail* sector:

- Rio Tinto established the first automated heavy-haul long distance rail network in the world in the Pilbara in 2018
- the Sydney Metro driverless passenger train commenced operation in 2019.

In the *maritime* sector:

- various small autonomous vessels are being used in Australia for surveying by the military, oil and gas industry and surveying companies
- Rolls-Royce and towage operator Svitzer developed a remotely operated tugboat, which operates commercially in Denmark
- Yara Birkeland is the world’s first autonomous and zero-emission container vessel, scheduled to commence operation in Norway in 2020.

In warehousing and freight handling more broadly:

- Autostrads — driverless machines that move shipping containers between cranes, trucks and container stacks — were rolled out by Patrick at its terminals at the Port of Brisbane (commencing in 2005) and more recently at Port Botany (2015)
- Toll has an ‘Advanced Retail and eCommerce Fulfilment Centre’ in Prestons New South Wales with a fleet of fully autonomous forklifts
- in the United Kingdom, XPO Logistics is creating a ‘warehouse of the future’ with collaborative robots, an advanced sorting system, and indoor drones.

Sources: AMSA (2017); Embark Trucks (2019); France-Press (2016); Gleeson (2019); Henderson (2018); Jervis-Bardy (2019); PC (2016a); Rio Tinto (2014); Rio Tinto (2018); Sanda (2019); Tonsley (2018); Toll (nd).

Some major vehicle manufacturers expect vehicles capable of fully autonomous driving (SAE level 3 or above) to become commercially available by 2021 (figure 8.4). However, it is uncertain when such models will be made available in the Australian market, and when they will become a mainstream product offering (NTC 2019c).

While the regulation of automated technology is in its early days, tensions are already emerging between traditional public governance structures and the code-based decision making processes of automated technology (OECD 2019). Governments need to ensure regulatory frameworks are designed to ensure safety without imposing unnecessary regulatory burden or stifling productivity- and safety-enhancing innovation.

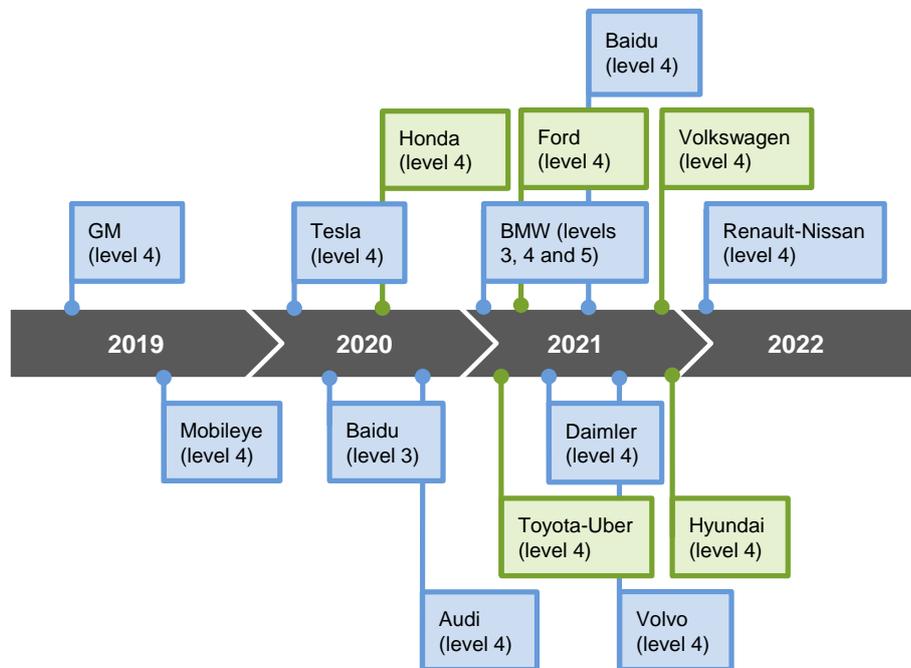
Figure 8.3 SAE J3016 levels of driving automation

	SAE Level 0	SAE Level 1	SAE Level 2	SAE Level 3	SAE Level 4	SAE Level 5
What does the human have to do?	You are driving when these features are engaged – even if you are not using the pedals or steering.			You are not driving when these features are engaged – even if you are in the “driver’s seat”.		
	You must constantly supervise these features. You must steer, brake or accelerate as needed.			You must drive when requested	These features will not require you to take over driving	
	These are “ driver support ” features			These are “ automated driving ” features		
What do these features do?	Provide warnings and momentary assistance	Provide steering OR acceleration/brake support	Provide steering AND acceleration/brake support	Can drive the vehicle under limited conditions. Will not operate unless required conditions are met.		Can drive the vehicle under all conditions
Examples	Automatic emergency braking, blind spot warning	Lane centring OR adaptive cruise control	Lane centring AND adaptive cruise control at the same time	Traffic jam chauffeur	Local driverless taxi, possibly with no pedals/steering wheel	Same as level 4, but operates everywhere in all conditions

Source: SAE International (2019).

Figure 8.4 Automated vehicles timeline

Based on manufacturer’s predicted release of automated vehicles



Source: NTC (2019c, p. 103).

Potential benefits of automation

Automation offers many productivity benefits. Removing the need for human operators will reduce some labour costs and eliminate the need for fatigue management. Automation also enables vehicles to travel closer together, and to use ITS to automatically find optimal routes. Communications between connected vehicles and road-side infrastructure could allow traffic management to be optimised, reducing congestion and pollution. Automated vehicles could also be summoned on-demand for more convenient first and last mile trips (DIRD 2017, p. 18).

Automation also offers several potential safety benefits. For example, automation can be expected to significantly reduce or eliminate safety risks caused by human error. Autonomous vehicles may be better able to drive within the speed limit, have faster reaction time for braking in the presence of an obstacle, and eliminate distracted driving and impaired driving caused by alcohol or other drugs (City of Melbourne 2016, p. 21). Fully autonomous vehicles could dramatically reduce the number of accidents caused by driver inattention or error. According to TIC (2016, p. 10):

[Autonomous emergency braking] is estimated to prevent 20–40 per cent of certain crashes. In the future, higher levels of automation, including vehicles that require no human control, may significantly reduce the number of road deaths, potentially by as much as 80 or 90 per cent.

Industry groups estimate that the economic benefits to Australia of introducing autonomous road vehicles alone could be as high as \$95 billion per annum — with the total ‘avoidable costs’ from crashes and congestion equal to around \$80 billion (ADVI 2019).

There are clear safety benefits from removing people from dangerous work environments. In 2017, the transport sector accounted for the highest number of worker fatalities (Safe Work Australia 2017) (chapter 6), and therefore automating part or all of the high-risk task could provide significant benefits. Automation also provides the ability to respond to hazards instantaneously, and enables a quicker response when safety incidents do occur. For example, ‘eCall’ is an autonomous feature (mandatory in all new cars sold within the European Union from April 2018) that automatically notifies emergency services when a vehicle has been involved in an accident (European Commission 2015).

Autonomous transport technologies may also provide social benefits, such as improved mobility for those unable to operate non-autonomous vehicles (including the young, some elderly people and some people with a disability). This will become increasingly important as Australia’s population ages and lives longer, and the number of non-drivers grows (TIC 2016, p. 13).

Potential costs and risks of automation

Automation creates some new safety risks. For example, autonomous systems can fail, and international experience suggests that some significant public safety issues exist during the trial phase and early adoption, when technologies and protocols are still being developed.

The safety results for autonomous road vehicles have been mixed so far. Uber has had considerably more incidents requiring human intervention than other companies, with trials showing that their cars required human intervention at least once for every mile driven while Waymo and Cruise were able to drive thousands of miles before intervention was needed (Myles 2019; Wakabayashi 2018). The number of collisions due to autonomous trial vehicles in the United States is increasing over time as more trials are undertaken (Myles 2019). Some fatalities involving (level 3) autonomous vehicles operated by Tesla have occurred in recent years, while a (level 4) autonomous vehicle trial undertaken by Uber resulted in the first pedestrian fatality caused by an autonomous vehicle (Schmelzer 2019).¹⁰

Autonomous technologies can also bring some new safety risks, even when operating effectively. For example, Google research suggests that, in semi-autonomous vehicles, drivers can be inattentive and not ready to resume control when required due to ‘passive fatigue’ and distraction (PC 2016a, p. 181). This is consistent with an experiment involving Volvo employees, which found that only a third of drivers applied emergency brakes promptly when in an emergency situation (Victor et al. 2018). Similarly, a trial in Canberra found that reaction times more than doubled when the autonomous function was engaged (NTC 2019c, p. 29). Through consultation with heavy vehicle operators, the Commission heard that autonomous braking has caused some problems (such as seatbelt injuries) by activating unexpectedly or without cause and that drivers have reported a loss of ‘feel’ as heavy vehicles have become more automated.

As discussed above, autonomous technologies rely on connected networks, sensors and telecommunications, and are therefore potentially vulnerable to cyber security risks.

Automated technologies can be disruptive to existing industries and may lead to some job displacement. Increasing automation is likely to create some new, highly technical jobs but may also displace some low and medium skilled jobs (PC 2016a). The Commission heard from heavy vehicle operators that, while truck drivers may require some additional training to work with autonomous technologies, human operators will continue to be important for undertaking non-driving tasks (such as loading freight and interacting with customers). Some maritime operators have made similar arguments regarding autonomous vessels (NFAS 2019). Despite a reduction in average crew sizes, having a crew on board is likely to remain important for particular tasks, such as assisting passengers in emergency situations.

Regulation of autonomous technologies

Autonomous transport technologies create a range of challenges for governments. Some existing regulatory and legal frameworks do not adequately provide for the safe operation of autonomous technologies, and these technologies may introduce new safety risks that will not be eliminated by market forces (NTC 2019c, p. 33).

¹⁰ In March 2018, an autonomous vehicle with a human emergency driver behind the wheel struck and killed a pedestrian who stepped onto the road while walking a bike. Uber and other companies temporarily suspended autonomous vehicle testing following the incident, and Uber’s trials remain ‘dramatically reduced’ (ABC News 2019).

Transport regulations may be required to recognise algorithms or autonomous pieces of equipment as entities in their own right (that is, as the driver), and algorithms will need to be coded to comply with transport regulations. Governments must also consider carefully how to approach the quality assurance task, to ensure adequately safe designs. Even with regard to lower levels of automation, there may be complications around determining legal liability when autonomous driving systems breach legislation or cause harm.

There is also risk in excessive regulatory caution. It is possible for regulatory barriers to impede Australia’s progress in adopting autonomous vehicles, potentially to the detriment of overall safety outcomes. Governments will need to design regulatory frameworks that ensure safety without imposing unnecessary regulatory burden or stifling productivity-enhancing innovation. A range of policy research and work is underway, particularly regarding the regulation of driverless vehicles (table 8.1).

Table 8.1 Current policy research and initiatives for autonomous vehicles

<i>Stage</i>	<i>Initiative</i>	<i>Owner</i>	<i>Status</i>
Import and manufacture	Harmonisation with UN vehicle standards	Australian Government	Ongoing
	Safety criteria for first supply of automated vehicles	Australian Government	Ongoing
Registration and licencing	Framework for registration and licencing of automated vehicles	Austrroads	Ongoing
	Integrating advanced driver assistance systems in driver education	Austrroads	Ongoing
On the road	In-service safety for automated vehicles	NTC	Ongoing
	Operation of automated heavy vehicles in remote and regional areas	Austrroads	Complete
	National enforcement guidelines for automated vehicles	NTC	Complete
	Regulating government access to C-ITS and automated vehicle data	NTC	Complete
	Review of motor accident injury insurance and automated vehicles	NTC	Ongoing
Infrastructure	Infrastructure for automated vehicles: freeways and highways, traffic signs, line markings	Austrroads	Ongoing
	Road authority data for connected and automated vehicles	Austrroads	Ongoing

Source: NTC (2019c).

Regulation of algorithms

Governments and regulators will be required to assess the safety of transport technologies that are fully or partly reliant on algorithms to operate. When assessing the safety of an autonomous technology for registration, there may be a need to examine the software as well as the physical state of the technology as with ‘traditional’ registration checks.

However, there may be challenges in determining the adequacy of the algorithms underpinning automated technology. Automation relies on algorithms, which can be designed to constantly update based on new data (through machine learning). If a regulatory agency approves the use of a particular autonomous technology, the underlying code may evolve over time and become entirely different to the initially approved code (OECD 2019). Code is also often created in environments that are not open to scrutiny and, over time, algorithms may become increasingly complex, preventing regulatory agencies (and the wider population) from assessing their function (OECD 2019). It may be difficult to predict how a machine learning algorithm will respond to a new environment, or to data in a form it did not encounter during development or testing. These issues pose a challenge to both manufacturers and regulators.

The Organisation for Economic Co-operation and Development (2019) has released a report on governing transport algorithms, which contains a number of recommendations, including:

- making policy ‘algorithm-ready’ and transport policy makers ‘algorithmically-literate’
- using algorithmic systems to regulate more dynamically and efficiently
- ensuring that oversight and control of algorithms is proportional to impacts and risks
- ensuring that potentially impactful algorithms can be easily audited and converting analogue regulations into machine-readable code
- establishing robust regulatory frameworks that ensure accountability for decisions taken by algorithms. These should ensure that algorithmic systems are conceived and built in such a way that they can be trusted to operate as intended. Those responsible for deploying the algorithmic system should be legally accountable for its decisions
- establishing clear guidelines and regulatory action to assess the impact of algorithmic decision making, and compare performance with human decision making.

One potential solution could involve certifying the ‘behaviour’ of an autonomous system through a process of practical testing, rather than attempting to certify the complex underlying code. As a first step, regulators should identify the risks posed by the use of algorithms in transport technologies, and should employ staff who possess the relevant skills to enable the assessment of algorithms and autonomous transport systems.

Road rules and licencing

Automation means that human operators are no longer wholly in control of a transport technology or the underlying decision-making process. This has implications for the traditional rights and responsibilities held by transport operators and manufacturers. For example, various legislative changes may be required to enable the legal operation of autonomous technologies. More than 50 Commonwealth and State legislative changes would be required to enable driverless vehicles to operate on Australian roads (NRMA 2017).

Australian road rules assume a human driver, and the NTC released a policy paper on *Changing driving laws to support automated vehicles* in May 2018. Drivers' licencing schemes will also need to change. Autonomous transport technologies require different skills to operate, and 'traditional' drivers/operators licenses do not reflect this. Governments will need to specify cases where traditional licenses are not required, and how licences for autonomous vehicle passengers will differ from traditional drivers' licences. Austroads explored some potential options in their report on *Registration, Licensing and CTP Insurance Issues Associated with Automated Vehicles* (Austroads 2017).

Accidents involving autonomous technology

There are community concerns around the safety of some autonomous technologies¹¹, and the potential ethical issues around how fully autonomous vehicles would respond in emergency situations (PC 2016a, p. 181). These issues revolve around how algorithms will make decisions involving moral judgments, such as the weight placed on the safety of vehicle passengers compared to other road users. There may be a case to regulate these algorithms to ensure they reflect community values.

There are also unresolved questions around legal liability when autonomous driving systems breach legislation or cause harm. In the case of a fully autonomous technology, it may no longer make sense for the occupant of a vehicle to be held legally liable for an accident. In such cases, liability may instead lie with the manufacturer, who is responsible for the design and safe operation of the automated system. This problem could be addressed by the introduction of a general safety duty (discussed below).

Insurance policies that assume a human driver today will also need to change. The United Kingdom has already made legislative changes to address some of the issues around insuring automated vehicles, through the *Automated and Electric Vehicles Act (2018)*. Section 4 of this Act provides that insurers may exclude or limit the insurer's liability arising as a result of software alterations made by or with the knowledge of the insured which are prohibited under the terms of the policy, and the insured's failure to install safety-critical software updates that the insured 'knows, or ought reasonably to know, are safety-critical'. The NTC is considering options for the insurance of autonomous driving systems (NTC 2018a).

Agencies responsible for investigating accidents involving autonomous technologies will need to determine the extent to which an accident was caused by an operator or by an issue with an autonomous system or its manufacture. An investigator would likely require highly specialised knowledge, and access to relevant data. There may be a case for expanding the role of ATSB to investigate accidents involving autonomous vehicles (chapter 9).

¹¹ A poll conducted by Roy Morgan (2017) found that only 46 per cent of Australians would be willing to travel in an automated vehicle. Responses varied significantly with age, with 83 per cent of 18-24 year olds indicating willingness to travel in a driverless car compared with 27 per cent of those aged 65 and over.

Trials and early adopters

Different regulatory approaches are needed for different stages in the roll-out of autonomous technologies and different levels of automation. Regulation should be adaptive and responsive to changes in the relevant industry and technological advancements over time.

Trials

While much of the expected productivity benefit of automation is likely to be associated with mature technologies, international experience suggests that some significant public-safety issues exist during the trial phase and early adoption, when technologies and protocols are still in development (Merkel 2018). At the same time, these early phases are key in ensuring investment in such technologies and associated infrastructure.

Various States and Territories have undertaken autonomous vehicle trials under State legislation (box 8.6). South Australia was the first Australian jurisdiction to introduce legislation for facilitating autonomous vehicle trials, although explicit legislation is not necessary to facilitate trials (PC 2016a, p. 186). The NTC identified the potential for inconsistent conditions for on-road trials across jurisdictions as an issue and proposed a set of national guidelines to support a consistent approach. Rather than embedding trial requirements in legislation, the guidelines provide a performance-based framework that ‘supports innovation and gives certainty to governments and industry’ (NTC 2017, p. 3).

By developing these guidelines, the NTC aims to make Australia a ‘global testbed’ for automated vehicles (NTC 2017, p. 3). A potential risk is that jurisdictions could compete in a ‘race to the bottom’ to have the most lenient regulations in order to attract investment. This has implications for public safety.

Regulation of partially automated technologies

Applications such as mining, freight handling and rail offer relatively immediate scope for the adoption of autonomous transport technologies. By contrast, fully autonomous heavy vehicles on public roads are potentially many decades from implementation due to the technology, the state of infrastructure, social acceptability and regulatory impediments (NTC 2016a). However, there is not a binary choice between driver-controlled vehicles and fully autonomous ones — vehicles can also incorporate semi-autonomous functions that automate parts of the driving task.

Clarity is needed around the regulation of partially-automated technologies. In the heavy vehicle space, Australian regulations can enable vehicles with partial or conditional automation, but rules around ‘control’ of the vehicle are unclear (NTC 2016b). For instance, it is unclear who is in control of an automated vehicle when the human driver must monitor the automated driving system and intervene if requested. The current interpretation by enforcement agencies of ‘proper control’ requires a human driver to have at least one hand

on the steering wheel, however this interpretation is likely to become outdated as autonomous technology improves (NTC 2016b, p. 8).

Different regulatory approaches will be required for different stages in the development and roll-out of some autonomous technologies. As discussed above, the ‘trial phase’ will be important for collecting data and determining how technologies work in practice, but raises unique regulatory issues due to the imposition of public risk. Early adopters of autonomous or partially-autonomous technology will also face some unique challenges. These users will likely be required to operate in environments that involve interactions with users of non-autonomous technologies, and associated safety risks (for example, autonomous heavy vehicles operating on highways with non-autonomous vehicles). Governments should not regulate too early — which could create artificial barriers to emerging technologies — or regulate too late and stop proven safety related technologies from being deployed. There is a need for a phased and flexible reform program (NTC 2016b).

General safety duty

The NTC released a consultation paper on *In-service safety for automated vehicles* as part of its reform program to enable the uptake of autonomous vehicles in Australia (NTC 2019c). In this paper, the NTC put forward a range of possible options for the regulation of autonomous road vehicles, including a new in-service general safety duty enforced by a single national regulator through State or Territory applied law.

Such a law would impose an overarching and positive duty on Autonomous Driving System Entities¹² (ADSEs) to ensure the safety of autonomous vehicles so far as reasonably practicable. The duty could also apply to an ADSE’s executive officers, and potentially repairers of autonomous vehicles. In order to satisfy the duty, an ADSE must show it has established systems to respond to safety risks. Such systems could involve policies to ensure the quick detection of software errors, or mechanisms preventing an autonomous vehicle from operating when it is unsafe to do so. A statutory safety duty could help to:

- ‘codify’ duties against negligence into legislation, and attach a criminal sanction for breaching the duty
- provide greater clarity about what constitutes negligence in the context of automated vehicle regulation
- allow regulators to monitor compliance and enforce the duty in a proactive manner.

General safety duties can be efficient and effective, because parties have both the freedom and incentive to innovate. They can solve safety risks particular to their role, rather than needing to comply with prescriptive rules far removed from the risk itself. A general safety duty would also ensure that in-service safety risks and hazards that are not identified through

¹² An ADSE is a legal entity that certifies that an Automated Driving System (ADS) can safely perform the driving task in place of a human driver. Under the proposed NTC scheme, an ADSE will self-nominate by seeking type approval for the ADS under the *Road Vehicle Standards Act 2018* (Cwlth) (NTC 2019c).

the safety assurance system process are managed, and that unsafe behaviours that are not otherwise captured by prescribed offences are prevented.

The Commission considers that a general safety duty (like the approach adopted by workplace health and safety legislation) should apply to all parties with a significant influence over the safety of the operation of an autonomous transport technology. Such parties would include manufacturers, users and potentially repairers and maintenance and service providers of automated transport technologies.

However, it may be desirable for such a safety duty to be supported by some more prescriptive rules around various aspects of autonomous operations. Prescriptive regulations can be effective when they do not interfere with innovation, and when a high degree of standardisation is preferred (NTC 2019c, p. 88). For example, there may be benefits in maintaining existing rules around high-risk activities such as the transportation of dangerous goods, as well as drug and blood alcohol laws for users of autonomous technologies operating at level 4 and below.

RECOMMENDATION 8.3 – GENERAL SAFETY DUTY

The Australian Government should impose a general safety duty on all parties with a significant influence over the safe operation of autonomous transport technologies. The creation of a general safety duty should not preclude the use of prescriptive rules where the assessed risks are high.

Implications for each mode

Different regulatory approaches will also be required for different modes and functions of autonomous technologies. For instance, autonomous trains operate in highly controlled environments and autonomous maritime vessels often operate in environments involving little interaction with other vessels or the general public. Each of these technologies are likely to involve less risk than autonomous heavy vehicles operating in highly complex environments and among many non-autonomous vehicles and pedestrians.

Heavy vehicles

For the heavy vehicle sector, many laws and regulations will need to change to accommodate increasing automation. Some of these changes are being considered by the NTC and could be incorporated as part of the HVNL review (NTC 2019b).

In November 2018, the NTC recommended that a safety assurance system for automated driving systems be administered by a government authority, preferably on a national basis. Approval decisions could be made on the advice of a single national government panel consisting of Australian, State, and Territory Governments, the NTC, the NHVR and Austroads (NTC 2018c).

In November 2016, Australian transport ministers agreed to a phased program so that ‘conditionally automated vehicles’ (with a supervising human driver) could operate safely and legally before 2020, while highly and fully automated vehicles could do likewise from 2020. In addition, DITRDC is leading the *National Land Transport Technology Action Plan*, which aims in part to keep ADRs relating to automated vehicles up to date with international standards.

Rail

For the rail sector, the NTC found that there are no regulatory barriers to automated rail (including light rail) in Australia (NTC 2016b). ONRSR approved an autonomous freight rail system used by Rio Tinto on a private network in 2018 (Sonder 2018). Given that this train operates on a private rail network, the productivity benefits are captured by the owner of the network, and any risks to community safety are relatively contained. Similar technology has been used for the development of autonomous passenger trains for the Sydney Metro, which commenced operation in 2019 (Sanda 2019; Wiggins 2018).

ONRSR (sub. 21, p. 45) argued that its co-regulatory arrangements already accommodate for new technologies as seen with the recent introduction of driverless trains. As it is a risk-based model, new technologies can be assessed, with risks identified and managed with rules, processes and procedures, supported by training and development. The current regulatory arrangements for rail therefore appear acceptable for managing the risks of emerging, autonomous technologies.

Maritime

For domestic commercial shipping, there may be some regulatory barriers to the introduction of autonomous vessels. The International Maritime Organisation (2019) is conducting a regulatory scoping exercise to determine whether existing regulatory settings are appropriate for autonomous vessels, and has approved some interim guidelines to facilitate trialling of the technology.

AMSA (2017, p. 19) has identified a number of unresolved technical and regulatory issues including mandating collision avoidance technology, enabling remote or automated operation of switches, valves and other controls, and other issues around autonomous vessel design, registration, certification and operation. AMSA’s current approach is to assess autonomous vessels on a case-by-case basis, and grant regulatory exemptions where the technology is deemed safe. This approach appears to be operating well, but it will need to change when the number, size and complexity of autonomous vessels increase.

In the short term, AMSA should aim to enable trials of autonomous vessel technologies in order to build an evidence base and inform how regulations should change. There may be scope to use a ‘regulatory sandbox’ approach (chapter 9) to enable the safe testing of innovative technologies and facilitate mutual learning by regulators and operators.

9 Further reforms to improve transport safety

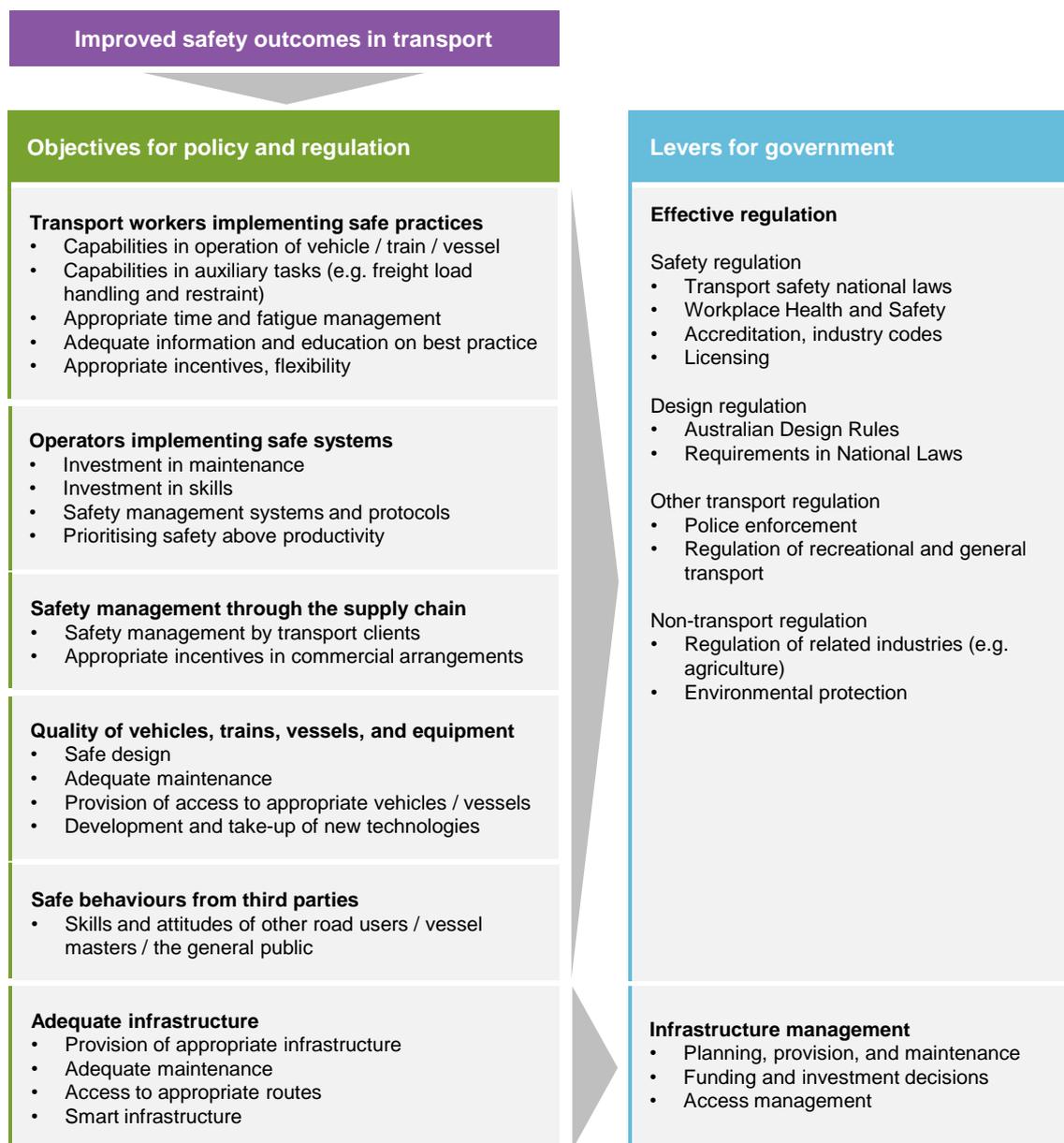
Key points

- The role of government in influencing transport safety outcomes is much broader than the national regimes for safety regulation.
 - Policy, regulation, culture and technology all influence safety outcomes.
 - A ‘system-wide’ view is needed when considering how to improve safety in the three modes of transport.
- The transition to national regimes for heavy vehicles, rail, and domestic commercial vessels is nearly complete. Significant contributions to safety can be achieved through further reform of safety regulation, in the form of logical incrementalism. Reforms should focus on:
 - making safety regulation more adaptable to change, to reflect contemporary evidence — particularly in heavy vehicle regulation
 - allowing enough flexibility and innovation and promoting a stronger safety culture in industry, ensuring that industry focuses on safety rather than compliance.
- Safety outcomes will continue to be influenced by commercial decisions on how freight is transported, including choices of mode, route, vehicle, and the extent of technological adoption. In this sense, safety would improve as a result of:
 - efficient road access regimes that allow safer technologies to be used where infrastructure can accommodate them
 - efficient provision and management of infrastructure, including road user charging.
- Policy should be neutral to the mode of transport so that competition leads to optimal outcomes for the community.
 - Achieving allocative efficiency between the modes of freight transport requires consideration of many factors, including those relating to productivity (discussed in chapter 10) and those related to ensuring high levels of safety.
- Telematics and other forms of data can be harnessed to improve decision making and incentives for safety. Safety outcomes stand to benefit from greater use of data by transport operators, regulators, and insurers.
- The full potential of incident investigation has not been realised in road, rail, or maritime transport. The Australian Transport Safety Bureau should be given the responsibility and resources to conduct no-blame investigations in all three modes.

9.1 Introduction

Transport safety outcomes are determined by many factors, including the actions of transport workers; the decisions of transport operators; the functioning of the supply chain; the behaviours of people outside the transport industry, including the general public; the state of equipment; and the adequacy of infrastructure. While the 2009 COAG reforms focused on establishing national regulatory regimes, governments have a broader influence on safety (figure 9.1).

Figure 9.1 Policy objectives and levers to improve safety outcomes



With national laws and regulators now established, the logical next step for policy makers and regulators is incremental improvement of the regimes, often referred to as ‘regulatory stewardship’. This chapter outlines a broad, new agenda for governments and regulators to improve safety, including the evolution of safety regulation in the transport sector (section 9.2); supporting safer choices of freight routes and equipment (section 9.3); harnessing data to improve safety (section 9.4); and improving incident investigation (section 9.5).

9.2 Evolution of transport safety regulation

As discussed in chapter 2, regulation can have elements of prescription and outcomes-based approaches, as well as risk-based approaches to enforcement, compliance, and general resource allocation (box 9.1). Many submissions to this inquiry discussed the advantages and disadvantages of different approaches to regulation, in response to questions posed in the issues paper for this inquiry (box 9.2).

Box 9.1 Different approaches to safety regulation

Prescriptive approaches to regulation impose specific requirements on the operations of regulated parties. An example in heavy vehicle safety is regulations that prescribe the maximum mass of various types of heavy vehicles, with penalties for operating over the prescribed mass.

A more flexible approach to regulation involves defining the outcome the regulator is seeking to achieve without specifying the measures that regulated parties must take to achieve the outcome. Outcomes are defined at a high level and in a way that lets regulated parties choose how to meet the objective. One way for regulated parties to demonstrate compliance with regulatory objectives is by becoming accredited. To maintain confidence in accreditation systems, regulators also monitor their effects on safety outcomes.

One approach to regulating a diverse group of operators is a tiered system. Under this approach, operators are subject to overarching safety obligations, and can choose how to achieve them.

- Regulators would publish ‘acceptable means of compliance’ — work practices and technologies that are deemed to achieve the high-level safety objectives.
- Transport operators could choose to not use the ‘acceptable means of compliance’ if they were able to demonstrate that they have systems for managing safety risks that are at least as safe as the acceptable means. Operators would be required to have their safety management systems accredited by the relevant regulator (at the operator’s expense).

In addition, risk-based approaches to safety regulation allow regulators to deploy resources in proportion to the risk or outcomes to be achieved. Regulators can then tailor their service delivery and administration so that compliance costs are commensurate with risks.

Box 9.2 Stakeholder views on approaches to regulation

Several stakeholders commented on the various approaches to regulation that have been implemented by the national safety regulators.

It is important to note that the [Rail Tram and Bus Union] does not support a total reliance on prescriptive rules. Rather, prescriptive rules are simply the building blocks for developing and maintaining a strong safety culture – specifically a safety culture that fosters positive and collaborative relationships between workers and their employers. (Rail Tram and Bus Union, sub. 10, p. 5)

The initial wholly prescriptive approach by the [National Heavy Vehicle Regulator (NHVR)] was supportive of a relatively smooth implementation of the [Heavy Vehicle National Law (HVNL)], especially with the larger organisations within the road transport sector. With the evolution to a risk-based approach the NHVR is addressing adoption by both smaller entities within the road sector as well as other participants within the supply chain. (Grain Trade Australia, sub. 38, p. 5)

The [National Farmers' Federation] has traditionally supported risk-based approaches to regulation because, in theory, risk-based approaches should enable those subject to that regulation to implement their obligations in a way that best suits their particular circumstances. Risk-based approaches should also obviate the need for rules that seek to address all possible situations. Related to this, risk-based approaches should also reduce the need to be fully cognisant of all requirements – even those not relevant to your business – thus reducing the regulatory burden. What became apparent in the Chain of Responsibility awareness campaign was that the fear of prosecution meant those subject to the rules sought clear guidance on what constituted compliance. Users were concerned that they would have to wait for prosecutions to obtain this kind of certainty. (National Farmers' Federation, sub. 36, pp. 3–4)

... the HVNL does not currently resolve the tension between certainty by way of prescriptive requirements and the adaptability of performance based requirements. ... the HVNL seems to have a bet each way, forcing all operators and regulated parties to run a safety management system in a prescriptive regulatory environment. This must change with a greater focus on enforcement that is suitable to a modern, efficient industry. The HVNL is a poor piece of legislation. In particular the HVNL is different in scale and style from comparable laws. The HVNL is unduly large and highly prescriptive, with a lot of detail in the primary legislation. (NatRoad, sub. 7, pp. 3–4)

The choice of regulatory approach is not binary, and there are several aspects to consider. The regulatory approach should be suited to the structure of the industry and the nature of its safety risks. It should provide clarity and certainty to businesses, while allowing for innovation where possible. It should also be sufficiently adaptable to reflect contemporary evidence and address emerging challenges. Each approach has advantages and disadvantages, and requires different capabilities from industry, policymakers, and regulators.

Balancing prescription and outcomes-based approaches

Striking the right balance between prescription and flexibility can help minimise compliance costs while maintaining or improving the management of safety risks (figure 9.2).

Figure 9.2 Regulatory models with varying degrees of flexibility

	Prescriptive	Outcomes based	Tiered system
Role of policy / regulations	<ul style="list-style-type: none"> Identify risks / contingencies determine acceptable safe practices 	<ul style="list-style-type: none"> Allocate duties to appropriate parties Allow for practices to be agreed between regulator and industry 	<ul style="list-style-type: none"> Ability to categorise operators and apply different but equivalent forms of regulation Potential for opt-in or opt-out arrangements, use of accreditation
Role of the regulator	<ul style="list-style-type: none"> Audit and enforce compliance provide education on set standards 	<ul style="list-style-type: none"> Assess and accredit industry led systems Monitor outcomes 	
Role of industry / operators	<ul style="list-style-type: none"> Comply with set standards 	<ul style="list-style-type: none"> Identify risks and determine acceptable safe practices Set internal risk management systems 	<ul style="list-style-type: none"> Comply with prescriptive standards or opt into outcomes based regulation
Most suitable for ...			
Operators	<ul style="list-style-type: none"> Low capacity for developing and documenting systems and processes 	<ul style="list-style-type: none"> High capacity for risk management Documented internal processes Able to meet safety outcomes more efficiently 	<ul style="list-style-type: none"> Significant variation of business size and capacity Mixed or tiered industries
Safety challenges	<ul style="list-style-type: none"> Known, longstanding issues 	<ul style="list-style-type: none"> Complex systems or risks Rapid pace of change 	<ul style="list-style-type: none"> Mix of complex and straightforward issues
Enforcement approach	<ul style="list-style-type: none"> Enforcement officers have expertise on compliance Limited discretion 	<ul style="list-style-type: none"> Enforcement regime to account for flexible arrangements 	<ul style="list-style-type: none"> Varied approaches across different parts of the industry
Data availability	<ul style="list-style-type: none"> Sufficient for policymakers to set acceptable practice 	<ul style="list-style-type: none"> Sufficient for industry to set design systems and for regulators to assess 	<ul style="list-style-type: none"> Sufficient for policymakers to set acceptable practice, or Sufficient for industry to set design systems and for regulators to assess

A prescriptive (‘black letter law’) approach requires regulators and lawmakers to identify risks and mandate specific solutions, with industry simply expected to comply. Given that prescriptive regulations dictate particular actions and behaviours, they tend to work better in cases where risks are static and well understood, and there is a singular, desirable solution. For example, requirements around seatbelts have been longstanding, and enforcement of these rules is straightforward. In such cases, prescriptive rules may have the advantage of being simpler to enforce.

In other cases, where risks are complex and unpredictable, policy makers may not be in the best position to understand how best to manage a safety risk or to specify a single solution.

In these cases, it can be more effective to use an outcomes-focused approach, based on general safety duties, accreditation, and approved safety management systems

In practice, there are a range of advantages and disadvantages to each regulatory approach. For example, well-designed prescriptive regulations can be less costly to administer; rely less on regulator discretion; provide a mechanism to achieve regulatory harmonisation; and provide equivalent responsibilities for competing businesses. However, prescription deters innovation, as businesses lack the flexibility to manage their risks in more efficient ways. Prescription can also create a sense that businesses are primarily responsible for complying with regulation, rather than for managing safety risks to the best of their ability.

In many cases, transport safety regulation already exhibits flexibility. For example, the approach taken in the Rail Safety National Law (RSNL) involves the Office of the National Rail Safety Regulator (ONRSR) approving Safety Management Systems developed by rail businesses. Such outcomes-based mechanisms are established in underlying legislation (see chapter 5, section 5.3).

Another example of flexibility in safety regulation involves the use of safety duties. Where safety duties are accompanied by prescriptive regulations, operators can satisfy their duties by following prescribed means of compliance. In other cases, safety duties are often satisfied by outcomes-based approaches, such as in Workplace Health and Safety Laws; in the Western Australian approach to regulating heavy vehicles; and in heavy vehicle Chain of Responsibility Laws. The use of safety duties allows for the regulation of diverse risks for which it would be difficult to specify solutions (such as with Chain of Responsibility Laws applying to businesses throughout the supply chain). In some cases, the operation of safety duties could be improved with the provision of deemed to comply conditions (recommendation 6.2).

Safety duties provide businesses with legal responsibilities to manage safety risks as best they can (often ‘as far as is reasonably practicable’). This can contribute to the effectiveness of other regulations, rather than replacing them (box 9.3). Safety duties may also help align various safety regulatory regimes, ensuring that transport businesses are not required to manage the same risk in different ways solely to comply with prescriptive legislation. In some cases, conflicts between prescriptive regulatory regimes can be difficult for businesses to resolve, or can result in suboptimal choices (box 9.4).

As far as possible, approaches to safety regulation should take account of which party is best placed to understand and manage the safety risk. Doing so will usually require a mix of prescription and flexibility. In the interest of improving safety outcomes, there is likely to be benefit for transport safety regulators to reduce their reliance on prescriptive regulation. This allows operators to focus less on compliance with regulation, and more on their overarching responsibility to manage safety risks to the best of their ability. This could potentially improve safety management overall, or improve productivity while maintaining safety standards.

Box 9.3 **Multiple approaches to regulating heavy vehicle driver competency**

Heavy vehicle drivers are required to hold licenses appropriate for their particular class of vehicle. Several stakeholders have suggested that governments and industry should work to improve and promote driver competency (Freight and Logistics Council of Western Australia, sub. 22, pp. 4–5, QLD TMR 2019, p. 4, Victorian Transport Association 2019, p. 7, Jones 2019, p. 4). Licensing is an important tool, and the process of adopting a National Heavy Vehicle Competency Framework among jurisdictions is ongoing (NatRoad 2019).

However, licensing only relates to requisite skill levels for drivers to *begin* driving vehicles of a particular class. Drivers develop much of their capability *after* obtaining their licences, generally through experience and on-the-job training, specific to industry and task (for example, bulk and non-bulk freight, livestock transport, and oversize vehicles). Experience behind the wheel is often seen as being just as important as, if not more important than, formal training courses (Austroads 2018).

While licensing continues to serve as the main method of regulating driver competency, operators themselves would likely have a general duty under Chain of Responsibility to due diligence and reasonable steps to ensuring that appropriately skilled workers are employed for each task. The NTC will provide comment on driver skills via its review of the HVNL, and in relation to its issues paper on Safe People and Practices (NTC 2019).

Box 9.4 **Flexible regulation can better align compliance requirements of different regimes**

The HVNL sets out requirements for maximum driving times and minimum rest periods to manage risks associated with driver fatigue (chapter 5). At the same time, the Australian Animal Welfare Standards and Guidelines for Land Transport of Livestock stipulate requirements to minimise the risks of harm to animals, particularly during long trips. These include maximum periods that water may be withheld from live animals as well as other requirements such as the prompt unloading of livestock upon arriving at the destination.

Conflicts between these two regulatory regimes can occur when, for example, heavy vehicle drivers are required to take a long rest break under fatigue regulations, which requires leaving livestock contained in the vehicle, when the driver is not far from a suitable destination to unload the animals. Other external factors, such as weather conditions, may also affect a transport operator's ability to comply with either regulatory regime.

In September 2015, the NHVR introduced the Livestock Transport Fatigue Management Scheme. The scheme provides a pre-approved template for Advanced Fatigue Management accreditation, designed to give livestock and rural transporters the flexibility to respond to the dynamic, uncertain and complex livestock transport task (NHVR 2019). The templates can allow drivers to work to a 14- or 28-day schedule (with minimum days of stationary rest) or up to 15.5 hours across a 72-hour period. To the extent that this scheme increases flexibility and reduces administrative burden, it should make it easier for operators to comply with both livestock transport and fatigue management regulations. However, there still may be occasions where circumstances outside the control of heavy vehicle operators (such as extreme weather events) may warrant further flexibility for transport operators, provided the NHVR continues to be satisfied that fatigue risks are being suitably managed.

A tiered approach to transport safety

As in other industries, transport operators vary in size, experience, and capability. This is particularly true for heavy vehicles and domestic commercial vessels, where businesses range from owner-operators to multinational corporations. Given this landscape, there is likely to be value in adopting a tiered approach to safety regulation, which would allow operators to follow a clear, ‘deemed to comply’ set of provisions, or opt into a system that allows flexibility to meet acceptable safety outcomes in more efficient ways. Such an approach could involve prescriptive provisions (offering certainty and ease of compliance) complemented by the option of flexibility (with approval from the regulator) (figure 9.2).

The use of regulatory flexibility is most advanced in rail (chapter 5). ONRSR can approve safety management systems proposed by operators, and can implement more direct regulation where it sees fit. There is likely to be value in ensuring that similar flexibility is available for operators in other modes of transport, to operate alongside prescriptive ‘deemed to comply’ provisions, particularly in heavy vehicle regulation (see recommendation 10.1, chapter 10).

Ensuring safety regulation is adaptable

It is likely to be increasingly important for safety regulation to be dynamic and adaptable to change. While many transport safety risks are longstanding, many parts of the sector are likely to be disrupted by emerging technologies (for example, using autonomous technologies in vehicles, vessels, and trains).

A frequent criticism of prescriptive regulation is that it can be slow to adapt to new circumstances and evidence if excessive detail is specified in legislation. For example, any updates to the HVNL requires legislative change. This requirement makes the HVNL less easily adapted to reflect contemporary issues or new safety-related evidence. The Commission has heard from industry that aspects of weight restrictions and vehicle definitions entrenched in the HVNL discourage the use of safer technologies, such as twin-steer prime movers.

Removing prescriptive detail from legislation and placing it in other regulatory instruments would allow regulations to be updated more promptly, ensuring that the HVNL is not subject to inertia. To this end the Commission encourages State and Territory Governments to remove prescriptive material from legislation and instead include deemed to comply provisions in other regulatory instruments for which the NHVR has control. The type of regulatory instruments to facilitate this transfer should be considered further, with some potential options including disallowable instruments, codes of practice, or technical standards.

RECOMMENDATION 9.1 – REMOVE DETAIL FROM THE HVNL

The Heavy Vehicle National Law (HVNL) should be amended to remove unnecessarily prescriptive elements from the legislation and to support greater use of ‘deemed to comply’ provisions in other regulatory instruments.

In order to give effect to this recommendation, legislative change would be required from all governments that are signatory to the HVNL. This process should be led by the Australian Government through the Transport and Infrastructure Council.

These provisions would operate alongside recommendation 10.2.

Regulating emerging and disruptive technologies

Different approaches are available to regulators dealing with emerging technologies (box 9.5). In some circumstances, it is sufficient for regulators to advise industry of how to comply with existing regulations. In other cases, innovations may not fit into existing regulatory requirements.

Where it is clear how best to regulate the innovation, changes can be made to regulations through the usual policy channels. However, where the technology is still developing, and where the associated regulatory challenges remain unclear, there may be value in taking a more dynamic, anticipatory approach to regulation. The latter approach requires particular capabilities from regulators, and ongoing co-operative relationships with industry.

One such tool is the process of regulatory co-design, which focuses on collaboration between regulators and industry in developing regulatory responses:

Co-design has risks of capture, but the alternative is to either strangle nascent industry to the detriment of the economy, or to let activity that may well need to be regulated (to create a healthy long-term market) go ahead unchecked. Co-design of regulations and the compliance regime is needed for timely action, but good governance is critical to avoid regulatory capture. This must include transparency about the co-design process (who, what, when and how). (PC 2017c, Supporting Paper 13, p. 43)

Other regulatory tools require support from governments and flexibility in legislation. For example, ‘regulatory sandboxes’ have been used effectively by regulators such as the Australian Securities and Investments Commission (ASIC), to facilitate the development of digital services in finance (‘fintech’). Similar approaches are possible in transport — for example, AMSA has used its discretion to make regulatory exemptions when dealing with autonomous vessels, ahead of any permanent changes to regulations (chapter 8). In heavy vehicle regulation, by contrast, the National Heavy Vehicle Regulator (NHVR) deferred approving the use of electronic work diaries until it had developed a permanent regulatory framework for electronic work diaries (in 2018), and has undertaken case-by-case approval processes (ongoing).

Box 9.5 Advisory, adaptive, and anticipatory approaches

Armstrong, Gorst, and Rae (2019) outline different approaches to dynamic regulation:

Advisory

Advisory approaches are designed to make it easier for businesses with new products or services to approach regulators and work with them to test and then adapt the product or service under existing regulations. Innovators benefit from temporary relaxations in the full regulatory regime to test the potential impacts of their products or services, but the final goal is to fit within existing regulation. The regulator is able to play a more proactive, engaged role in the development and testing of new innovations in that sector.

Adaptive

Adaptive approaches are employed when a regulator wants to help facilitate the development of new products or services but existing regulatory frameworks may have to be adapted to do so. In this case, the objective is to first better understand the value of these new products or services by testing them in a restricted environment, then work to adapt both the innovation and/ or existing regulations to bring the product or service to market. As with advisory approaches, participants are given regular advice and granted temporary regulatory relaxations. Unlike the advisory approach, if necessary regulatory barriers are identified, then permanent changes to the existing regulations can be explored — generally on a case-by-case basis.

Anticipatory

The primary goal of anticipatory approaches is to better understand what the impacts of an emerging technology (which may not be developed enough for use) might be on the economy and society and, therefore, what the potential regulatory needs will be. It is more forward-facing than either advisory or adaptive approaches, meaning regulators have to deal with more uncertainty, less evidence and a greater number of possible risks. Here the regulator is not only playing a more active role in supporting innovation but also in building an information and evidence base via direct research activities.

Source: Armstrong, Gorst and Rae (2019, p. 20).

Policy design with a ‘system-wide’ view

In addition, safety regulation should also be designed and amended with an holistic awareness of the conditions businesses face (including the multiple sources of regulation). Transport businesses are subject to various economy-wide regulatory regimes (such as industrial relations or workplace and health and safety regulation) as well as multiple layers of transport-specific regulation (such as State and Territory licensing regimes).

Fishing vessels are subject to regulation relating to vessels, work practices, and fisheries management (box 9.6). A ‘system-wide’¹³ view is valuable when considering how the many aspects of regulation and policy might work together to improve safety outcomes. In transport, safety regulation should be designed in the context of other regulatory regimes that apply to the same operators, as each regime (or combinations thereof) may have implications for safety. Both policymakers and regulators must maintain an awareness of the mix of regulatory regimes that apply to transport businesses.

¹³ As discussed by the New Zealand Productivity Commission report on Regulatory Institutions and Practices (2014).

Box 9.6 **Operators of fishing (Class 3) vessels face multiple regulatory regimes**

Multiple regulatory regimes are relevant to safety in the fishing industry:

- AMSA administers the *Marine Safety (Domestic Commercial Vessel) National Law 2012 (Cwlth)* across all commercial fishing vessels that operate solely within Australian waters.
- Workplace Health and Safety (WHS) laws are administered by State and Territory agencies. Model laws developed by Safe Work Australia have been implemented nationally aside from Western Australia and Victoria.
- Boat licenses for commercial fishing vessels are issued by State and Territory regulators, based on jurisdiction-specific regulations.

In addition, various regulatory regimes may apply to fishing businesses, depending on their operation.

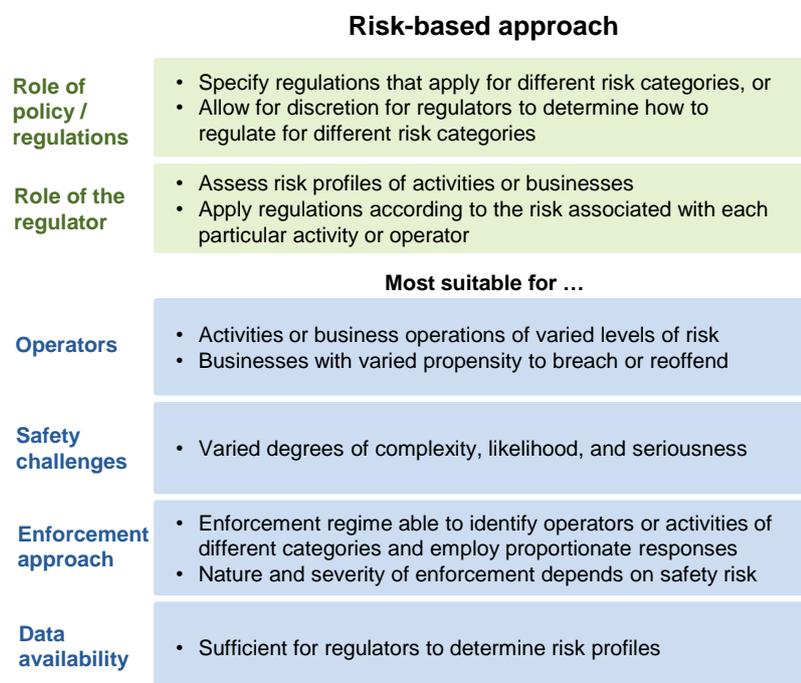
- The Australian Fisheries Management Authority (AFMA) manages and monitors commercial fisheries operating from three nautical miles away from shore to the extent of the Australian Fishing Zone. AFMA aims to ensure fish stocks and the fishing industry are viable.
- State and Territory regulators are responsible for fisheries management coastal and inland fishing and aquaculture, based on jurisdiction-specific legislation.

The regulatory incentives from the various regimes may not always align with safer outcomes. Crewing requirements under AMSA may be subject grandfathering provisions, and are minimal for vessels under 12 metres (AMSA 2018). Operators may also be subject to a range of 'input' or 'output' quotas, administered by fisheries regulators, which restrict the number of licenced fishers per boat, the size of boat, the time on water, or the type of equipment to be used. Restricting the number of fishing crew is used to regulate fish stocks, but has implications for safe fishing practices.

Encouraging a risk-based regulatory culture

A risk-based approach to regulation focuses on the risks associated with non-compliance, and allows regulators to deploy resources in proportion to the risk posed to regulatory objectives (figure 9.3). When a safety regulator employs a risk-based approach, it is recognising that different regulated activities or environments present different levels of risk to safety. Regulators can then tailor the delivery and administration of regulation so that both compliance and administrative costs are proportionate to the benefits of addressing those risks. Risk-based approaches already apply in various aspects of transport safety regulation (box 9.7), as well as in various other industries (IC 1991; PC 2013, 2015, 2017b, 2017a).

Figure 9.3 Risk-based approaches to regulation, compliance and enforcement



The extent of risk-based safety regulation is constrained where regulations are not justified on safety grounds by evidence. For example, some derogations to national law may prevent the application of regulations more commensurate with the nature or level of risk (see recommendations 4.1, 6.3, and 6.4). Some grandfathering provisions in the Marine Safety National Law (MSNL) prevent AMSA from applying consistent regulations to operators exhibiting similar safety risks (see recommendation 6.6). In many cases, addressing these constraints requires legislative change or other support from governments.

In other cases, regulators can use the regulatory tools at their discretion to implement risk-based approaches to their respective remits. This includes situations where a regulator can mandate a solution that carries a low compliance cost relative to the potential benefit. For example, AMSA already requires vessels to carry Emergency Position-Indicating Radio Beacons (EPIRBs) and should also require passenger vessels to be fitted with smoke detectors (recommendation 6.6).

Risk-based regulation can also result in more efficient, less intrusive regulation. For example, new technologies, particularly in heavy vehicles, may have a high exposure to risk and require stringent enforcement of standards. However, standards are also implemented by the advanced economies from which Australia imports most of its heavy vehicles. For the most part, those standards are accepted through the Australian Design Rules (ADRs), with some adaptation to Australian conditions. There would be value in better leveraging

international standards to manage risks associated with new technologies (recommendation 8.1).

Box 9.7 Risk-based frameworks in national transport safety laws

The legislative frameworks for ONRSR, NHVR, and AMSA vary in terms of their treatment of risk-based regulation. ONRSR's decision-making framework is inherently risk based. According to section 65 of the RSNL, ONRSR's assessment decision-making is based on whether applications demonstrate:

- competence and capacity to manage risks to safety associated with railway operations
- competence and capacity to implement the proposed Safety Management System (SMS)
- financial capacity or public risk insurance arrangements to meet potential liabilities arising from railway operations
- a level of consultation undertaken by an operator regarding their SMS.

While there is nothing explicit in the HVNL stating that the NVHR undertake risk-based regulation, some aspects are open to regulator discretion. For example, section 659 of HVNL outlines one of the functions of the regulator to include:

... to encourage and provide safe and productive business practices of persons involved in heavy vehicle road transport that do not compromise the object of the HVNL.

This suggests that the NHVR is required to consider the object of the HVNL and should consider those risks when encouraging safe and productive business practices.

The MSNL contains some risk-based framing of AMSA's enforcement task. The provisions of the MSNL are typically framed as duties, and AMSA determines whether there has been compliance. In many cases, the threshold is 'as far as reasonably practicable to ensure safety'. In section 27 of the MSNL, AMSA is required to consider matters including:

- the likelihood of a hazard/risk
- the degree of harm resulting from the hazard/risk
- what the person knows/ought to know about the hazard/risk and ways of eliminating/minimising the hazard/risk
- the cost associated with available ways of addressing the hazard/risk and whether the cost is grossly disproportionate to the hazard/risk.

For regulators to adopt a risk-based approach, they require sufficient flexibility in how they enforce the law (discussed further in chapter 10). This approach is most advanced in rail, where ONRSR's regulatory framework is inherently risk-based (box 9.7). Policy makers need to ensure that the degree of prescription in regulation does not unduly constrain regulators in how they respond to breaches or preclude the use of tools that may be necessary for effective and low-cost compliance strategies.

Within the prevailing legislative frameworks, safety regulators in heavy vehicle and maritime should continue to pursue risk-based approaches to compliance and enforcement. This may require regulators to develop corresponding capabilities and systems, such as evidence-driven strategies to identify risks and to create effective risk profiles.

Governments should set an expectation that transport safety regulators continue to pursue, develop, and apply risk-based approaches to regulation, particularly in their compliance and enforcement activities.

RECOMMENDATION 9.2 NATIONAL REGULATORS SHOULD TAKE A RISK-BASED APPROACH

The Australian Government should work with the Transport and Infrastructure Council to develop a statement of expectations for the National Heavy Vehicle Regulator (NHVR) and the Australian Maritime Safety Authority (AMSA). The statement should direct the national transport safety regulators to take a risk-based approach to regulation, enforcement and other functions.

9.3 Safer freight routes, vehicles, and equipment

As the freight task continues to grow, it will be increasingly important for freight to be transported by the safest possible means. This will depend primarily on commercial decisions through the supply chain, including freight customers' choices of mode, routes, and operators; and operators' choices around fleet renewal and technology adoption. Many of these decisions will not be directly subject to safety regulation. Rather, it is important that freight customers face efficient prices in each mode, reflecting the true cost of externalities such as safety; and that operators do not face regulatory disincentives to safer technology.

Safer vehicle configurations and equipment

Heavy vehicle access management has important implications for the use of more productive vehicles (chapters 7), and while this has already improved through the implementation of the 2009 COAG reforms, further improvements are possible (chapter 10). Efficient management of access could also play a role in improving road safety outcomes, given that using more efficient vehicles would reduce the number of trips relative to the freight task. As discussed in chapter 7, the amount of freight transported in 100 vehicle movements of a 26m B-double would only take about 80 movements with a 36.5m A-double.¹⁴ Implementing larger vehicles (where possible) could potentially translate into improved safety outcomes, assuming a similar rate of incidents per trip for each vehicle configuration.

This is not to suggest that every expansion of road access to larger vehicles would improve safety outcomes. It remains vital that road managers allow access to vehicles where the infrastructure can accommodate them, taking into account other factors relevant to public safety and amenity. In other words, safety outcomes would improve with more open access if it is a product of more efficient road access management. The latter could be improved by several recommendations in this report (see recommendations 7.3, 7.4, 7.5, 8.2, and 10.5).

¹⁴ Commission estimates based on ATA (2018, p. 10).

It is also important that industry continues to implement newer and safer vehicles and equipment. As discussed in chapter 8, some technological progress can have a profound effect on safety, just as seat belts, anti-lock braking, and airbags provided such benefits in past decades. Research suggests that several emerging technologies may have a significant effect on heavy vehicle safety outcomes as they are increasingly disseminated into the vehicle stock (box 9.8). Regulation has some role to encourage this — for instance, Electronic Stability Control (ESC) has been mandated through Australian Design Rules (ADR) for some vehicles. To this end, any improvements to the efficiency of the ADR process could contribute to improved safety outcomes (see finding 8.1, recommendation 8.1).

Box 9.8 Improving safety through technological progress

The NTC found that several emerging technologies may have a significant effect on heavy vehicle safety outcomes as they are increasingly implemented:

- Finding 3: as interim On-Board Mass (OBM) is only being used in two jurisdictions (New South Wales and Queensland) there is limited information available on the potential safety benefits of this technology.
- Finding 4: research suggests that fatigue and drowsiness detection devices may prevent between four and 10 per cent of fatal crashes, reduce the severity of injuries and achieve cost savings up to \$28 million.
- Finding 5: research estimates that Electronic Stability Control (ESC) and Roll Stability Control (RSC) may prevent between four and 56 per cent of fatal crashes. A 2018 Regulation Impact Statement for improving the stability and control of heavy vehicles estimated that mandatory ESC and RSC would save 126 lives and reduce the impact of road trauma on Australian communities by an estimated \$216 million.
- Finding 6: one study in Germany reported an eight per cent decline in rear-end collision rates after Emergency Brake Assist (EBA) became a standard feature in Mercedes-Benz vehicles. EBA has been mandated through Australian Design Rules for some vehicles.
- Finding 7: international and domestic research suggests that Autonomous Emergency Braking (AEB) may prevent between 20 and 50 per cent of crashes and reduce the severity of injuries.
- Finding 8: research has found that Forward Collision Warning Systems (FCWS) may prevent between 21 and 44 per cent of crashes and reduce the severity of injuries.
- Finding 9: several international and domestic studies have suggested that Lane Departure Warning Systems (LDWS) may prevent between four and 15 per cent of fatal crashes and reduce the severity of injuries.
- Finding 10: research estimates that Intelligent Speed Assistance (ISA) systems can further reduce heavy vehicle risks associated with speed and may prevent between 10 and 19 per cent of serious light and heavy vehicle crashes and injuries.
- Finding 11: research suggests that alcohol interlocks may prevent between five and 24 per cent of fatal heavy vehicle crashes and 11 per cent of injuries. (NTC 2018a, pp. 1–2)

Taking account of safety when choosing road and rail

In submissions to this inquiry, stakeholders from the rail industry discussed intermodal substitution between heavy vehicles and rail freight, arguing that shifting more of the freight task from road to rail could improve safety and reduce road congestion (box 9.9).

Competition between road and rail occurs most strongly on long distance freight routes. In situations where rail freight replaces road freight, there are likely to be safety benefits associated with moving larger amounts of freight on dedicated lines away from general traffic. Stakeholders have noted that on a per kilometre basis, rail could be up to eight times safer than road freight in aggregate (box 9.9).¹⁵

Box 9.9 Submissions on intermodal shifts and safety outcomes

Several stakeholders from the rail industry have stated that a shift from road to rail freight would result in improved safety outcomes:

Overall, Pacific National's experience is there has been no meaningful integration in freight transport markets to create a level playing field between road and rail policy. The best safety improvement would result from reducing rail red tape while significantly reducing rail access charges across all rail networks to encourage modal shift to this far safer, cleaner and community accepted form of freight transport. (Pacific National, sub. 24, p. 4)

... if governments want safer roads, less traffic congestion during peak commute times, and lower vehicle emissions, it is imperative to work with industry to develop and implement innovative policies and regulations to help advance the rail freight sector. (Freight on Rail Group, sub. 8, p. 3)

The level of incidents and accidents has fallen steadily over time and rail remains around eight times safer than road on a kilometres travelled basis. (Australasian Railway Association, sub. 26, p. 13)

In a press release dated 7 November 2018, the Freight on Rail Group (FORG) stated that recognition was required of the rail freight sector's significant contribution to reducing both accident costs and carbon emissions in Australia's transport supply chain. The statement highlighted that for every tonne of freight hauled, road freight produces 14 times greater accident costs. As above, this has been converted to a cost per vehicle km of \$0.11; however, the true cost of improved safety is immeasurable. (Australian Rail Track Corporation, sub. 31, p. 15)

As road and rail transport have different strengths, they are not perfect substitutes, and businesses will select the mode which best meets their needs, subject to market prices. Much of the freight load on major routes will not be contestable, and in many cases, road and rail act as complementary modes of transport. Where competition is possible, the relatively agile nature of road transport means that rail will not be suitable for all freight tasks and will be less efficient when there is double and triple handling over relatively short distances. As such, the relative safety benefits of rail freight are more usefully compared with regard to specific freight corridors (rather than in aggregate as above). This shows the importance of conducting transparent cost-benefit analysis on proposed infrastructure investments, taking a mode-neutral approach (chapter 10).

The share of freight transported by road and rail transport is subject to the commercial decisions of freight customers, and government regulation should be mode-neutral. In any mode of transport, it is important that externalities (such as safety) are priced into market decisions or regulated directly. An efficient outcome in intermodal freight would need to

¹⁵ This comparison is made in aggregate and not measured on a like-for-like basis on a specific freight route. It is difficult to extrapolate such findings to network-wide estimates of safety benefits of increasing use of rail freight, given that road and rail freight are not always substitutes, and given the dynamics of innovation in safety technologies.

balance many factors including the planning and building of freight-related infrastructure; the potential for regulatory costs to cause distortions to intermodal competition; and access arrangements. The balance between these issues are discussed in chapter 10.

9.4 Harnessing data to improve safety

Numerous parties can extract value from data. As discussed in chapter 8, the various stages of data use (such as generation, collection, integration, and analysis) present particular concerns for governments. Common across heavy vehicle, rail, and maritime transport is the increasing potential for data to be used to influence safety outcomes.

Safety regulators' use of data

Regulators in all three sectors need data to identify risks, promote safer behaviour and target enforcement. The Commission has identified several areas where regulators could improve their collection and use of safety data, including improvements to:

- incident reporting by owners of domestic commercial vessels and detailed public disclosure of safety incidents (see recommendation 6.5)
- data collected from periodic survey by accredited marine surveyors, which would be valuable to understanding of the vessel fleet, assessment of risk and informing policy choices (see recommendation 6.6)
- data collected to monitor the performance of heavy vehicle safety accreditation (see finding 6.4).

As outlined in chapter 8, increasing data collection and use has potential safety benefits for a range of parties. However, the scale of benefit depends on the degree of data capture relying on incident reporting (particularly in maritime) and the uptake of technology (particularly regarding telematics). The Commission has heard relatively consistent anecdotal evidence of recent experiences with data systems, showing that industry may have concerns that:

- generating and sharing data would require imposition of further compliance costs for businesses
- the use of data in safety regulation could lead to heavier handed, more interventionist enforcement
- sharing sensitive data may have commercial implications, such as benefiting competing firms
- the costs of contributing data may be shared more equally than the benefits of the system.

In particular, concerns about the use of data for regulatory enforcement have been longstanding. For example, at the introduction of the Intelligent Access Program (IAP) for heavy vehicles, it was labelled as 'big brother stuff' by a representative of the Australian

Trucking Association, and as a ‘policing device’ by the Australian Road Train Association (Whittaker 2008). These concerns have likely led to lower participation in the IAP system, with only three jurisdictions requiring IAP as a prerequisite for operating at higher mass limits (chapter 6).

In principle, technological capabilities alone should not set the approach to regulatory enforcement. Regulators should consider how best to use data in the context of the overall evolution of safety regulation, which would put less reliance on ‘command and control’ enforcement where possible. Data-sharing arrangements could be designed to allay industry concerns about heavier-handed enforcement. This could involve legal assurances restricting the allowable uses of data.

Regulators and other statutory bodies can use logistics and safety data to better inform industry decisions. The Australian Rail Risk Model (ARRM) is an example of data being harnessed to provide industry with better decision-making tools (box 9.10). The ARRM was developed by the Rail Industry Safety and Standards Board (RISSB), using safety incident data reported by operators. Data-sharing has allowed the model to be developed based on industry-wide information.

Box 9.10 Australian Rail Risk Model

The Australian Rail Risk Model (ARRM) is a model of safety risk on Australian railways (excluding light rail, heritage railways and cane railways), built around safety incident data. Its risk estimates are informed by reports on incidents provided by industry. The ARRM was developed for the Australian rail industry, to allow rail transport operators to examine the safety risk of their own operations and to compare their risk with an aggregation of other RTOs. Some businesses may also compare their rail safety risk at the national level. The purpose of the ARRM is to help the industry assess rail safety risk and, in the longer term, understand trends in rail safety risk leading to safety improvements.

The origins of the ARRM predate the COAG reforms. While RISSB had championed the idea for many years, the idea was supported by the NTC in 2008; by a review of RISSB in 2012; and by ONRSR in 2013 (Baker 2015, p. 1).

Source: Rail Industry Safety and Standards Board (2019).

It may not be feasible to replicate the ARRM model in other modes. However, access to high quality, industry-wide data will help regulators and industry create risk management tools and advice. Using data effectively is likely to become essential as regulations become more risk-based, and operators become more responsible for safety management. Moreover, data is essential for research and policy development — particularly in improving safety regulation. Agencies such as the National Transport Commission (NTC), the Bureau of Infrastructure, Transport, and Regional Economics (BITRE), and the national regulators themselves will benefit from investments in data infrastructure (chapter 8).

Maritime transport appears to be the least well-served by public research agencies aside from the regulator itself. At the time of writing, the NTC website shows no evidence of research into maritime transport, while the publication of maritime data and research by BITRE is limited to sea freight. Neither does maritime transport benefit from a body like RISSB in rail — as discussed in chapter 5, AMSA is unusual in the breadth of its remit. There is likely to be value in having public agencies besides the national regulator conducting research into maritime safety.

Telematics and insurance

There is increasing potential for providers to set premiums based on new sources of personal data (such as from linked commercial databases) and from on-road telematics data (such as real-time vehicle location, timing of vehicle use, and amount of vehicle use) (PC 2017b, p. 87). One provider of telematics-based insurance in the United Kingdom found that the likelihood of being involved in an accident reduced by between 35 and 40 per cent for drivers aged 17-21 over the first year of the policy, which the provider attributed to the telematics-based incentive scheme (Insure the Box 2012). The use of telematics by insurers could not only influence behaviours of heavy vehicle drivers, but of road users more generally (the latter being relevant to this inquiry given the high proportion of heavy vehicle incidents caused by other road users).¹⁶

Telematics-based insurance is much more pervasive in the United Kingdom than in Australia. While the uptake of telematics-based insurance is largely commercially driven, it is also limited by the regulation of Australian insurance markets. Unlike general vehicle insurance (covering damage to property) which is open to competition, compulsory third-party (CTP) vehicle insurance (covering third-party bodily injury) has various regulatory restrictions, including constraints on linking insurance premiums with the risk profiles of drivers. The separation of insurance into compulsory and non-compulsory segments also differs to the UK system.

Within the current Australian model of vehicle insurance regulation, telematics could only conceivably be used to price optional forms of cover (covering damage to own vehicles and third-party property). A small number of insurers are implementing this approach to pricing¹⁷, but it does not appear to account for a large proportion of insurance policies.

¹⁶ Among fatal multi-vehicle incidents involving a heavy vehicle in 2017, where an insurance claim over \$50 000 was made to the National Transport Insurer, 83 per cent were caused by third parties and not by the heavy vehicle (NTARC 2019, p. 23).

¹⁷ Ubicar (2019b) cites a total of three providers of telematics-based vehicle insurance in Australia, noting that it is not offered by ‘the majority of insurers’.

Could the UK results be replicated in Australia?

Opening CTP insurance to full risk-rating in Australia would be a fundamental change, with far-reaching consequences. One proponent of the reform estimates that such a move could lead to significant benefits in terms of road safety outcomes, although it could also quadruple the cost of compulsory insurance for 17 year old drivers (box 9.11). These price increases were not incidental to the estimated safety benefits, rather they were central to them, as they would discourage younger people from driving and encourage them to ‘opt for other forms of transportation’ (Tooth 2017, p. viii).

Box 9.11 Risk-based CTP could increase premiums for younger drivers and reduce vehicle use

The literature on the potential impacts of risk-based CTP insurance in Australia is relatively limited, aside from Tooth (2017) who describes their estimates as ‘purely indicative’. The paper describes ‘Scenario 1’ as a situation where vehicle insurers would bear the cost of claims on bodily injury-related insurance (what is covered by CTP) and be free to price based on risk (as is the case in several other countries). They estimate that:

... under Scenario 1, the [insurance covering bodily injury] premiums for a 17-year-old driver would quadruple. This would increase the annual cost of owning and driving an inexpensive car — which is around \$5200 per annum — by around 30 per cent and result in some to opt not to drive. An estimate of the responsiveness to price changes is given by an own-price elasticity of demand for driving of -0.3; implying that under Scenario 1 there would be a 9 per cent reduction in 17-year-olds driving (and consequent reduction in road crashes by 17-year-olds). A larger effect would come under Scenario 2. (Tooth 2017, pp. 8–9)

The potential for risk-based CTP insurance to discourage younger drivers from driving is key to the estimated safety benefits of the proposed reform:

Based on variation in insurance premiums, the safety benefit would likely be greatest in deferring the decision by young people to drive. (Tooth 2017, p. 9)

The reduction in vehicle use is also considered to result in ancillary benefits:

In addition to implications for road-safety, claims and insurance costs, ... [perhaps] the most significant additional benefit will be in reducing vehicle use. Risk-based insurance pricing would increase the cost of additional driving, thereby discouraging people from driving. This would result in reduced vehicle congestion and environmental impacts associated with petrol consumption (i.e. carbon emissions and other air pollution) and vehicle noise. (Tooth 2017, p. 26)

Based on these estimates, a move to full risk-rating of CTP insurance would raise questions around equity. For example:

- drivers who are deemed high-risk would be given greater incentive to ‘opt for other forms of transportation’ (p. viii), although access to other forms of transport varies geographically
- given the large estimated price increases for young drivers, the effect of risk-based CTP insurance would vary by age and ability to pay.

In considering the future of vehicle insurance, the Actuaries Institute noted that:

A key issue is whether society wants individuals to pay a ‘fair price’ for insurance that reflects risk or does it want everyone to have affordable access to insurance regardless of the risk. (2016, p. 5)

In the UK system, the higher prices charged to younger people are counteracted somewhat by telematics-based insurance (that is, premiums are lower for telematics-based policies). Real-time information about how the person drives (including speed, acceleration, harsh braking, and time of day) are used as the basis for a system of points and penalties that have real financial implications. Effectively, the insurers use these financial penalties to intervene in a driver's behaviour. Insurers such as Insurethebox, Marmalade, and Coverbox all contact drivers by phone or message if they consistently record indicators of unsafe driving:

Marmalade warns persistently bad drivers of a £125 to £250 charge, and if it is not paid the policy is cancelled. 'If a journey is flagged as red, meaning it contained some potentially dangerous driving, we will call our customers to discuss the problems. And yes, if it keeps happening, our customers understand that there will be a charge of £250. This is a hugely effective disincentive to poor driving, and over 95% of our customers consistently drive well.' (Collinson 2017)

At £250, the financial penalties issued by UK insurers are comparable to fines issued for serious offences in Australia, such as failing to give way at a stop sign (which incurs a fine of \$300 in Western Australia, \$330 in Victoria, and \$344 in NSW). While insurers would be commercially motivated to issue fines that relate to safety incident risk, the accuracy of those indicators are subject to technological constraints as well as the degree of competition between insurers (box 9.12).

In any case, allowing a more risk-based approach to CTP insurance would represent a fundamental shift that is beyond the scope of this inquiry. Without the addition of telematics, the implications of risk-based CTP insurance would vary according to age, ability to pay, and proximity to public transport, and would likely include significant additional costs (or discouragement from driving) for younger people. With the addition of telematics, price increases would be more muted, although insurers could play a more interventionist role in driver behaviour, including by issuing financial penalties that rival serious traffic offences.

It may be simpler to derive safety benefits from telematics in heavy vehicle freight transport rather than road transport more generally. Heavy vehicles are generally insured for significant amounts (given the costs of the vehicle and freight), and as such, insurance may provide powerful incentives without the need to redesign CTP. For example, National Transport Insurance provides incentives around premiums, fees, excess, and restrictions for operators who implement driver-monitoring technology (National Transport Insurance 2020).

Moreover, if telematics-based insurance were used for heavy vehicles, it could be possible to focus on variables that are directly relevant to heavy vehicle safety incidents. For example, the Commission has heard that by monitoring speed and g-force data to assess cornering behaviour, telematics can be used to monitor potential heavy vehicle rollover incidents.

Box 9.12 Telematics and proxies for safe driving

For telematics to be used to monitor driving quality, this requires the design of accurate, measurable proxies for safe driving practice that can be applied consistently to a broad group of drivers. These proxies would not need to be perfectly accurate in order to be useful in setting incentives. However, to the extent that punitive measures apply to safe drivers (or where they fail to apply to risky drivers), this weakens the incentive regime. One submission noted that:

A key advantage of a market-based approach is that companies would compete to find the most accurate, measurable proxies for safe driving practice. If an insurer imposed punitive measures that did not reduce crash costs, then they would lose business to other insurers with better, less-punitive, measures. (Richard Tooth, sub. 69, p. 4)

While competition would likely improve the development of proxies for safe driving, there are limits to what can be detected by telematics units as they currently exist. For example, in Australia, 23 per cent of accidents were caused by failure to give way, while 31 per cent were nose-to-tail collisions (AAMI 2018). Alcohol is involved in around 30 per cent of fatal road accidents. Yet, telematics units that operate based on geospatial location would not be able to detect a failure to give way (which requires a situation-specific understanding of road rules), nor proximity to other vehicles, nor alcohol consumption.

Several telematics-based insurers punish drivers for sudden, harsh braking (Tooth 2012; Ubicar Australia 2019a). Such braking could reasonably be associated with imminent collisions, and repeated harsh braking may be a sign of poor driving practice. However, in some instances, sudden braking can be a product of good driving practice — such as in reaction to dangerous or erratic behaviours of other road users (for instance, a car may brake suddenly to avoid a careless pedestrian).

In some ways, regardless of the proxy, punitive measures based on telematics will lack an appreciation of context, and hence of the true safety risk. In this sense, even if it is commercially justifiable to account for harsh braking when setting insurance prices, due to correlation with incident claims, it could also potentially punish safe drivers.

Operators' use of telematics to improve safety

There is likely to be considerable scope for telematics to improve safety outcomes if owned and used by transport operators themselves — as has been increasingly the case (box 9.13). Data from these systems would allow operators to monitor and develop driver competency, thereby reducing risks to vehicle assets. As such, the continued development and proliferation of telematics technology could lead to safer driving, in addition to other productivity-driving applications (such as logistics management).

Box 9.13 Heavy vehicle operators' use of telematics

The NTC made the following findings in regard to operators use of telematics and to track vehicles, monitor speed, and inform targeted driver training programs:

- Finding 12: a 2018 study conducted by Teletrac Navman reported that 89 per cent of respondents use telematics to monitor vehicle tracking, 67 per cent use telematics to monitor speed, 57 per cent to monitor distance travelled and 51 per cent to monitor driver hours.
- Finding 13: Many transport operators are increasingly adopting safety technologies and telematics to derive safety, productivity and commercial benefits. Safer operators are using telematics and safety technology in the following ways:
 - J.J. Richards and Sons use speed limiters on their entire heavy vehicle fleet, leading to shorter stopping distances and more time to identify and react to dangers ahead.
 - Linfox has partnered with Telstra and MTData to implement an advanced telematics and management solution into its Australian truck fleet.
 - Rod Pilon Transport driver, Rod Hannifey, drives a TRUCKRIGHT Industry Vehicle (TIV), which aims to improve awareness and road safety. The TIV has Teletrac Navman telematics installed to allow Rod to operate under IAP. ...
 - Simon National Carriers has developed its own in-vehicle telematics solution to meet the needs of the business. The telematics system records location, speed and self-declared mass and integrates business work and rest time management with payroll and their own freight management systems.
 - Toll Group are ... undergoing a \$1.5 billion equipment upgrade, which include introducing a new fleet with the latest safety equipment and telematics on board. The managing director of Toll Group has issued a direction that every new vehicle purchased must have telematics. ...
- Finding 14: stakeholders advised that chain of responsibility has positively influenced some operators to make the right choices and ensure they can demonstrate compliance. Some industry stakeholders provided anecdotal evidence that some operators will not use vehicles if telematics devices are not fully functioning because of chain of responsibility duties.
- Finding 15: used effectively, telematics can positively influence drivers' behaviours, attitudes and the safety culture of an organisation. Telematics data reports can highlight trends in unsafe behaviours such as speeding and harsh braking, which can then inform data-based and targeted driver training programs. (NTC 2018a, pp. 2–3)

Facilitating data-generation and sharing

As discussed in chapter 8, realising the full value of data will require a mix of facilitating regulation and commercial incentives to generate and share data. In some instances, safety benefits have justified mandating new systems (for example, the Vessel Monitoring System used by some offshore fishing vessels). In other instances, adoption has been voluntary with the result, to date, of patchy take-up by operators (for example, in-vehicle telematics). The risk exists that the full potential of new data technologies will not be realised if industry participation is limited.

The willingness of businesses to invest in generating and sharing their data will depend on how the data might be used. As the Commission has previously noted:

People and organisations are more willing to share information when they trust how it is being used and can see personal benefits stemming from access to their data that go beyond the immediate service they access ... (PC 2017b, p. 373)

In terms of technological progress alone, there is likely to be great potential for telematics and similar data systems to be used to enhance enforcement capabilities. Governments and regulators should aim to facilitate operators' adoption of technologies to generate and share data, and consider how the use of data by various institutions can influence safety outcomes.

FINDING 9.1

While some potential benefits of logistics data are specific to the individual operator, there are larger, broader benefits from the collection and integration of data across many operators. These broader benefits risk being underprovided if data generation and sharing are not facilitated.

RECOMMENDATION 9.3

Governments (and their agencies) and industry should consider how best to harness logistics and telematics data to improve incentive-based safety regulation, with the aim of influencing behaviours that increase safety and productivity.

Governments and regulators should aim to facilitate operators' adoption of technologies to generate and share data by:

- providing legal assurances about the acceptable use of such data
- clarifying the value to individual operators of their participation in data-sharing regimes.

9.5 Improving incident investigation

Transport policy, regulation, and industry practice could all benefit from an improved understanding of the systematic causes of safety incidents. While investigations by law enforcement, coroners, and insurers are designed to identify direct technical causality and legal liability, more systematic and circumstantial factors are likely to fall outside of their focus. Understanding these factors requires not only incident investigation, but also historical analysis and extended research into the supply chain, the manufacturing chain, and various chains of responsibility. Systematic safety concerns will increase in importance as technology develops (particularly with autonomous transport, where systems themselves have agency), and as supply chains become more complex and integrated.

In both air and rail transport, independent 'no-blame' investigation helps build understanding of the systemic causal factors of safety incidents. These investigations are designed to determine both the technical cause of an incident, as well as any systemic safety

issues occurring across a particular form of transport. This no-blame form of investigation does not apportion blame or provide a means for determining criminal or commercial liability (ANAO 2019, p. 7). No-blame investigations can provide valuable lessons and other information to policy and regulatory decision makers, contributing to improved safety regulation in the longer-term. In these ways, no-blame investigations differ to other forms of incident investigation (box 9.14).

Similar models are used internationally to complement safety regulation, across all modes of transport. No-blame investigation allows for informed policy recommendations to be made independently of governments, and for advice to be provided to industry without asserting legal wrongdoing.

In Australia, no-blame incident investigations are predominantly undertaken by the Australian Transport Safety Bureau (ATSB). The ATSB is Australia's only national transport incident investigator, though its legislated jurisdiction does not include road transport. Within New South Wales and Victoria respectively, the Office of Transport Safety Investigations (OTSI) and the Office of the Chief Investigator, Transport Safety (CITS) have jurisdiction to investigate incidents involving passenger buses, rail and light rail, as well as some marine incidents.

Box 9.14 Types of transport investigations

When serious transport incidents occur, they may be subject to one or more forms of investigation. Each type of investigation serves an important function and can improve transport safety by reducing the risk of future accidents.

Transport incident investigations can be undertaken by:

- police forces, to determine any immediate criminal liability
- State and Territory coroners' offices to determine legal liability and to examine extenuating circumstances in the case of fatal incidents
- independent bodies such as the Australian Transport Safety Bureau, to determine the technical causes of accidents, and to publish findings and policy recommendations
- regulators, for administrative, compliance and enforcement purposes
- transport operators, to inform operational improvements
- manufacturers, to inform product improvements
- insurers, to determine liability
- researchers, to identify trends and inform policy.

Some investigations, such as those undertaken by coroners' offices or the police, focus on 'finding fault' as part of enforcing the criminal law. Such investigations may conclude at the point when investigators have determined whether or not prosecution is needed. The results of such investigations are often not released publicly, and may therefore not be able to be analysed across jurisdictions in an aggregated manner.

Source: ATSB (sub. DR58).

Funding of no-blame investigations

In Australia, no-blame investigations are often funded on a case-by-case basis, with funding only provided by State and Territory Governments after an incident occurs. This may require incident investigators to undertake lengthy (and costly) negotiation processes with governments following an incident (who may ultimately decide not to fund a particular investigation).

There are likely to be benefits to funding no-blame investigations through government appropriations, consistent with the approach applied to most overseas no-blame investigators. For instance, providing a transparent, consistent stream of funding enables no-blame investigators to adequately plan for their various tasks ahead of time. This allows investigation bodies to invest in the recruiting and retaining of resources and staff with particular skills (ATSB, sub. DR58, pp. 3–4).

Funding no-blame investigations at a national level, with contributions from State and Territory Governments, would also ensure independence of the national transport safety investigator. This model prevents funding being determined according to whether the investigation could have a ‘direct’ benefit to a particular jurisdiction. Rather, lessons learned from incidents are likely to be broadly applicable to the industry as a whole.

Incident investigation for heavy vehicles

This inquiry has already noted the importance of data for better safety regulation and infrastructure management. Recommendations in chapter 5 would support better collection and use of data by the national regulators, while recommendations in chapter 8 and earlier in this chapter focus on the generation and sharing of logistics data. Incident investigation is another important source of transport data.

Independent, no-blame investigation would enable consideration of all factors that may have contributed to an incident in an uninhibited and impartial manner, including any issues related to the supply chain, the manufacturing chain, various other chains of responsibility, as well as the regulatory regime itself. Several stakeholders have called for some form of no-blame investigation into heavy vehicle incidents (box 9.15).

The lack of independent, no-blame investigations into road incidents to date may appear counterintuitive, given the relatively large number of safety incidents in the sector. However, the quantity of serious incidents also presents challenges, as it would be prohibitively expensive to investigate all safety incidents involving heavy vehicles. In the United States, this challenge is resolved by the National Transportation Safety Board (NTSB) investigating ‘significant road crashes’ (NTSB nd).

There would be value in no-blame investigation in cases likely to uncover systemic issues, potentially leading to a significant improvement in safety practice or policy. In Australia, such investigations are conducted only by New South Wales and Victorian agencies, and

only for incidents involving buses. The NHVR would not be suitable for a role as a no-blame investigator, as it would be compelled to use information from its investigation to enforce compliance with the HVNL. An appropriate investigatory body would require significant technical expertise, as well as legal powers to gain access to the information needed to undertake investigations. For these reasons, the ATSB is best placed to undertake this role.

It may be useful to test the value of ATSB involvement in the sector, and determine a narrow set of incident types with the potential to inform policy, before conducting investigations. This approach could include a phased transition to the role, including an initial period focused on collecting and analysing data through desktop research. The ATSB could work with government agencies and industry to establishing common data protocols and conduct research to determine the key issues occurring in the heavy vehicle sector and to inform policy, regulatory and operational decisions (ATSB, sub. DR58, p. 8).

Box 9.15 Calls for no-blame investigation in heavy vehicle transport

Several stakeholders are in favour of no-blame investigation for heavy vehicle safety incidents:

The existing investigation system is not suitable to the need to investigate the causes of the accident with relevant experts, including where technology and software needs investigation. This will be an increasing issue as the level of automation in vehicles increases. ... It is critical that ATSB-style investigations are conducted by an independent agency and are not included in the role of existing agencies involved in heavy vehicle regulation such as the NHVR. (Australian Trucking Association, sub. 32, p. 12)

Introducing ATSB investigations of road crashes involving trucks would supplement, not replace, existing police and coronial investigations and would provide valuable insights and recommendations for improving safety. (Australian Trucking Association, sub. DR76, p. 7)

A consistent, cross-industry and nation-wide approach to safety investigations is supported as it will draw from a wider range of data and support more robust policy decisions. (Brisbane City Council, sub. DR45, p. 7)

It is NatRoad policy that a dedicated authority such as the Australian Transport Safety Bureau (ATSB) be given power to promptly and fully investigate serious truck accidents and to share the results and recommendations publicly so that all industry participants can take the appropriate action to reduce the road toll. That role should also encompass better research on trends and causal factors, such as a growing difference between the level of improvement in the safety record of articulated trucks when compared with heavy rigids. (NatRoad, sub. 7, p. 7)

The ATSB could have an expanded role that included some heavy vehicle related incidents, providing it was not mandatory and that these investigations were complimentary [sic] to other investigations, such as those conducted by Coroners. These could provide valuable transport expertise to the investigation of incidents such as the spate of trucks that lost breaking power descending the South Eastern Freeway into Adelaide in 2014. (South Australian Freight Council, sub. 6, p. 8)

Establishing a heavy vehicle role for the ATSB would require overcoming some legal and logistical barriers. The *Transport Safety Investigation Act 2003* (Cwlth) grants the ATSB the power to investigate certain accidents and incidents, obtaining evidence and protecting it in the course of a no-blame safety investigation, and there is no such power for heavy vehicles. Therefore, enabling the ATSB to conduct research and investigate incidents involving heavy vehicles, even on a trial basis, would require legislative change. In transitioning to this new

role, the ATSB would also need adequate time and resources to attract and develop staff with the relevant skills to undertake heavy vehicle investigations. For example, the ATSB suggested that it may take between 18 months and two years to train investigators (ATSB, sub. DR58, p. 8).

FINDING 9.2 – LACK OF REPORTING AND ANALYSIS OF SAFETY INCIDENT DATA

There is a lack of publicly available data on safety incidents involving heavy vehicles. Analysis of national incident data, supported by targeted no-blame incident investigation, would help to identify systemic issues and inform safety policy.

Incident investigation for rail

No-blame investigation in the rail sector is not consistently resourced. Arrangements between the ATSB, OTSI, and CITS (OTSI, sub. 40, pp. 3–4) effectively mean that NSW and Victorian Governments contribute extra resourcing to incident investigation within their states, and can retain some control over investigation. Funding arrangements between the ATSB and other jurisdictions vary. Inconsistencies in funding can be problematic for long-term capability building and timeliness of reporting — the latter being raised by several stakeholders (box 9.16).

The ATSB argued that its investigations involve the creation of preliminary reports (typically within 30 days) and that they work with operators and regulators to disseminate lessons throughout the process (trans., p. 168). In this sense, a final ATSB report is a publicly available summary of the results of the investigation and what has already been recommended or which actions have already been taken. However, a recent audit by the Australian National Audit Office (ANAO) acknowledged the ATSB’s focus on clearing backlogs of cases, and recommended that strategies be used to improve timeliness (ANAO 2019). Such improvements will likely come through processes already in train, however, given substantial backlogs and historical underfunding of the ATSB, greater and more consistent resourcing is likely to be required.

Box 9.16 Stakeholder views on incident investigations in rail

Participants were generally supportive of the role of the ATSB in rail incident investigations. For example:

The ATSB is responsible for 'no fault' investigation for rail and ONRSR has procedures in place so that relevant safety critical information is received from the ATSB for verification and action as appropriate. This model works well for rail as it protects the identity of reporters but still allows ONRSR to remedy any safety issue that needs addressing. (ONRSR, sub. 21, p. 41)

However, some also made comment on the timeliness of the investigations:

[Australasian Railway Association] members are particularly concerned by the timeliness of ATSB feedback and reporting. We also understand that the ATSB has been engaged in processes to improve timeliness, for example through seeking further funding. ... Nonetheless, the ARA remains concerned that too little is being done in this regard. (Australasian Railway Association, sub. 26, p. 32)

Arc is highly supportive of retaining the ATSB with its current mandate to perform no fault accident investigations as required. That said, Arc acknowledges that there is room for substantial improvement on the part of ATSB, particularly with regard to the timeliness of findings. ... If the ATSB were to perform its role more effectively, Arc believes that national safety outcomes could be further improved. The ATSB should be more active in the WA rail sector, and should seek to streamline its internal processes to ensure that findings from investigations are delivered in a timely fashion. (Arc Infrastructure, sub. 17, pp. 13–14)

Incident investigation for domestic commercial vessels

The ATSB has had a longstanding role in investigating major maritime safety incidents, and received 238 marine notifications in 2017-18 alone. However, its historical role related only to 'civilian interstate and overseas shipping', involving: Australian-registered ships (anywhere in the world); foreign ships in Australian waters; and foreign ships en route to Australian ports (ATSB, sub. 39, p. 3).

The ATSB did not have a formal remit for domestic commercial vessels before the COAG reforms of 2009, and no such role was created as part of that process. The MSNL does not specify any role for incident investigation bodies. While AMSA could investigate safety incidents, there are clear advantages from having investigations independent of the regulator.

As discussed in chapter 5, there is a dearth of reliable information about domestic commercial vessels, partly due to the different approaches to data collection before the COAG reforms. As a priority, a role for the ATSB to investigate and conduct research among marine incidents involving domestic commercial vessels should be formalised and fully resourced.

Incident investigation for autonomous technologies

While no-blame investigations may be able to identify problematic actions, practices, work cultures, or incentives, they are also particularly useful in the context of emerging technologies. Systematic safety concerns will increase in importance as technology develops (particularly with self-driving, autonomous technologies, where systems themselves have agency), and as supply chains become more complex and integrated. In the field of aerospace, recent investigations by organisations such as the NTSB in the United States were able to identify problems stemming from newly introduced technologies in Boeing 737 MAX aircraft, leading to the grounding of all such aircraft and accountability for manufacturing processes (NTSB 2019).

As discussed in chapter 8, the development of autonomous vehicle technology is progressing for both heavy and light vehicles — trials for autonomous vehicles have occurred in each jurisdiction, and the Transport and Infrastructure Council (TIC) have agreed to the development of a national safety assurance scheme (NTC 2018b). An appropriate mechanism for incident investigation should be required of both the trial and early adoption phases.

Conducting no-blame investigations into incidents involving autonomous road vehicle technologies would enable systemic issues to be identified at the earliest possible stage. Since the autonomous vehicle sector is still developing, findings from such investigations have the potential to inform long term responses, which may have significant safety benefits as these technologies are adopted more widely. This approach would also be consistent with international precedent, as overseas investigators including the NTSB have a role in investigating such incidents.

In Australia expanding the remit of the ATSB to include autonomous road technologies would allow the ATSB to apply expertise and lessons learned from autonomous technologies in other modes, such as aviation, on a national basis. The Australian Government should amend the *Transport Safety Investigation Act 2003* (Cwlth) to enable the ATSB to conduct research and investigate incidents involving autonomous road vehicle technologies (including light vehicles).

RECOMMENDATION 9.4 – NO-BLAME INCIDENT INVESTIGATION AND RESEARCH

The Australian Government should:

- provide a sufficient annual appropriation to enable the Australian Transport Safety Bureau (ATSB) to carry out its functions, both existing and as proposed in this inquiry
- formalise the role of the ATSB in conducting investigations and research involving Domestic Commercial Vessels and rail
- amend the *Transport Safety Investigation Act 2003* to enable the ATSB to conduct research and investigate incidents involving heavy vehicles, and autonomous vehicle technologies
- direct the ATSB to undertake a clearly defined, phased transition into the heavy vehicle role, including an initial period of data collection and research to identify any systemic issues and incident types with the potential to inform policy.

The costs of the ATSB should not be subject to cost recovery from industry, but the States and Territories should support the Australian Government by providing a consistent contribution to its total costs, rather than on a case-by-case basis.

10 Further reforms to improve transport productivity

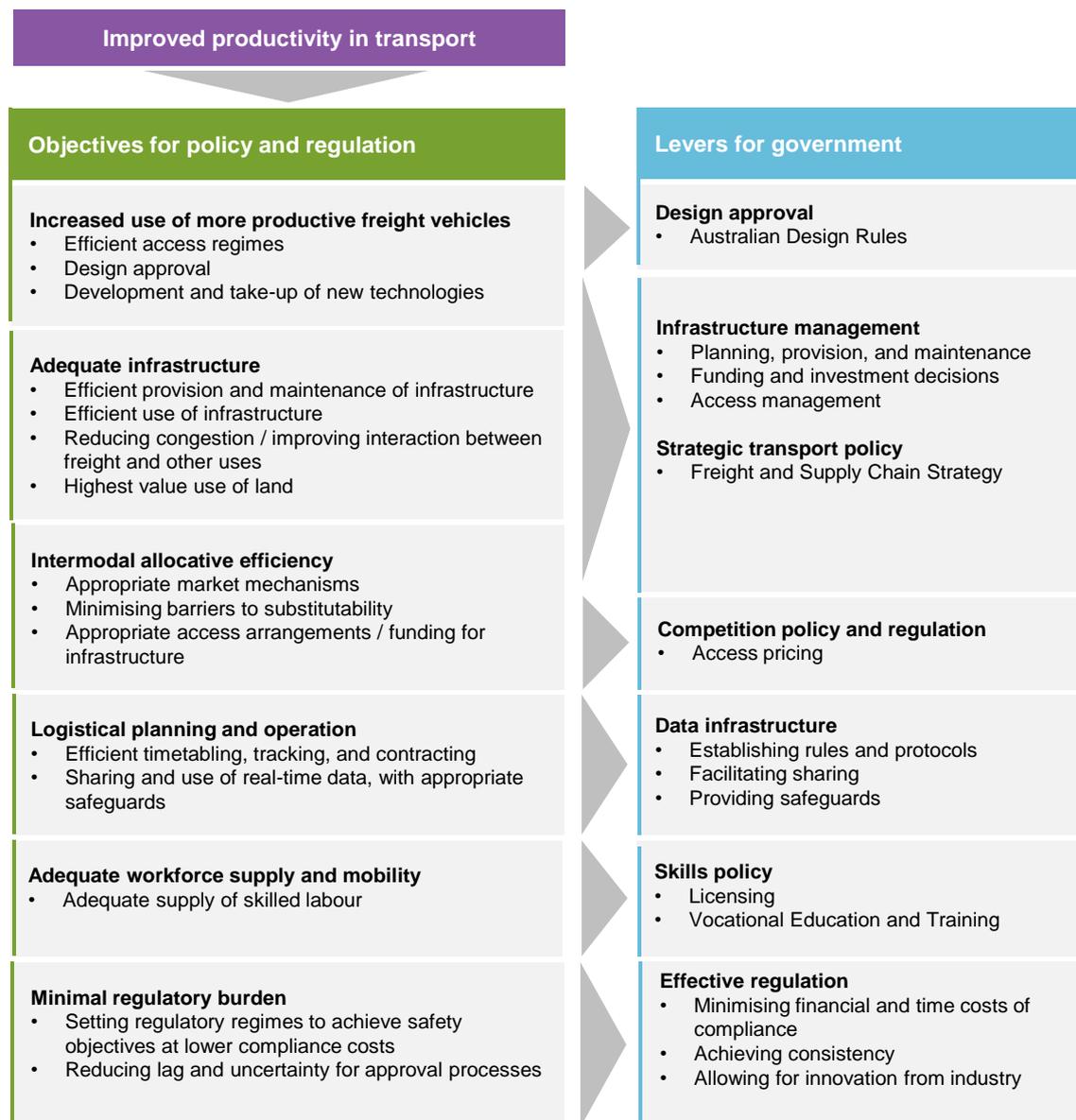
Key points

- Transport productivity is dependent on several issues beyond the scope of the harmonisation agenda.
- Safety regulation can make a significant contribution to productivity growth by:
 - allowing sufficient flexibility and innovation, including through a tiered system in heavy vehicle regulation
 - minimising compliance costs and ensuring efficient administration costs of regulation.
- Several improvements could be made to infrastructure provision and management.
 - The advancement of Heavy Vehicle Road Reform would establish clearer links between the demand and supply of road infrastructure.
 - Road managers must make informed, timely decisions. This requires adequate resourcing and sufficient knowledge of those assets, as well as sufficient engineering skills and decision-making capabilities.
- Improving rail and heavy vehicle productivity requires considered, informed investment.
 - A range of bodies are working to address the current problems with infrastructure funding, particularly for roads.
 - Making better use of existing transport infrastructure, by reducing congestion on road and rail networks, is essential to improving productivity.
- In freight, road and rail often act as complementary modes of transport, although there is some limited substitutability. An efficient outcome in intermodal freight would need to balance many factors. Governments should:
 - take an intermodal perspective in choosing projects (as well as using transparent cost-benefit analyses for each project)
 - be committed to minimising compliance costs where possible
 - be open to improving access management in each mode; to better reflect infrastructure demand and supply; and to adequately fund infrastructure maintenance and provision.
- Advances in transport and data technologies, including data collection and sharing, would improve transport productivity.
 - Data are necessary for informed planning and decision making by a range of bodies including governments, regulators, infrastructure managers, and businesses.
 - The right data infrastructure is required to facilitate a greater collection and usage of data.

10.1 Introduction

Productivity is influenced by many factors, including technological change, innovation, competition, regulator behaviour, government policy and regulation (figure 10.1). The establishment of the national regimes was intended to improve the efficiency of transport safety regulation, with positive implications for productivity. However, by focusing on safety regulation (and to some extent, heavy vehicle access), these reforms excluded other important government policy levers.

Figure 10.1 **A range of factors are involved in improving productivity in transport**



Lifting transport productivity is no less important today than it was when the Council of Australian Governments (COAG) members agreed to the harmonisation agenda more than a decade ago. The volume of freight is expected to grow by over 35 per cent (urban freight alone is forecast to grow by nearly 60 per cent) over 20 years to 2040 (TIC 2019, p. 6). Higher productivity growth will allow this freight task to be delivered more efficiently and safely, reducing the number of heavy vehicles on roads. As such, productivity across all modes of transport is of critical importance, particularly in the freight supply chain.

In some cases, lifting productivity growth will require a redesign of safety regulation, allowing for greater use of outcomes-based and risk-based regulation, as well as greater scope for private sector innovation. In other cases, governments will need to introduce reforms to related policy areas. And while the national safety regulators are important partners in improving productivity, much of the required action will need to come from the three levels of government. As such, it is unlikely that large productivity benefits will be realised in the absence of broader reforms, as outlined below.

10.2 Driving productivity through safety regulation

A significant proportion of the regulation faced by transport businesses is related to safety. While there is no inherent trade-off between productivity and safety, regulation aims to ensure that productivity is not pursued at the expense of safety. At times, such regulation can form a barrier to innovation, or can increase compliance costs unnecessarily. This makes it important to consider how the design of safety regulation can contribute to productivity growth.

The role of safety regulation and regulators in driving productivity

Stakeholders have raised a range of issues about how a productivity agenda should be pursued through the freight supply chain, including whether the Office of the National Rail Safety Regulator (ONRSR) should have a similar productivity remit to the National Heavy Vehicle Regulator (NHVR) (box 10.1).

In heavy vehicle transport, the NHVR has both a safety and productivity remit — largely due to its role in facilitating aspects of road access management, which directly concerns both safety and productivity. The NHVR is only able to affect heavy vehicle productivity to the extent possible through its functions, including giving effect to the Heavy Vehicle National Law (HVNL), administration of access approvals, operator accreditation and Performance-Based Standards (PBS) (chapter 7). In addition, the NHVR may also influence productivity through its general approach to safety regulation (for example, minimising compliance costs).

Box 10.1 Stakeholder views on productivity and the Rail Safety National Law

As noted by the South Australian Freight Council:

While the RSNL is clearly delivering excellent safety outcomes, there is a gap in relation to productivity that they could potentially assist in. (sub. 6, p. 5)

Many believe that change is required to address the gap in productivity:

... it is felt that the ONRSR's focus is too narrow, and in addition to safety the regulator's remit should be broadened to include productivity. (Freight and Logistics Council of WA, sub. 22, p. 5)

... ONRSR has not encouraged rail infrastructure managers to pursue productivity or efficiency reforms to harmonise rail safety requirements, interoperability of systems or greater technological innovation. This is because unlike its heavy vehicle counter-part, it does not have productivity and efficiency enshrined in its legislative objectives. ... the Commission should [r]ecommend the reform of the ONRSR to include a productivity and efficiency mandate similar to the National Heavy Vehicle Regulator. (Pacific National, sub. 24, pp. 3–4)

A common observation from ARA's freight members in the industry workshops in the development of this submission was the need for ONRSR to broaden its remit to incorporate efficiency and productivity of the rail sector. (Australasian Railway Association, sub. 26, p. 29)

[ONRSR should be] refashioned to not just maintain a focus on safety compliance and enforcement, but also the timely advancement of much-needed efficiency and productivity initiatives in the rail freight sector ... ONRSR has demonstrated strong commitment and leadership to improving rail safety, and FORG would like to see the Council broaden the vision of the agency to not only continue to deliver safe railways, but also help industry enhance efficiency and productivity. (Freight on Rail Group, sub. 8, p. 5)

On the other hand, there is a risk that productivity may come at the expense of safety:

ONRSR's focus should remain on delivering effective safety outcomes in connection with its core responsibilities. Efficiently delivering improved safety outcomes will, in Arc's view, lead to increased productivity outcomes. Arc is of the opinion that requiring ONRSR to focus on productivity in conjunction with rail safety may lead to compromised safety outcomes, as there are likely to be situations in which improving safety outcomes may come at the cost of productivity, i.e., it may not be possible to avoid conflict between productivity and safety outcomes. (Arc Infrastructure, sub. 17, p. 4)

The Rail Industry Safety and Standards Board believes that ONRSR can affect productivity outcomes through the avenues already available to it:

Productivity is affected by many matters and ONRSR can play a role through, for example, ensuring the Rail Safety National Law (RSNL) is truly national. RISSB believes the best way to encourage increased productivity in rail is to provide the opportunity for flexibility in implementing new systems and technologies. ONRSR cannot directly influence industry productivity but they should have a responsibility to ensure their regulatory activity does not unnecessarily inhibit changes industry seek to make to achieve productivity. (sub. 9, p. 8)

Various other decisions related to heavy vehicle productivity, including some aspects of access regulation, are beyond the scope of the NHVR. Infrastructure managers affect productivity in their roles as access managers and infrastructure providers. Governments set policy via the national laws and regulations, as well as other relevant instruments.

In rail, ONRSR is solely a safety regulator, with no remit to improve productivity (although productivity is stated as a guiding principle in section 3(3)(a) of the Rail Safety National Law (RSNL)). Given that rail infrastructure access lies outside the scope of the RSNL, the direct justification of a productivity remit for the NHVR does not apply to ONRSR. ONRSR

can affect rail productivity only to the extent possible via improving rail safety outcomes and reducing compliance costs associated with safety regulation. Indeed, several tools for influencing productivity lie with rail infrastructure managers, governments, and industry generally.

Whether or not they have an official productivity remit, safety regulators can contribute to productivity growth in two specific ways while regulating for safety.

- The first involves imposing minimal (but efficient) costs on industry. This not only requires regulators to be aware of compliance costs (chapter 7), but to also ensure efficiency in administrative costs and cost recovery (discussed later in this section). The efficiency of both compliance and administrative burdens can also be improved by taking a risk-based approach to compliance and enforcement (recommendation 9.2).
- The second (and potentially more significant) role for safety regulators in driving productivity involves pursuing safety objectives in a way that minimises barriers to innovation. This model is most advanced in rail, where ONRSR's system of providing assurance to safety management systems allows industry to achieve efficiencies through innovation. This is exemplified by ONRSR's approval of innovative solutions, including by the mining industry in the Pilbara (ONRSR sub. 21, p. 12). Similar mechanisms are also likely to be valuable if applied in a suitable manner to heavy vehicle regulation.

Balancing prescription and flexibility in the HVNL

As discussed in chapter 9, striking the right balance between prescription and flexibility can help to minimise compliance costs without diminishing safety. It can also provide avenues for industry to innovate, improving the management of safety risks. Several heavy vehicle stakeholders have commented on the degree of flexibility and prescription in the HVNL (box 10.2). There is likely to be value in further progression toward a tiered system in heavy vehicle regulation.

In some respects, the HVNL already allows some flexibility and contains aspects of a tiered system. For example, the Heavy Vehicle Accreditation Scheme operated by the NHVR gives businesses some flexibility to operate outside of prescribed regulations, although this is limited to specific modules (discussed in chapter 6). In addition, heavy vehicle operators often implement safety management systems, although they generally remain subject to the prescription of the HVNL (NTC 2019a). The National Transport Commission's (NTC) review of the HVNL is a timely opportunity to consider how to redesign regulation in the sector, not simply to adjust existing mechanisms.

The HVNL should be amended to further progress heavy vehicle regulation toward a tiered system. The system would need to reflect the varied preferences and capabilities of operators: some may prefer a clear set of prescriptive regulations; some may prefer limited flexibility; and others are likely to benefit from more holistic safety management systems (figure 10.2).

Box 10.2 Prescription and flexibility in the HVNL?

Participants in this inquiry have expressed support for a more flexible heavy vehicle regulatory regime.

The current HVNL is predominantly prescriptive, providing limited flexibility in terms of how the rules are applied and implemented. The ability to innovate via new technologies and methods can be restricted when an overly prescriptive approach is taken. This, in turn, can limit the adoption of improvements to safety and productivity (National Farmers' Federation, sub. DR48, p. 11)

[T]he HVNL does not have the flexibility needed to regulate the diversity of freight types and tasks and differing compliance capacities of operators. (Motor Trade Association SA/NT, sub. DR 47, p. 6).

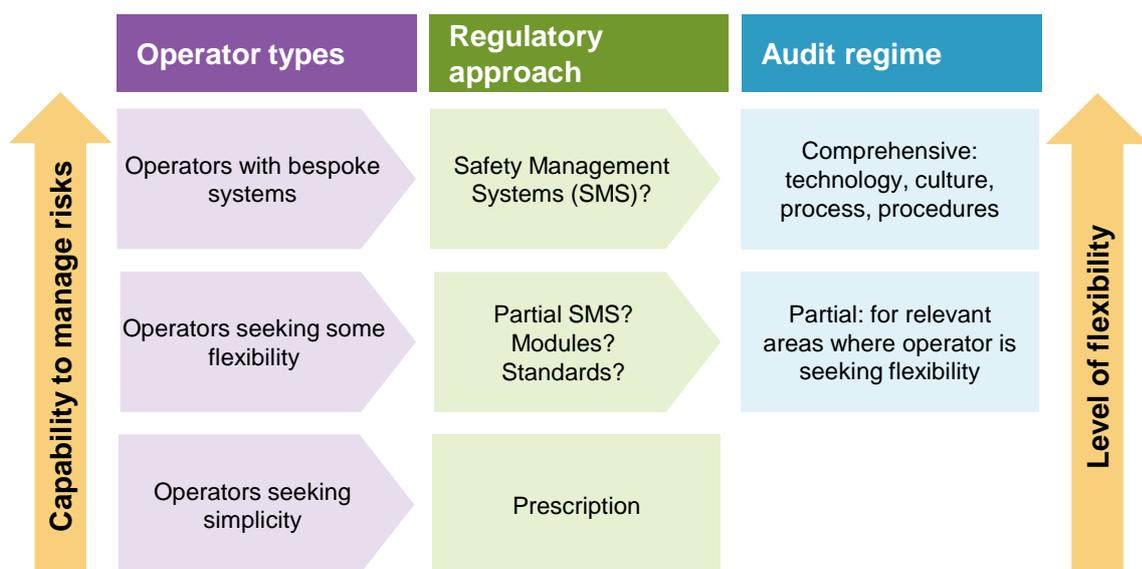
It is vital that we confront past standards and legal structures and build the national transport regulatory framework which ensures that we deliver a far more robust, purposeful and flexible framework in order to meet future national industry challenges. (Victorian Transport Association, sub. 23, p. 3)

Other stakeholders have expressed support for additional flexibility, but underscored the need for prescriptive elements of the HVNL to remain. For example:

- the Australian Trucking Association called for simplified and more flexible prescriptive rules for operators whose business practices and risk profile do not warrant more complex systems, and a separate voluntary, safety-based system for operators that need additional flexibility (sub. DR76, p. 3)
- the Department of Infrastructure Transport, Cities and Regional Development said that:
[a] regulatory regime that strikes a balance between the flexibility of a risk-based approach and the certainty of prescriptive rules is likely to be best placed to deliver on the goals of improving safety while accommodating productivity and innovation. (sub. DR 74, p. 3)

Similar views have been expressed in the NTC review of the HVNL and in subsequent submissions (NTC 2019a).

Figure 10.2 Potential system of tiered regulation in the HVNL



More efficient regulation for operators seeking simplicity

An important aspect of a tiered approach is that operators seeking clarity and simplicity would be able to continue to follow prescriptive regulations. However, this aspect of the HVNL would still require improvements. A frequent criticism of the HVNL is that its prescriptive elements are specified in excessive detail, resulting in a law that is unnecessarily complex (around 800 sections spanning over 700 pages).

As discussed in chapter 9, the prescriptive nature of HVNL legislation also makes it less easily adapted to reflect contemporary issues or new safety-related evidence. This can disincentivise the adoption of more efficient technologies (for example, the Commission has heard from industry that aspects of weight restrictions and vehicle definitions entrenched in the HVNL discourage the use of more efficient technologies, such as twin-steer prime movers). Changes should also be made to make the prescriptive tier of the HVNL simpler for operators to follow and more adaptable to change (recommendation 9.1).

Flexible options for heavy vehicle operators

The tiered system would need to reflect the fact that operators would seek different degrees of flexibility. There are a number of potential mechanisms that could provide various degrees of flexibility (figure 10.2).

Some operators may have limited capabilities to assess and design systems to manage risk. They may opt to generally follow prescriptive regulation, but might prefer flexibility in relation to particular aspects of regulation (such as fatigue management or vehicle maintenance). These operators may benefit from the ability to design alternative ways to manage one particular area of risk alone. Alternatively, they may benefit from off-the-shelf solutions that have been pre-approved by the regulator.

Other operators may wish to implement safety management systems that cover their entire operation. This may be the case for larger operators who may need more complex internal systems (for example operators offering freight services in different modes of transport with large fleets), and are able to commit more resources to formalised, documented internal systems. These operators may benefit from mechanisms like those used in rail regulation, where ONRSR approves operators' safety management systems. The RSNL establishes ONRSR's role and responsibilities (such as assurance, monitoring, and enforcement), and provides mechanisms for public accountability (box 10.3).

In any case, the NHVR would need to be satisfied that any alternative system would provide safety outcomes equivalent to or better than those expected under prescriptive regulations. This would require the NHVR to develop its capabilities with respect to assessing safety management solutions and providing assurance. The NHVR would also need to be given sufficient discretion in legislation, and all parties responsible for enforcement (including the Australian, State and Territory police forces) would require a clear understanding of the new approach.

Box 10.3 ONRSR's role and functions

Role

The NRSR [National Rail Safety Regulator] will:

- (a) administer the national rail safety law and perform the functions and responsibilities conferred/imposed on it by that law;
- (b) secure compliance with the national rail safety law through effective and appropriate compliance and enforcement measures;
- (c) promote improvement of the safe carrying out of railway operations;
- (d) ensure railway operators manage risks associated with their railway operations;
- (e) promote public confidence in the safety of railway operations;
- (f) undertake cost benefit analysis where mandatory decisions have a significant impact on industry; and
- (g) consult with the ATSB [Australian Transport Safety Bureau] where appropriate and practicable to do so.

Functions

In administering the national rail safety law, the NRSR will:

- (a) administer, audit and review the accreditation regime under the national rail safety law;
- (b) work with rail transport operators, rail safety workers and others involved in railway operations to improve rail safety in Australia;
- (c) research, collect and publish information relating to rail safety;
- (d) provide, or facilitate the provision of, advice, education and training in relation to rail safety; and
- (e) monitor, inspect, investigate and enforce compliance with the national rail safety law.

Source: Council of Australian Governments (2011c, pp. A1–A2).

One particularly important design feature of any flexible options to be used in heavy vehicle regulation relates to the auditing regime. It is important that the NHVR is able to ensure that alternative approaches to safety regulation are performing at a level comparable with what would be expected from operators subject to prescriptive regulations (finding 6.4). Of concern is the degree of duplication of audits that are already imposed on heavy vehicle operators (box 10.4).

While some audits may apply to operators that have opted into accreditation schemes, others are implemented by freight customers to ensure they are compliant with Chain of Responsibility requirements (finding 6.3, recommendation 6.2). It may be possible to design a system where an audit by NHVR may be used to provide assurance to others (which could negate the need for further audits), or where the NHVR is able to take assurance from audits carried out by third parties.

Box 10.4 Operators facing multiple audits

Participants to this inquiry raised concern with the proliferation of regulatory assurance mechanisms impacting heavy vehicle operators. In some instances the means of providing regulatory assurance requires operators to undergo audits for three separate heavy vehicle accreditation schemes, workplace health and safety (WHS) and customer-specific requirements. Duplication across these assurance mechanisms imposes an unnecessary compliance cost and operating burden on heavy vehicle operators.

Accreditation schemes

There are three heavy vehicle accreditation schemes: NHVAS, WAHVA and TruckSafe. Operators often enrol in multiple schemes as each scheme offers its own unique commercial benefit (chapter 6). The problem — as raised by participants to this inquiry, the Medlock review and the NTC review of the HVNL — is that there is no recognition between schemes despite broad areas of similarity (for example in maintenance standards and associated audit requirements) (Fellows Medlock and Associates 2018; NTC 2019b). For operators who participate in multiple schemes this imposes an unnecessary compliance cost. Whiteline Transport, an interstate freight operator based in South Australia, provides an example of the burden imposed by duplicative audit processes:

Whiteline is audited on site for all three schemes. Auditors visit so frequently that Whiteline has a dedicated 'compliance room' within its offices. As the schemes overlap in areas, the audits often require the same information, but for it to be presented in different ways. Whiteline invests time and resources to prepare for them, with each audit requiring two or more office staff for two to three days. (NTC 2019b, p. 32)

Customer audits

Even when operators are accredited under regulatory and industry schemes these mechanisms are failing to provide the level of confidence needed by customers and other stakeholders. Accredited heavy vehicle operators are often required to undertake customer-specific audits which often involve the same onsite auditing that is carried out for the accreditation schemes. As noted by participants to this inquiry, the frequency and intensity of customer audits has increased significantly since COR laws were introduced on 1 October 2018 (chapter 6). The burden of customer specific audits is summarised in Toll Group's submission to the NTC review of the HVNL:

Accreditation has not resulted in alternative compliance in the form of reduced road-side enforcement. Nor does it provide customers and prime contractors with "deemed compliance" that hiring accredited operators meets their obligations. Consequently, customers seeking confidence that they have met their obligations as consignors are increasingly seeking refuge in third party audits, some that only partially cover the requirements of the HVNL ... Savvy consultants, seeing a market opportunity, are offering assurance services of varying quality. Operators are subject to multiple audit regimes with limited (if any) mutual recognition as customers deploy their tool of choice. This is costly and wasteful. (Jones 2019, pp. 5–6)

WHS and other regulatory requirements

In addition to accreditation schemes and customer specific audits, operators are also forced to comply with workplace health and safety and other operational-specific regulations (for example, those that relate to the transport of livestock and dangerous goods. While these regulations serve a unique purpose, there are still elements of duplication with other assurance mechanisms.

RECOMMENDATION 10.1 – ALLOW FOR TIERED REGULATION IN THE HVNL

The Heavy Vehicle National Law (HVNL) should be amended to provide the National Heavy Vehicle Regulator (NHVR) with sufficient powers to give effect to a tiered system, in which relatively prescriptive regulation operates alongside outcomes-based options. The amendments should establish clear roles and responsibilities for the NHVR, including adequate discretion, decision-making frameworks, and requirements for monitoring, compliance and enforcement activity.

The system would need to reflect the varied preferences and capabilities of businesses, such that:

- businesses seeking certainty or simplicity can rely on prescriptive regulation (to be streamlined as per recommendation 9.1)
- businesses seeking flexibility to operate outside of prescriptive regulation, while meeting agreed safety outcomes, can seek assurance from the regulator.

The NHVR should expand its use of assurance model/s to allow businesses to seek flexibility on individual aspects of their operations or more substantially across their operations. The design should recognise that some businesses will be able to design comprehensive safety management systems, while others will benefit from pre-approved 'off-the-shelf' solutions. To the extent possible, the assurance model/s should avoid subjecting businesses to duplicative audit processes.

In order to give effect to this recommendation, legislative change would be required from all governments that are signatory to the HVNL. This process should be led by the Australian Government through the Transport and Infrastructure Council. The NHVR's expanded capabilities would also require adequate resourcing.

These provisions would operate alongside recommendation 9.1.

Cost of regulation to industry

As discussed in chapter 7, one of the ways in which safety regulators can contribute to productivity growth involves imposing minimal (but efficient) costs on industry. To this end, regulators should improve their monitoring and reporting of compliance costs (recommendation 7.1), and ensure that compliance costs for particular activities or businesses are proportionate and commensurate with the risks involved (recommendation 9.2).

It is also relevant to consider the cost efficiency of the regulatory regime. This too can be improved where regulators take a risk-based approach, ensuring that the allocation of their resources is commensurate to safety risks (recommendation 9.2). It also relates to how safety regulators are funded, and the extent to which they recover their costs from transport businesses.

Initial negotiations around the 2009 COAG reforms intended that ongoing regulator costs would be subject to full cost recovery from operators through charges, fees and other levies,

with a progressive move towards full cost recovery in the long term across the States and Territories (COAG 2011a, p. 12, 2011c, pt. 6, 2011b, p. 10). Full cost recovery has not yet been achieved, and each regulator has taken a different approach to achieving full cost recovery for the provision of regulatory services.

In rail, only three jurisdictions are fully funded by industry (ONRSR, sub. 21, p. 29), although the path toward full cost recovery is clear. ONRSR is progressing a cost recovery model for the remaining jurisdictions whereby government contributions are reduced by 5 per cent each year, and industry contributions increase each year by 5 per cent, until the cost of regulation is 100 per cent industry funded. In 2019-20, governments will contribute \$14 million (37 per cent) towards the cost of rail safety regulation (ONRSR, sub. DR68, p. 1).

Under this model for cost recovery, ‘a number of operators have seen this as an increased compliance cost’ (ONRSR, sub. 21, p. 29). However, industry costs may stabilise or decrease over time as ONRSR continues to reduce the costs of regulation ‘via internal efficiencies and significant capital investment within the existing budget’ (ONRSR, sub. 21, p. 1). ONRSR has stated a \$1 million reduction in the cost of regulation in 2017-18 as a result of a reduction in cross-subsidisation as well as the aforementioned measures (ONRSR, sub. 21, p. 1).

The Australian Maritime Safety Authority (AMSA) retains significant government funding due to the challenges faced in its attempts to implement full cost recovery for domestic commercial vessels (chapter 5). Further efforts to move to full cost recovery in domestic commercial vessels have temporarily ceased pending further review in 2020-21, with the Australian Government continuing to provide funding for the provision of regulatory services in the meantime (AMSA, sub. 35, p. 15; MIAL, sub. 14, p. 3). This has led to a situation where the over-recovery from vessels covered under the Navigation Act is cross-subsidising AMSA’s domestic commercial vessel operations (MIAL, sub. 14, p. 3).

There is some degree of cost recovery of regulatory services in heavy vehicles, where operators are levied via a portion of heavy vehicle registration charges. However, it is unclear to what extent these revenues ultimately cover the costs of the NHVR’s service delivery (box 10.5). States and Territories are expected to pass on the regulatory charge, collected from industry via their registration charges, to the NHVR (NTC nd). However, the lack of transparency as to the amount payable by States and Territories to the NHVR (as collected from industry), means that it is difficult to determine whether these amounts are sufficient to cover the costs of regulation. Reporting is based around actual amounts collected and passed on by States and Territories, rather than amounts payable based on the Transport and Infrastructure Council’s (TIC) fee schedule and the number of registrations.

Increased transparency over the degree of cost recovery present in heavy vehicles would be beneficial, to both the NHVR and industry, in determining whether the cost of regulatory services by the NHVR is fully and correctly recovered from industry via the heavy vehicle registration charges.

Box 10.5 Cost recovery for the NHVR

There is little information available as to the actual amount industry pays to fund the NHVR's provision of regulatory services. The amount paid by industry which is passed on to the NHVR to fund its service delivery represents only one component of the heavy vehicle registration fee, payable by heavy vehicle owners. Heavy vehicle registration fees are determined by the Transport and Infrastructure Council (TIC), and reviewed periodically based on COAG pricing principles (NTC nd). TIC also periodically adjusts the regulatory component of the charge 'to reflect the revised National Heavy Vehicle Regulator budget' (NTC nd). However, the registration fees are set out as lump sums, with no decomposition into their constituent parts (including the regulatory charge). Some jurisdictions provide a breakdown of the registration fee on their invoices. For example, an invoice sighted by the Commission from NSW for a multi combination prime mover quoted a registration charge of around \$11 000, of which \$912 was a NHVR regulatory charge (ATA, pers. comm., 5 February 2020). Not all jurisdictions provide such a break down, instead only specifying a single all-inclusive fee (including any administrative fees).

It is assumed that the regulatory charge paid by industry will sufficiently cover the NHVR's service delivery costs (given its basis on NHVR budgets). However, where the regulatory charge is not separately and publicly identified, either by TIC or individual jurisdictions, it is difficult to determine the amount actually paid by industry for this purpose. This lack of transparency may also mean that inaccurate jurisdictional charging is not readily identifiable, leaving open the possibility of systemic over or under recovery.

Australian Cost Recovery Guidelines

The Australian Government Cost Recovery Guidelines (CRGs) set out 'an overarching framework under which government entities design, implement and review cost recovered activities provided on behalf of the Australian Government', applying to 'accountable authorities ... of government entities' and 'non-government organisations affected by cost-recovery' (Australian Government 2014, pp. 4–5), such as the national regulators. The CRGs promote 'consistent, transparent and accountable charging for government activities and [support] the proper use of public resources' (Australian Government 2014, p. 6).

Partial cost recovery, which occurs when less than the full cost of a government activity is recovered, may be appropriate in some circumstances where: charges are being 'phased in'; full cost recovery would be inconsistent with community service obligations endorsed by the Australian Government; the Australian Government has made an explicit policy decision to charge for part of the costs of an activity. (Australian Government 2014, p. 6)

Generally, in a move to cost recovery through fees and levies, the prices of regulated products should incorporate all costs incurred — including the administrative costs of regulation (PC 2001, p. xxix). There are various exceptions to the cost recovery principles listed above; they include cases where goods are informational with public good characteristics, or where cost recovery is not cost effective, inconsistent with policy objectives, or would unduly stifle competition.

The three regulators' cost recovery arrangements are currently not in line with the CRGs, seemingly due to a lack of full cost recovery. In particular, in domestic commercial vessels, there is 'an over-recovery of the Regulatory Functions Levy, collected from merchant shipping, and resulting cross-subsidisation of domestic regulatory activities' (AMSA, sub. 35, p. 15) — as identified by a recent Australian National Audit Office review (ANAO 2019). However, AMSA's cost recovery arrangements are under review and subject to change (as above).

Regarding the NHVR, greater transparency around cost recovery would help to achieve consistency with CRGs, as it would be easier to ascertain whether full cost recovery is in place. The NHVR has undertaken recent work in this area, despite preferring to 'consider appropriate fee arrangements on a case by case basis':

... during 2018-19 the NHVR undertook a review of costs of a number of core service transactions based on the Australian Government Cost Recovery Guidelines to establish base lines and to gauge the cost efficiency and extend of cross subsidisation within service areas. (sub. DR72, p. 12)

The national transport regulators should take approaches to cost recovery that are consistent with the CRGs. These common principles could also minimise the extent to which fees and levies lead to market distortions (for example, prices in freight markets).

FINDING 10.1 – COST RECOVERY APPROACHES VARY ACROSS NATIONAL REGULATORS

Different approaches to cost recovery apply in each of the three modes. The degree of cost recovery reflects the historical differences applying across the States and Territories and between the three modes of transport.

There is a clear phased transition path for the Office of the National Rail Safety Regulator (ONRSR) toward full cost recovery. For the Australian Maritime Safety Authority (AMSA)'s role in regulating domestic commercial vessels, cost recovery is subject to an ongoing review. The National Heavy Vehicle Regulator (NHVR) receives funding from State and Territory Governments, who in turn receive fee revenue related to heavy vehicle registrations, although the degree of cost recovery is unclear.

RECOMMENDATION 10.2 – FUNDING FOR NATIONAL REGULATORS SHOULD FOLLOW EXISTING GUIDELINES

The national regulators should move towards cost recovery arrangements in line with the Australian Government Cost Recovery Guidelines. Consistent arrangements across the three transport regulators will reduce the risk of distorting intermodal choices.

10.3 Improving infrastructure provision and management

One of the most important contributions governments can make to lifting transport productivity is through efficient public infrastructure investment — building new infrastructure while improving and maintaining existing infrastructure. This includes the sound management of infrastructure, either by the private sector or government. It is especially important in network industries such as road and rail.

Building the right infrastructure

Inadequacy in transport infrastructure can cause multiple problems. Not only does it constrain access to parts of the freight network, leading to the use of less efficient routes or equipment, but in aggregate it may reduce the ability of the transport sector to accommodate the projected increases in freight volumes. The strategic challenges for infrastructure managers include consideration of immediate concerns about route access, longer term planning of land use, intermodal competition between infrastructure projects, and interactions between passenger and freight transport.

The Commission's *Public Infrastructure* inquiry examined the institutions and processes that contribute to efficient decisions on infrastructure provision (PC 2014). In the context of roads, infrastructure managers must make decisions about the investment and maintenance of their assets, considering factors such as the current and future freight and passenger flows; the potential impact on public amenity and safety; and the future maintenance needs of any new infrastructure projects. New infrastructure should be provided in the context of detailed asset management plans which find an appropriate balance between new construction and the maintenance of existing assets (Australian Local Government Association, sub. 34, p. 3).

In assessing significant new project investment, it is important that governments undertake transparent cost-benefit analysis to inform project selection while looking across the entire transport network to ensure that the investment achieves the best network-wide returns (boxes 10.6 and 10.7). Decisions made in this area have a significant effect on long-term productivity, as the Commission has previously noted:

... arrangements for road service provision are highly vulnerable to poor decisions and outcomes. The long-lived nature of road assets mean that any sub-optimal decisions can materially, and permanently, reduce community welfare relative to what it would otherwise be. (PC 2017, Supporting Paper 9, p. 12)

In addition, while governments might fund infrastructure projects directly or through public-private partnerships, much of the actual construction and maintenance of infrastructure is undertaken by the private sector. As such, governments must have strong skills in negotiating and managing contracts, to limit optimism bias and ensure that risks are allocated to the parties most able to manage them.

It could also be valuable to reconsider how major infrastructure investment decisions are made on important transport corridors. While road and rail transport are mostly complementary, the two modes often compete on major corridors (particularly in long-distance freight). Government investment in new infrastructure should be technology- and mode-neutral, and be subject to transparent lifetime cost-benefit analysis. Investment should be allocated to projects that have the highest probability of strong net benefits (noting historically common tendencies to overestimate net benefits and to take insufficient account of uncertainty). As the Commission has noted elsewhere, project analysis and decision-making should be independent of project proponents.

Box 10.6 Cost–benefit analysis in transport projects

Cost–benefit analysis is used to assess future projects and the strengths and weaknesses of project options. It aims to summarise a project’s combined costs and benefits to all members of society in a single number.

Costs and benefits that are evaluated in road transport projects include:

- vehicle operating costs (such as fuel, tyres, vehicle repairs and maintenance)
- travel time costs (measured for example by average trip time, or value of freight per hour)
- capital costs (such as design and construction, pavement, and project management)
- infrastructure operating costs (such as maintenance and administration)
- accident costs (such as fatalities, injuries and property damage resulting from crashes)
- environmental externalities (such as noise and pollution).

Network and cross-modal effects may also be important. For example, improving road links could improve the operation of a larger road network, and could affect demand for rail transport. Cost–benefit analysis can be accompanied by transport modelling to examine these effects.

There are further factors to consider in cost–benefit analysis involving heavy freight vehicles (for example, road widening projects and highway upgrades could allow for larger freight vehicles). Freight efficiency benefits that should be considered include the reductions in vehicle movements and driving and loading costs for a given volume of freight moved. These are measured by changing the vehicle composition between the base case and the project case for each heavy vehicle type. Secondary infrastructure works, such as heavy vehicle rest areas, should also be taken into account.

It is important that cost-benefit analysis be transparent (with the assumptions and modelling publicly available) and conducted independently of the project proponent. In undertaking cost-benefit analysis, it is important to recognise optimism bias: the systematic tendency to overestimate the benefits of a project and underestimate its costs. Optimism bias is particularly problematic for complex mega-infrastructure projects and for those deploying new technologies.

Sources: ATAPSC (2018); QLD DTMR (2011), PC (2014).

Box 10.7 Long-term planning to improve infrastructure provision

One of the intended outcomes of the suite of reforms recommended by the Commission's *Public Infrastructure* report was a more coherent, economically justified pipeline of projects (PC 2014, p. 19). As reiterated more recently by the CEO of Infrastructure Australia, the establishment of a more coherent pipeline would benefit not only infrastructure provision, but also investment in other areas (including workers' skills) (Davies 2018, p. 67).

In describing governments' approaches to infrastructure provision, Davies noted that:

It is fair to say we have moved away from long-term planning in recent years and have become very focused on the short term — largely on major projects. (2018, p. 66)

On the latter point, Terrill (2018, p. 57) pointed to data showing that small and medium-sized infrastructure projects across Australia tend to have higher benefit-cost ratios than many of the 'mega projects' that are 'so appealing to so many governments'. This supports extensive research that found a systematic bias towards 'mega projects' which tended to have exaggerated benefits and understated costs (Flyvbjerg 2009; PC 2014, p. 713).

These findings suggest that many of the issues around the planning and choice of infrastructure projects discussed in the Commission's *Public Infrastructure* report, including the importance of transparent cost-benefit analyses, remain relevant.

RECOMMENDATION 10.3 – GOVERNMENTS INVESTING IN INFRASTRUCTURE ON MAJOR FREIGHT ROUTES SHOULD CONSIDER INTERMODAL OPTIONS

When considering the costs and benefits of large-scale infrastructure projects to improve the flow of freight on major routes, governments should consider intermodal options which may assist in managing expanding freight volumes. Governments should be neutral on technology and infrastructure choices, focusing on efficient, long-term outcomes.

Funding infrastructure provision and maintenance

State and local governments must also determine how best to fund infrastructure provision and management. Stakeholders note several issues with existing road funding arrangements, including a lack of a direct mechanism for local government fundraising for road construction and maintenance (ALGA, sub. 34, p. 4), a lack of hypothecation of fuel-based road user and registration charges to service provision by local governments (ATA, sub. 32, p. 18), and a recycling of funding from existing programs for local government services and general access (ALGA, sub. 34, p. 6). This territory is well traversed in work undertaken by many organisations, including the Commission (for example, PC (2014, 2017) and box 10.7).

Two main objectives in designing funding mechanisms for road infrastructure are to:

- achieve adequate funding for the scale of provision and maintenance
- provide links between user valuation of infrastructure and the cost of its provision.

Heavy-vehicle-related charging contributes to both objectives: it provides some link between the economic benefits of heavy vehicle access and their associated road maintenance costs; and contributes significantly to road funding.

In the Commission's 2014 *Public Infrastructure* report, the Commission pointed to the value of road charging but emphasised that it is not a panacea. Road infrastructure will continue to require funding from broader taxation sources. The report also pointed to the importance of governance and institutional structures in delivering increased value (PC 2014, p. 21). In the 2017 *Shifting the Dial* report, the Commission recommended that State and Territory Governments establish Road Funds — initially to better manage heavy vehicle-related revenues and expenditures, and eventually to facilitate broader compositional shifts in road funding sources (PC 2017, recommendation 4.3).

While progress has previously been slow, acknowledgement of the need to change road funding and investment and proposals to apply charging models to heavy vehicle movements are now gaining traction, especially as revenues from fuel excises continue to fall. The Australian Government is trialling mass-distance charging models over 2019 and 2020 (box 10.8). Work has also been undertaken in designing appropriate pricing mechanisms for heavy vehicle charges; it has included public consultation on independent price regulation of heavy vehicle charges, as well as multiple reports into Heavy Vehicle Road Reform and the consideration of multiple price-setting models (DIRD 2018).

The Heavy Vehicle Road Reform agenda is likely to again change the requirements for local governments, if only by changing the systems within which they operate. For example, Farrier Swier (2017) note that it may be valuable in the context of an independent price-setting mechanism for road managers to be organised less like government departments, and more like government-owned corporate entities. There are a number of potential configurations for local governments, as well as a range of important considerations, as discussed in the Commission's *Public Infrastructure* report (box 10.9).

The Commission supports the process of trial and evaluation and the National Heavy Vehicle Charging Pilot. Other associated work underway accords with previous Commission findings and recommendations: specifically, those that stressed the importance of institutional arrangements that better connect road demand and supply.

Box 10.8 Progress has been made on several aspects of Heavy Vehicle Road Reform

The reform of heavy vehicle charging and, more broadly, road funding, is underway. As noted by the Department of Infrastructure, Regional Development and Cities:

All levels of government in Australia are working together to establish a regulated market for the provision of road services to the heavy vehicle industry. The ultimate aim of this reform is an improved customer focus for heavy vehicle road users, linking their needs with the level of service they receive, the charges they pay and the investment of those charges back into road services where feasible. The economic benefits of this reform are estimated to range from \$6.5 to \$13.3 billion over the next 20 years. (DIRDC 2018, p. 6)

The four intended phases for progressing Heavy Vehicle Road Reform include:

- improving transparency of investment, expenditure and service delivery
- implementing forward looking cost base and independent price regulation
- returning charges revenue to road owners based on use
- implementing more direct user charging where appropriate (DIRDC 2018, p. 9).

A small-scale six-month trial, covering 200 vehicles from 12 transport operators, commenced in July 2019. This trial stage was designed in collaboration with governments, industry and expert consultants and is intended to determine whether existing installed telematics technology can effectively measure mass and distance. A second larger trial is due to commence in early 2020, lasting 12 months and covering up to 100 businesses and 1000 heavy vehicles. This larger trial will test a wider range of data collection methods and encourage participation across all sectors of the heavy vehicle industry. In both trials, mock invoices will be issued, but no money collected (DITRDC 2020).

While a regulatory model has not been determined, this too has progressed. For example, Deloitte Access Economics investigated several potential end points for the Heavy Vehicle Road Reform agenda, where:

... each option involves a form of independent regulatory regime by setting a forward-looking cost base to support more cost-reflective and transparent pricing and introduces expenditure accountability. ... A forward-looking approach to setting prices that are reflective of long run efficient costs of road service provision is important for achieving the recovery of efficient costs over the economic life of the road service, avoid distorted price signals and achieve prudent and timely investment decision-making. (Deloitte Access Economics 2017, p. 22)

Progress has also been made on a price-setting model that could be used for heavy vehicle charges:

A Forward Looking (lifecycle) Cost Base (FLCB) for HV charges is an important element of phase two of the HVRR Road Map. ... In November 2016, the Council agreed to the development of a prototype working model for a FLCB based on the Building Blocks Model (BBM) to underpin future HV charge calculations, as part of a package of measures to support phase two of the HVRR. Moving to a FLCB would be a significant change, since HV charges are currently set under the PAYGO approach by establishing a cost base using a seven-year historical average, with the HV portion of total roads costs separated out for recovery through HV charges. (Farrier Swier Consulting 2017, p. 6)

Box 10.9 Different approaches to road asset management

There are multiple broad institutional models that are currently used, or have the potential to be used, in the roads sector.

- *Departmental model* — a model of project selection and management and allocation of road funding by governments, with earmarking of road-related taxes and charges used to fully fund roads on an economically sustainable basis.
- *Road fund model* — project selection, and management and allocation of road funding undertaken by a separate dedicated entity that operates at arm's length from government on an economically sustainable basis. This model currently operates in New Zealand.
 - Local governments could choose to adopt a version of the road fund approach using regional road funds established by aggregations of councils. In Queensland, 17 Regional Road and Transport Groups have been established under the Roads and Transport Alliance — an alliance between the State Government, the Local Government Association of Queensland and local governments. These regional road groups are responsible for prioritising, investing in and delivering regionally significant road and transport infrastructure. In Western Australia, Regional Road Groups provide recommendations concerning funding priorities for various projects, and identify strategic regional issues.
- *Corporatised public road agency model* — public road authorities (integrating all tasks relating to road funding and provision) are run on a more economically sustainable basis using both funding from governments and revenue raised from direct charges on road users, with those charges and road service standards overseen by a regulator. Some countries, including the United Kingdom and Austria, are considering or have established independent companies for the management of their strategic road networks.
 - *Regional Organisations of Councils (ROCs)* are one example of such an arrangement. ROCs are voluntary, geographically-based groupings of local governments which are formed and managed by their members, who collaborate on matters of common interest.
- *Private provision model* — private ownership and provision of roads (for instance, using the road concession model).

Variations and hybrids of these models are also possible. For example, the road fund model could also assign both the tasks of funding and provision of infrastructure services to the one entity, in which case it would have some similarities to the corporatised public road agency model.

Source: PC (2014, p. 307).

The road-reform journey from here

Road funding and regulatory arrangements involve all levels of government, and so effective reform requires sustained commitment by all governments (PC 2017, Supporting Paper 9, p. 3). This appears to be in place at this stage of the Heavy Vehicle Road Reform process, and the Commission supports the direction of this process.

In the absence of a new road funding model, infrastructure investment programs from all governments will continue to be vital for maintaining the road network (chapter 7). These investments could be made more effective by applying clear criteria promoting freight movements and supporting investments to remedy identified weak points in the transport

infrastructure. Government grant programs may not always allocate investments to projects of greatest value, as they tend to favour local government areas with the capacity to make the strongest submission. As a result, the projects selected may not always be those with the greatest net benefits.

As road reform is implemented, and pricing mechanisms are established, these trends are likely to present additional reasons to reform the institutional arrangements around road management. Independent accountability and responsibility for road provision will need to be matched by independent oversight of prices, taking care not to provide incentives for ‘gold-plated’ infrastructure provision. Both arrangements would be supported by better data collection processes, a consistent theme in this report. Such approaches would benefit from both scale (for example, by pooling data) and technical expertise (for example, in data management and analysis).

The challenges ahead in establishing new funding and pricing mechanisms, as well as any associated institutional arrangements, should not be underestimated. It will be important to prioritise thorough implementation processes over defined timelines. As has been the case already, priority should be afforded to processes involving stakeholder consultation, determination of appropriate models and institutional arrangements, and trialling of systems. Governments at all levels will need to maintain their commitment and ownership of the process throughout the establishment of any new institutions and transition to the new framework. They may learn other valuable lessons from the implementation of national safety regulation in transport (chapters 3 and 4).

RECOMMENDATION 10.4 – HEAVY VEHICLE ROAD REFORM MUST CONTINUE

Governments at all levels should maintain their commitment to the Heavy Vehicle Road Reform process through the remaining trial, development, and implementation phases.

Improving the utilisation of transport infrastructure

As the Commission stated in 2017, more efficient use of existing transport infrastructure and better integration of transport services is needed (PC 2017, p. 132). The need for new infrastructure can, at least in part, be offset by improving the use of existing infrastructure. Indeed, some degree of road congestion can be attributed to a lack of timely and incremental improvements of existing infrastructure (which is often eschewed in favour of large new projects).

This has increasingly become a focal point for Infrastructure Australia (Davies 2018, p. 67). One key example relates to congestion, which can reduce productivity in the freight transport sector by hindering access to ports and markets, and increasing the time and cost of transporting goods.

Productivity can be improved by minimising congestion, as noted by iMOVE:

For state and local governments, the question is which investments will allow them to more effectively and efficiently utilise the existing transportation infrastructure. ITS [intelligent transport systems] can potentially save billions of dollars by facilitating better utilisation of existing transportation infrastructure. (sub. 25, p. 18)

The Bureau of Infrastructure, Transport and Regional Economics (BITRE) estimated that road congestion imposed avoidable social costs of \$16.5 billion in Australia's capital cities in 2015 (BITRE 2015, p. 1). These costs have risen over time as Australia's population has grown and become increasingly concentrated in cities, and are predicted to exceed \$30 billion per year by 2030 (BITRE 2015, p. 1). The Commission estimates that better transport asset utilisation would permanently increase output by around 0.7 per cent of GDP in the long run, aggregated over all capital cities (PC 2017, p. 137).

Congestion policies

The Australian Government committed an additional \$3 billion (bringing total funding to \$4 billion over 10 years) to the *Urban Congestion Fund* in the 2019-20 Federal Budget. The fund is designed to support projects that reduce congestion around 'pinch points' in major urban areas and improve 'last mile' access to ports, airports, employment and freight hubs (DITCRD 2019). However, reducing congestion may require more than building additional transport infrastructure.

Shifting the Dial showed that recent major transport network augmentation and investment projects in major cities were likely to have provided some relief on congestion in specific areas (PC 2017, p. 135). However, traffic engineering theory suggests that benefits from increased network capacity tend only to occur in the short term and, over time, are often counteracted by induced demand. Survey evidence was consistent with this theory (PC 2017, p. 135).

The challenge of determining how best to address road congestion is exacerbated by the lack of an explicit price for road services, and subsequent lack of transparency around the costs of using and providing road services. Road pricing reform may enable better management of demand and more efficient use of the road network. However, no country or state has fully developed and implemented an operational light vehicle road user charging scheme on a network-wide and non-voluntary basis. Heavy vehicle charging (discussed above) alone will not be sufficient to address congestion, which is mostly caused by the use of passenger vehicles (PC 2017, p. 132). By the same token, congestion charging is not a suitable replacement for heavy vehicle charging, as the two systems differ in their key objectives.

A congestion charge is a form of road user charging whereby prices increase during periods of peak demand. This can improve the efficiency of transport infrastructure use, because the price signal provides an incentive for drivers to travel at off-peak times or use public transport. Congestion charges have been implemented in Singapore, Sweden, Italy and the United Kingdom (Terrill and Ha 2019).

Local government decisions around planning and zoning (discussed above) can also have an influence on congestion levels.

Interplay between passenger and freight transport across modes

The domestic passenger task increased by 8 per cent in the 10 years to 2016 and is estimated to grow an additional 19 per cent by 2026 (NTC 2016, p. 21). The majority of this transport occurs on roads. For example, cars account for the primary method of travel to work for 82 per cent of all workers, followed by public transport¹⁸ (10 per cent) (NTC 2016, p. 15).

Passenger and freight transport compete for capacity between and within road and rail networks. The level of congestion on one network can, therefore, influence the movement of people and goods across all networks. As heavy vehicles and rail compete for some freight tasks, the choice of modal split made by logistics companies can also have an impact on the overall level of congestion.

For rail, direct competition between freight and passenger services occurs mainly in non-urban areas. This is because urban passenger services tend to operate on standalone rail networks. There is significant segregation between freight and passenger train networks in Melbourne, Brisbane, Perth and Adelaide, because the freight trains use standard gauge while urban passenger trains operate on local broad- or narrow- gauge track. By contrast, non-urban passenger services are not standalone networks, and typically share track with urban passenger and freight trains.

Australia's freight rail network mostly carries bulk non-time-sensitive commodities (such as coal and iron ore), while the road network is responsible for the transport of bulk and non-bulk freight and time-sensitive commodities (such as fresh food, construction materials and fuel) (NTC 2016, pp. 14–15). It is, therefore, unlikely that increasing the share of the freight task transported by rail will solve the problem of congestion in cities.

Modal substitutability: moving between road and rail

While road and rail are often complementary modes of transport, they are also competitors (particularly in long distance bulk and non-bulk freight) (NTC 2016, p. 15). Improving the productivity of transport overall means ensuring that each mode carries an efficient proportion of the passenger and freight task. Many submissions to this inquiry discussed intermodal substitution between heavy vehicle and rail freight, and the implications for the productivity and safety of the overall freight task (for example, FORG, sub. 8; Pacific National, sub. 24; ARA, sub. 26; Aurizon, sub. 30; ARTC, sub. 31). Several participants noted that increasing practical substitutability between the modes for end users will encourage greater allocative efficiency between road and rail, whereby rail carries more of

¹⁸ For urban public transport, market share is split between rail (62 per cent), bus (34 per cent), tram (4 per cent) and ferry (1 per cent) (NTC 2016, p. 15).

the road freight task. This could reduce road congestion, pollution and potentially adverse safety outcomes.

An efficient outcome in intermodal freight would need to balance many factors. Governments should ensure that policy and regulation (including infrastructure provision and management) does not result in price distortions in either mode, and that infrastructure provision and management is mode-neutral. To some extent, these objectives may be progressed by improvements to the provision of infrastructure on major transport corridors, where intermodal options are considered (recommendation 10.3). In order to minimise the potential for regulatory costs to cause distortions to intermodal competition, governments and regulators should be committed to minimising compliance costs where possible.

In terms of access arrangements, governments should be open to improving access management in each mode, to better reflect transport infrastructure demand and supply and to adequately fund the maintenance of infrastructure. As discussed above, this involves improved data collection and informed decision-making by infrastructure owners:

It is important that road managers have the data and information available to effectively manage the infrastructure. This supports the value capture of infrastructure, so intermodal terminals and other freight generation points are serviced by the appropriate grade of road infrastructure, thereby facilitating the efficient movement of freight down the supply chain. (Roads Australia, sub. 11, p. 4)

Moreover, there would also be significant benefit from the continuation of Heavy Vehicle Road Reform, particularly as road user charging establishes stronger links between road infrastructure use and supply (recommendation 10.4). To a large degree, better allocative efficiency across different modes of transport results from undertaking incremental reform to ensure efficiency within each mode of transport.

10.4 Heavy vehicle access management

As already discussed, the most substantial productivity gain expected from the COAG reforms was greater access to the road network for heavy vehicles (chapter 7). To this end, the COAG reforms introduced a more accountable and rigorous process for local governments when assessing applications for heavy vehicle access to local roads. The Commission recognises that local government must balance the productivity gains from greater access with other factors such as public safety, amenity and infrastructure costs.

Resourcing road managers for access management

While road infrastructure managers had long held responsibilities for granting heavy vehicle access to local roads, the 2009 COAG reforms formalised their place at the heart of the new decision-making regime. The Heavy Vehicle National Law (HVNL) gives road managers a hierarchy of instruments to manage heavy vehicle access, including individual permits,

pre-approvals, and gazetted notices allowing as-of-right access. However, many road managers lack the resources, expertise and financial capacity to deliver against their role in the reforms — this appears to be particularly true of local government (box 10.10). Ensuring that local governments have adequate resources for their functions as road managers has long been a challenge for state and local governments, and has involved various adaptations and solutions (for example, BTE 1985).

Box 10.10 A lack of skilled resources to process access applications

There is a widespread view that local governments are not sufficiently resourced to process heavy vehicle access applications in a timely or skilled manner:

Councils are not sufficiently resourced to process multiple permit applications and provide access consent as quickly as industry would like. The volume of permits received by council road managers has increased dramatically, particularly within high infrastructure growth areas and major projects. However, councils have received no additional resource[s] and staff have had to add the permit approval task to their existing wider duties. (Municipal Association of Victoria, sub. 15, p. 7)

... the VTA believes that local councils are under resourced and in many cases lack the appropriate and trained staff to address many of the local road management issues in a timely manner. Access processes for larger vehicles are cumbersome for councils and the technical qualification needed to suitably assess applications does not sit within Council administration structure. (Victorian Transport Association, sub. 23, pp. 8–9)

Ongoing issues with attraction and retention of suitably qualified engineering staff results in a loss of knowledge at the local level meaning that the task of assisting councils with capability development is an ongoing exercise. (Local Government Association of Queensland, sub. 33, p. 9)

Unfortunately, the involvement of local government in heavy vehicle access approvals has in many cases failed to contribute to increased efficiency or productivity. ... It is clear that many rural local governments lack the resources and expertise to sufficiently evaluate the impact of road access decisions on the supply chain. For example, many regional shires in South West Victoria have very few b-double gazetted local roads despite the increased production of grain within their regions necessitating heavy vehicle movements. Indeed, within the entire Pyrenees Shire only one small section of the Avoca-Bealiba Road less than a kilometre long is currently gazetted for b-double access. (Victorian Farmers Federation, sub. 18, pp. 1–3)

However, some larger councils can handle the task:

Due to its size, [Brisbane City] Council has the resources, access to data and expertise to process applications quickly and efficiently. However, it recognises that many other local authorities do not have similar resources and any extra assistance by state and Federal authorities to local governments would be beneficial. (Brisbane City Council, sub. 27, p. 3)

Diversity and resourcing

It is difficult to generalise across local governments, given their substantial diversity. The 537 local governments (ALGA 2019) range in size from Brisbane City Council, whose 8233 employees serve over 1.2 million residents across 1342 square kilometres (Brisbane City Council 2019, pp. 9, 40), to the Shire of Peppermint Grove, whose 23 staff service 1636 residents across 1.36 square kilometres (Shire of Peppermint Grove 2018, p. 4). In addition, local governments differ in terms of their functions, legislative and governance frameworks, and associated resourcing. As such, the degree to which local government

resources are sufficient or inadequate for their functions must be assessed on a case-by-case basis.

This diversity translates to access management approaches. Local governments differ wildly in their knowledge of assets, technological capabilities and assessment techniques; some have robust management systems using data sources, while others rely on paper-based systems (MAV, sub. 15, p. 9). Austroads identified several obstacles as preventing timely and justified access approvals (such as differing road assessments by road managers for similar roads, and a lack of engineering expertise to assess infrastructure capacity) (Di Cristoforo 2018).

The efficiency of road access management relies in part on local governments, of varying sizes, possessing sufficient technical skills and resources to perform their role. However, not all solutions will apply easily to all local governments.

Responsibilities have been expanding, but revenue sources remain narrow

In general, there has been a trend of expanding responsibilities for local governments. As noted by the Commission in its report *Shifting the Dial*, local government responsibilities have evolved over the past 30 years to include an increasingly sophisticated set of functions, including engineering and infrastructure, property, planning and development, environment and health, and recreation (PC 2017b, Supporting Paper 16, p. 5). This reflects greater devolution of State and Territory functions over time and the desire of local governments to fill real or perceived gaps. It also results in tension between local preferences and the increasing number of responsibilities and requirements delegated to local government by other levels of government (PC 2017, Supporting Paper 16, p. 6).

In the context of an increasing range of responsibilities overall, the advent of the HVNL ‘elevated’ the role of local governments as asset managers (LGAQ, sub. 33, p. 6). The HVNL formalised their place in a national system and increased the number of permit applications they received.

At the same time, local governments’ revenue has continued to be drawn from three main sources: property rates (their only source of tax revenue), fees and charges on the goods and services they provide, and grants received from other levels of government or the private sector (PC 2017, Supporting Paper 16, p. 9). Local governments do not raise any direct revenues from road users apart from parking fees, with road-related fees and charges levied by the Commonwealth and State and Territory governments (PC 2017, Supporting Paper 9, p. 5).

In aggregate, local governments undertake their work while being more than 80 per cent self-funded and having a narrower revenue base than other tiers of government (ALGA, sub. 34, p. 4). There is ‘considerable variation in the own-source revenue raising capacity of local governments, with those in remote areas having fewer sources of revenue and greater reliance on grants’ (PC 2017, p. 206).

This is exacerbated where State Governments impose restrictions on revenue raising, limiting the ability of local governments to improve their financial capacity alone. To deliver all the services required of them, local governments must either find more revenue (perhaps by increasing local fees and charges or seeking larger grants from other levels of government) or reduce their expenditure (PC 2017, Supporting Paper 16, p. 9).

These trends do not establish whether any local government has a lack of resourcing, relative to its functions. They do show that changes to local government responsibilities have not always come with any new sources of revenue (as is the case with access management under the HVNL). As such, local governments may face increasing disconnection between demand for their services and the funding of these services. This may be problematic in cases where revenue sources are largely local, but potential productivity gains from local government activities (such as access management) extend beyond the local area.

Does resourcing make a difference?

Resourcing levels and processing times both affect procedural efficiency, but the relationship between them is complicated. The NTC found, using NHVR data, that road manager performance was not obviously tied to population and therefore resource levels (2019c, p. 41). Rather, operational and functional differences between road managers were significant: those with high volumes of permit applications tended to make decisions more quickly, regardless of their size. This is supported by anecdotal evidence. For example, as described by the City of Greater Dandenong:

The biggest issue is likely to be when specialised knowledge is required for issue[s] which may not occur often enough (e.g. structural assessments) for local government to justify keeping the expertise and resources on hand. (sub. 3, p. 2)

While it is important for road managers to be sufficiently resourced, this is likely to be easier to accomplish when the nature of the access management task is large and consistent — in other words, where there are economies of scale. This does not obviate the importance of adequate resourcing, and does not provide solutions for local governments for which heavy vehicle access management is infrequent or inconsistent.

The importance of resourcing for road managers goes beyond procedural efficiency, as it also affects whether an efficient level of access is granted overall. As noted above, road managers must balance several objectives; productivity gains associated with access, public safety and amenity, and the cost implications for public infrastructure provision and maintenance. For these decisions to be made well, road managers require adequate technical skills and data. Some stakeholders have suggested that these are lacking, and that many councils have a poor understanding of the engineering and design standards of their own roads (MAV, sub. 15, p. 8). It has been suggested that access decisions from road managers often lack evidence of risks to infrastructure (ATA, sub. 32, p. 18).

FINDING 10.2 – SOME ROAD MANAGERS LACK RESOURCING, EXPERTISE, AND INFORMATION

Some road managers, particularly local governments, lack the in house expertise and resources to assess heavy vehicle access applications. Some also lack essential information on the state and capacity of their road infrastructure. While resourcing is important, more resources alone will not guarantee greater efficiency. Other factors — including access to data and appropriate technical skills, and economies of scale in permit applications — also contribute to greater efficiency.

Other means of improving capacity and capability

Many stakeholders believe that local governments should introduce fees for heavy vehicle access applications, as this would allow road managers to invest in improving their capabilities and resourcing specific to the task (for example, South Australian Freight Council, sub. 6, p. 8; City of Greater Dandenong, sub. 3, p. 3). Depending on the scale of the task for a given infrastructure manager, a fee-for-service regime would also provide an incentive for local governments to undertake the task in a more efficient and productive manner. It would also be consistent with prevailing cost recovery principles: carriers applying for road access stand to gain private benefits (that is, from access) and should thereby be subject to a fee.

At the same time, the use of fees could substantially undermine any incentive for road managers to grant access through alternate means, such as notices (chapter 7). It would be difficult to design a permit processing fee that could adequately cover the resourcing needs for access management, without impeding progress towards as-of-right access via notices.

The NHVR acts as an intermediary between heavy vehicle operators and individual local governments, facilitating the heavy vehicle access approval process. Various stakeholders have suggested that there may be other roles the NHVR could play in building the capabilities of road managers, to better enable the discharge of the statutory obligations imposed on them under the national law (Roads Australia, sub. 11, p. 6). These may include:

- introducing an asset management framework and a system for recording infrastructure data (MAV, sub. 15, p. 6)
- working with road managers to provide guidance on access and resources, including independent bridge and route assessments (MAV, sub. 15, p. 7)
- providing improved data and enhanced technology management support systems, to collect and analyse data to develop a regional freight approach and to more effectively identify and prioritise freight routes (MAV, sub. 15, pp. 7–9)
- giving access to data, via mandatory telematics or other sources, to ensure compliance and aid the planning, delivery and maintenance of road corridors (LGAQ, sub. 33, p. 9).

The NHVR has agreements with two Local Government Associations to collaborate on road access issues. In 2017, the NHVR signed an agreement with the South Australian Local Government Association to work with local governments across the state to ‘improve the permit system and information available at the local level’ and help streamline heavy vehicle access to local government-controlled roads, improving safety and productivity (NHVR 2017). The agreement involved providing local governments with information sessions, training in the NHVR’s Road Manager portal, assistance during the transition of certain permit applications and further route assessment training (NHVR 2017). Similarly, the Local Government Association of Queensland (LGAQ) partnered with the NHVR in 2016 to ‘provide the necessary assistance to councils as they strive to fulfil their role in improving the safety and productivity of the local freight network’ (LGAQ, sub. 33, p. 6). The partnership involves a dedicated NHVR resource at the LGAQ (NHVR 2018, p. 20). The LGAQ described the arrangement as resulting in ‘significant progress’, and has:

... ultimately led to individual councils being empowered to make appropriate access decisions for their local road network considering available funding, condition of existing infrastructure, its capacity to support heavy vehicle movements along and community expectations’. (sub. 33, p. 9)

No other jurisdictions have entered into such arrangements with the NHVR (NHVR 2018, p. 20).

Local government incentives to improve heavy vehicle access management

An alternate perspective on local government capability relates to their own incentives for performance. Generally, local government performance is assessed through local community elections, public scrutiny of processes and finances, State and Territory Government audit processes and, in some cases, regular reporting on agreed performance indicators (PC 2017, Supporting Paper 16, p. 13). However, parties like the heavy vehicle industry, who seek better performance from local governments in relation to a specific task, have a limited ability to effect change through these mechanisms.

Local governments can also be incentivised to build capacity by increasing accountability. Information about the scope, quality and efficiency of service provision should be collected and made accessible. This would allow for better comparison across local governments — pushing them to improve, including with regards to community engagement (PC 2017, p. 207).

To be effective, data on local government performance should be available in a consistent, accessible and easily comparable format to a variety of users — including other levels of government, taxpayers, the local community and industry (PC 2017, Supporting Paper 16, p. 16).

As previously recommended by the Commission, it would be valuable for State and Territory governments to draw on Victoria’s experience and require more meaningful and comparable performance reporting by local governments, providing support for this where needed.

Improving the efficiency of access approval systems

The efficiency of access management outcomes may require different solutions to those aimed purely at improving the efficiency of approval processes. For instance, road managers require the capability for longer term planning, and may also benefit from exploiting different institutional arrangements in order to achieve economies of scale.

A need for institutional change?

Efforts to increase efficiency or capability have sometimes involved the amalgamation of smaller councils into larger entities, allowing for economies of scale in delivering services and for the pooling of resources and technical capabilities. Amalgamations are usually contentious (PC 2017, Supporting Paper 16, p. 7), and improving road access is not a sufficient reason to consider such broad institutional change.

Collaboration and aggregation do not always require wholesale amalgamation (box 10.11). For example, the Australian Local Government Association supports the concept of regional road funding arrangements and the establishment of regional road groups of councils across Australia. Work is being done to develop regional local government and road groups nationally to better support a coordinated approach to road provision and planning (ALGA, sub. 34, p. 6).

Box 10.11 Aggregation for heavy vehicle access in Tasmania

The Tasmanian Government has taken a 'proactive approach' to develop pre-approved networks for restricted access vehicles. This has involved:

... commitment of budget resources and strong collaboration and partnering with Local Government, the heavy vehicle industry and the NHVR. (Tasmanian Government, sub. 41, p. 5)

Funding was provided to engage civil engineers to assess road corridors, bridges and other structures. Overall, the project aimed to assess over 3000 bridges for different vehicle combinations to achieve economies of scale through consolidated action (NTC 2019c). This collaborative approach led to:

- a comprehensive State-wide understanding of road and bridge assets, in the context of heavy vehicle access;
- enhanced and simplified heavy vehicle access across the State Road Network, through pre-consented heavy vehicle networks via gazetted Notices, with a significant reduction in red tape;
- expedient road manager responses which enable faster issue of permits by the NHVR; and
- for the first time in Australia, an on-line tool for heavy vehicle operators to map routes for specific vehicles against pre-consented networks and conditions of access. (Tasmanian Government, sub. 41, p. 5)

The Tasmanian project has garnered significant interest and support from local government associations (for example, MAV, sub. 15, p. 8; ALGA, sub. 34, p. 13), who cite collaborative and streamlined decision-making, increased knowledge about their infrastructure, and quicker and safer freight movement via prompt access permit decisions as benefits.

Another option involves voluntary collaborative arrangements to share resources and provide shared services (PC 2017, p. 206). Regional Organisations of Councils (ROCs) are one such arrangement. ROCs are voluntary, geographically-based groupings of local governments formed and managed by their members, who collaborate on matters of common interest (Gooding 2012, p. 3).

The first ROC was established in northern Tasmania in 1922, and there was a significant increase in the number of ROCs during the 1970s (Marshall, Dollery and Witherby 2003, p. 170). There are now more than 30 major local government regional road groups, involving more than 320 local councils across Australia (ALGA, sub. 34, p. 6), each with different operating models. ROCs range from small unstaffed groupings of councils, concentrating on a small number of issues and projects, to large organisations which play substantial roles in shared service delivery, procurement, advocacy and governance (Gooding 2012, p. 3). ROCs enable smaller neighbouring local governments to achieve economies of scale, and provide centralised resources to draw from when required.

With regard to local governments' heavy vehicle access responsibilities, there is growing support for collaboration between local governments, with an emphasis on centralised resources (Victorian Farmers Federation, sub. 18, p. 3; City of Greater Dandenong, sub. 3, p. 3). The success of such arrangements depends on the size, number and financial position of participating governments, as well as the level of commitment and leadership involved (PC 2017, Supporting Paper 16, p. 7). In general, there is likely to be value in centralising access management resources across multiple local governments.

In addition, secondments and staff movements between levels of government and the private sector can broaden staff skills and experience, and can develop capability both at an individual level and across the workforce more broadly (PC 2017, Supporting Paper 16, p. 13).

RECOMMENDATION 10.5 – ADEQUATE RESOURCING FOR ROAD MANAGERS

The Council of Australian Governments should ensure that local governments have access to the financial and technical capacity they need to perform their role as asset managers for local roads. Transparency and accountability for performance should accompany any additional support, particularly with respect to access permit processing times and the use of notices to gazette heavy vehicle routes.

Long-term strategic planning to improve access management

The Commission has noted that local governments should continue to gain a better understanding of their asset and infrastructure base (2017, Supporting Paper 9, p. 20).

For example, with improved data on road assets and projections of future traffic flows, local governments could better plan for maintenance and renewal (MAV, sub. 15, p. 8). In

addition, the efficiencies gained from longer-term planning may help reduce road managers' overall resourcing requirements (City of Greater Dandenong, sub. 3, p. 3). A better understanding of road assets and traffic flows could help local governments to increase their use of as-of-right, gazetted or pre-approved heavy vehicle access, thus improving the productivity of the industry as well as asset managers. The importance of data and technology in improving productivity outcomes in transport is further discussed in section 10.5.

Access permit decisions focus on single events, and are reactive to the needs existing in a particular time and place. One risk of focusing resources on this task alone is that it may take priority over longer term strategic planning. Such planning would allow road managers to better understand how infrastructure management should adapt to changes in freight flows and volumes, as well as to new technologies (Australian Academy of Technology and Engineering 2019, p. 6). While this is true for access arrangements, it is particularly relevant to the provision, maintenance, and use of roads.

10.5 Harnessing data and technology to improve productivity

Advances in transport and data technologies, as well as improved data collection and sharing methods facilitated through new data infrastructure, can dramatically improve productivity in transport.

Minimising barriers to new technology

The transport sector is experiencing considerable technological innovation, with the development of a range of new technologies such as intelligent transport systems, autonomous technologies, new models of ownership and new physical means of transport (chapter 8). These new areas of innovation and development are ways in which transport productivity may be enhanced.

Barriers to the uptake of new technologies are mostly an issue in heavy vehicle transport. While rail locomotives also vary in age, the rate of fleet renewal¹⁹ and the risk-based regulatory regime are both conducive to the use of new technologies. As a priority, the Australian Government should address specific issues identified as significantly hindering productivity or safety, such as heavy vehicle width and mass limits that may discourage the use of newer, safer technologies.

As discussed in chapter 8, all vehicles must comply with the Australian Design Rules (ADRs). These national performance-based standards cover issues including vehicle safety,

¹⁹ The locomotive fleet has become younger in recent years. As of 2018, about half the fleet was aged 11 years or less; in 2016, about the same proportion was aged 16 years or less (BITRE 2016, 2018).

structure, lighting, noise, emissions and braking (DITCRD 2018). However, the existence of the ADRs may hinder technological innovation and development in Australian heavy vehicles. This is because new ADRs (as well as the review of existing ADRs) are subject to a lengthy formal process, which involves stages of consultation with key stakeholders, public comment, and a possible vote by TIC members (DITCRD 2018). The Commission has recommended amending how ADRs are used in relation to transport technology (recommendation 8.1).

As discussed in chapter 7, the NHVR is responsible for accreditation schemes that give drivers access to flexible options including concessional mass limits, higher mass limits, and the PBS scheme for heavy vehicles. The scheme aims to offer industry ‘the potential to achieve higher productivity and safety through innovative and optimised vehicle design’ (NHVR 2019a). Fulfilment of the PBS for heavy vehicles allows compliant vehicles to sidestep ADR processes (chapter 8).

According to the NHVR, there are now over 9500 PBS-approved combinations (NHVR (unpublished)), offering significant productivity benefits:

PBS vehicles are designed for the task they need to undertake rather than their conventional counterparts, meaning more freight can be moved in the same number of trips ... PBS combinations offer significant productivity benefits, including: productivity improvements of 15 – 30%, [and] up to 260 million fewer kilometres travelled annually, compared to conventional vehicles. (NHVR 2019b, p. 5)

It will be vital for schemes such as the PBS to provide an efficient gateway for new heavy vehicles to be used on public roads, while ensuring some form of balance between the objectives of productivity, safety, and public amenity.

Data as a key enabler of policy reform and improved productivity

Informed planning and decision-making by government requires a solid evidence base, comprising of both research and data. Having access to sufficient data to inform and facilitate policy is an overarching issue, not only relevant to transport.

In the context of transport, the Transport and Infrastructure Council described data as:

... an additional resource that can be analysed to improve planning, investment decision-making, and transport operations ... data can also support the design and delivery of new infrastructure ... improving investment and operational decision-making over the entire life of an asset’. (TIC 2016, p. 11)

As discussed in chapter 8, data in the transport space can be used for many efficiency and productivity enhancing purposes: optimising freight routes and schedules; congestion monitoring and management; enabling the use of intelligent transport systems and autonomous technologies; improving regulatory compliance and enforcement; improving record keeping and reducing operator paperwork requirements; and enabling and enforcing dynamic road pricing.

Data will also have a key role in the future reforms discussed earlier in this chapter. In heavy vehicle access management, data can provide local governments and asset owners with more information as to the number and sizes of the heavy vehicles operating on their roads, as well as the routes they take. This information enhances their capacity to make access decisions, and allows governments to adequately plan and implement strategies aimed at improving the productivity of their road networks.

Data will allow for more informed decisions by infrastructure owners and managers around infrastructure planning, investment and funding, as well as the prioritisation of different infrastructure uses based on past and projected trends. Data relating to traffic flows and the condition of key infrastructure assets will enable the prioritisation of investments, and inform the setting of mass- and distance-based charging. The importance (and absence) of such analysis has been noted by participants to this inquiry (Australian Logistics Council, sub. 12, p. 9). Governments should prioritise the use of data to include coordination between road users and infrastructure managers, not only to inform the provision and management of road infrastructure but also to inform decisions around road access for heavy vehicles (recommendation 8.2).

A Public consultation

The Commission has actively encouraged public participation in this inquiry. This appendix outlines the consultation process.

An advertisement was placed in *The Australian* newspaper and a circular was sent to identified interested parties following receipt of the terms of reference on 5 April 2019.

- An issues paper was released on 17 May 2019 to assist those wishing to make a written submission to the inquiry. The Commission received 44 submissions prior to the release of the draft report. A draft inquiry report was released on 12 November 2019 and 38 submissions were subsequently received: a total of 82 submissions were received throughout the inquiry (table A.1). These submissions are available online at www.pc.gov.au/inquiries/completed/transport/submissions.
- Consultations were held with representatives from major stakeholders in the transport industry, including truck drivers around regional Australia (table A.2).
- The Commission held public hearings in Sydney, Brisbane, Canberra and Melbourne during January and February 2020 (table A.3).
- A roundtable on heavy vehicle regulatory reform was held in February 2020 in Melbourne (table A.4).
- The final inquiry report was delivered to the Australian Government on 8 April 2020.

The Productivity Commission wishes to thank all participants for their contribution to the inquiry.

Table A.1 Submissions

<i>Participants</i>	<i>Submission number</i>
Accord	20
Arc Infrastructure	17, DR57
Australian Academy of Technology and Engineering	4
Australian Institute of Marine Surveyors (AIMS)	DR73
Australian Logistics Council (ALC)	12, DR61
Australian Local Government Association (ALGA)	34, DR75
Australian Maritime Safety Authority (AMSA)	35, DR71
Australasian Railway Association (ARA)	26, DR59
Australian Rail Track Corporation (ARTC)	31, DR63
Australian Road Research Board (ARRB)	DR49
Australian Small Business and Family Enterprise Ombudsman	29
Australian Transport Safety Bureau (ATSB)	39, DR58
Australian Trucking Association (ATA)	32, DR76
Aurizon	30, DR78
Blake, Jason	1
Brisbane City Council	27, DR45
City of Greater Dandenong	3
Cleeland, John	DR80
Co-operative Bulk Handling Limited (CBH)	13, DR66
Department of Infrastructure, Transport, Cities and Regional Development	DR74
Department of Transport and Main Roads (QLD) (DTMR)	28
Di Mauro, Linda	2
Electric Vehicle Council	DR67
Freight and Logistics Council of WA	22
Freight on Rail Group (FORG)	8
Gas Energy Australia	5
Grain Trade Australia (GTA)	38, DR65
Heavy Vehicle Industry Australia (HVIA)	DR70
iMOVE	25
Independent Pricing and Regulatory Tribunal of New South Wales (IPART)	19
Jeffrey, Shane	DR50
Local Government Association of Queensland (LGAQ)	33, DR51
Maritime Industry Australia Ltd (MIAL)	14, DR56
Maritime Union of Australia (MUA)	37, DR77
Minister for Transport, Planning (WA)	43
Motor Trade Association of South Australia (MTA-SA)	42
Motor Trade Association of South Australia/ Northern Territory (MTA-SANT)	DR47
Municipal Association of Victoria (MAV)	15
NT Government	DR64
National Farmers' Federation (NFF)	36, DR48
National Heavy Vehicle Regulator (NHVR)	16, 44, DR72
National Road Transport Association (NatRoad)	7, DR55, DR82

(continued next page)

Table A.1 (continued)

<i>Participants</i>	<i>Submission number</i>
Office of the National Rail Safety Regulator (ONRSR)	21, DR68
Office of Transport Safety Investigations (OTSI)	40
Pacific National	24, DR62
Rail Industry Safety and Standards Board (RISSB)	9
Rail, Tram and Bus Union (RTBU)	10, DR54
Red Meat Advisory Council (RMAC)	DR52
Roads Australia	11
South Australian Freight Council (SAFC)	6, DR46
Tasmanian Government	41
Tooth, Richard	DR69
Transport Safety Victoria (TSV)	DR60
Victorian Farmers Federation (VFF)	18, DR53
Victorian Transport Association (VTA)	23
Western Australian Local Government Association (WALGA)	DR79
Western Australian Government	DR81

Table A.2 Consultations

Adelaide Flinders Port Holdings
Agforce
Arc Infrastructure
Aurizon
Australasian Institute of Marine Surveyors (AIMS)
Australasian Railway Association (ARA)
Australian Logistics Council
Australian Maritime Safety Authority (AMSA)
Australian Rail Track Corporation (ARTC)
Australian Transport Safety Bureau (ATSB)
Australian Trucking Association
Austroads
Boland, Kellie
Bureau of Infrastructure, Transport and Regional Economics (BITRE)
Centres for Road Safety and Maritime Safety
Chamber of Minerals and Energy (WA)
Commonwealth Scientific and Industrial Research Organisation (CSIRO)
Department of Infrastructure, Logistics and Planning, Northern Territory
Department of Infrastructure, Transport, Regional Development and Communications (DITRDC)
Department of Planning, Transport and Infrastructure, South Australia (DPTI)
Department of Premier and Cabinet, Tasmania (DPAC)
Department of Premier and Cabinet, Victoria (DPC)
Department of State Growth, Tasmania
Department of Transport, Victoria
Flinders Ports Holdings
Freight and Logistics Council
Harris, Peter
Heavy Vehicle Industry Australia (HVIA)
Landbridge Darwin Port
Linfox
Local Government Association of Queensland (LGAQ)
Local Government Association of South Australia (LGASA)
Local Government Association of Tasmania
Local Government Association of the NT (LGANT)
Marine and Safety Tasmania

(continued next page)

Table A.2 (continued)

Maritime Industry Australia Ltd (MIAL)
Maritime Union of Australia (MUA)
Municipal Association of Victoria (MAV)
National Heavy Vehicle Regulator (NHVR)
National Transport Commission (NTC)
National Transport Insurance (NTI)
NT Department of Infrastructure, Planning and Logistics (DIPL)
NT Road Transport Association
NT Worksafe
National Transport Commission (NTC)
NSW Government
Office of the National Rail Safety Regulator (ONRSR)
Pacific National
Professional Fishermen's Association
Queensland Department of Transport and Main Roads (DTMR)
Rail Industry Constructions
Rail Industry and Safety Board (RISSB)
Roads and Maritime Services, New South Wales
Shipping Australia Limited
Stone, Marla
South Australian Freight Council
Sydney Trains
Symons Clarke
Tasmanian Transport Association
Tasports
TasRail
Toll Group
Torrens Transit Group
Transport Certification Australia
Transport for Victoria
Transport Safety Victoria (TSV)
Transport Workers Union (TWU)
Western Australian Department of Transport
Wildcatch Fisheries
Woolworths
Worksafe

Table A.3 Public Hearings

Participants

30 January 2020 – Sydney

Office of the National Rail Safety Regulator (ONRSR)
Maritime Union of Australia (MUA)
Local Government NSW
Richard Tooth

31 January 2020 – Brisbane

National Heavy Vehicle Regulator (NHVR)
Local Government Association of Queensland (LGAQ)
Queensland Trucking Association (QTA)
Heavy Vehicle Industry Australia (HVIA)
Office of the National Rail Safety Regulator (ONRSR)

4 February 2020 – Canberra

Australian Trucking Association (ATA)
NatRoad
Australian Transport Safety Bureau (ATSB)
Australasian Railway Association (ARA)
Australasian Institute of Marine Surveyors (AIMS)
Australian Local Government Association (ALGA)
Lauchlan McIntosh
Australian Maritime Safety Authority (AMSA)

5 February 2020 – Melbourne

Pacific National
Australian Road Research Board (ARRB)
Grain Trade Australia (GTA)
Victorian Farmers Federation (VFF)
Office of the National Rail Safety Regulator (ONRSR)
Australian Academy of Technology and Engineering

Table A.4 Roundtable

Participants

National Heavy Vehicle Regulator

Department of Infrastructure, Transport, Regional Development and Communications

Australian Transport Safety Bureau

Transport Certification Australia

National Transport Insurance

Chartered Institute of Logistics and Transport

Department of Transport, Victoria

Queensland Department of Transport and Main Roads

Main Roads WA

Tasmanian Department of State Growth

Roads ACT

Toll Group

Murphy Transport Solutions

Australian Logistics Council

Heavy Vehicle Industry Australia

B Analysing transport safety outcomes and heavy vehicle productivity

Qualitative and quantitative evidence was used to assess the effects of the national transport reforms on safety and productivity. Transport industry representatives, regulators and other government agencies provided evidence through their submissions to the inquiry and through consultations. The Commission is grateful to the following organisations for their assistance in accessing and understanding their data holdings, and in providing permission to publish analysis using unpublished data:

- the Bureau of Infrastructure, Transport and Regional Economics (BITRE)
- State and Territory road safety authorities
- the National Heavy Vehicle Regulator (NHVR)
- the Office of the National Rail Safety Regulator (ONRSR)
- the Australian Maritime Safety Authority (AMSA)
- Transport Certification Australia (TCA).

Despite accessing the best available data, much of the data was incomplete or inconsistent. Further, isolating the impact of regulatory reform from the many factors at work is difficult.

The analysis of transport safety is set out in sections B.1 and B.2 and analysis of heavy vehicle productivity is set out in sections B.3 and B.4.

B.1 Transport safety data

The assessment of safety outcomes is set out in chapter 6, using published and unpublished data. Published sources of data include:

- fatalities data published by the ABS (2019b)
- heavy vehicle crash data published by Transport for New South Wales (2019)
- rail safety data published by ONRSR (2019).

The sources of unpublished data are described in table B.1.

Table B.1 Unpublished sources of transport safety data

<i>Dataset</i>	<i>Source</i>	<i>Description</i>
National Crash Database (NCD)	Bureau of Infrastructure, Transport and Regional Economics (BITRE)	<p>BITRE developed the NCD in 2010 to support the annual reporting of progress against the <i>National Road Safety Strategy 2011–2020</i> targets. State and Territory governments supply fatality and injury crash data, which BITRE combines into the NCD. As part of this reporting function, BITRE has worked with jurisdictions to develop new indicators and a set of standardised national indicators (including crash severity, and the number and type of vehicles involved). However, there remain some differences in other indicators such as ‘crash involving injury’.</p> <p>State and Territory governments provided the Commission with permission to access unit record data and publish data and analysis from the NCD. Data were provided for the period 2008–2018.</p>
Rail safety	Office of the National Rail Safety Regulator (ONRSR)	<p>ONRSR has published annual rail safety reports since 2012-13. Until the 2018-19 report, data were typically published only for States and Territories that signed up to the Rail Safety National Law and for the period since their enrolment.</p> <p>ONRSR provided additional (unpublished) data on fatalities, level crossing collisions, running line derailments, running line collisions, train kilometres travelled and track kilometres managed for the period 2013-14 to 2018-19, and data on serious injuries for 2016-17 to 2018-19. Data for Victoria, Queensland and Western Australia are from 1 July 2014, while data for other jurisdictions cover the full period. Some of these data were collected by State and Territory regulators for periods that pre-dated ONRSR’s regulatory oversight in those jurisdictions.</p> <p>Both published and unpublished data from ONRSR exclude Victorian operators regulated under State legislation for the whole reporting period.</p>
Maritime incidents	Australian Maritime Safety Authority (AMSA)	<p>AMSA provided maritime incident data for the period 1992–2020. Much of this was inherited from State and Territory agencies as part of the transition to the national regulator and for that reason AMSA noted it could not guarantee the completeness or quality of earlier data. Incident data for domestic commercial vessels (DCVs) were provided in four datasets (A, B, C and D) between September 2019 and February 2020. There are inconsistencies in the data within and across these datasets and, in some instances, duplication of data for maritime incidents. AMSA also noted that updates to its data can occur over time.</p> <p>Dataset A contains information on maritime incidents for March 1992–November 2017 collated through the pre-existing National Marine Safety Committee reporting process.</p> <p>Dataset B contains information on maritime incidents over the period July 2013–December 2017, for which AMSA has been the national regulator. Maritime incidents were collated by AMSA using their own reporting process with the National Marine Safety Committee approach as a base.</p> <p>Dataset C contains information on maritime incidents reported directly to AMSA, using an updated approach to that used for datasets A and B, covering the period September 2017–January 2020.</p> <p>Datasets A, B and C include unit level indicators for: jurisdiction, date, vessel type and accident type (for example collision, grounding, capsizing). Dataset C contains additional information on severity, vessel activity at time of incident, operational area category, how the incident occurred, the assumed causes and AMSA’s actions in response to the incident. There are also substantially fewer missing values in dataset C.</p> <p>Dataset D contains all DCV-related fatalities covering the period May 2013–January 2020. This dataset was cleaned and standardised by AMSA and contains a free text field describing the circumstances of each incident and indicators for the incident type (such as operational, illness/heart attack and snorkelling/scuba diving).</p>

The National Crash Database (NCD) was used to examine the impact of the Heavy Vehicle National Law (HVNL) on safety. The method used to assess the impact of the HVNL on safety is discussed in section B.2.

National rail safety data were sourced from annual safety reports prepared by ONRSR and unpublished data provided by ONRSR. A causal impact of the introduction of the Rail Safety National Law on safety outcomes could not be investigated due to the lack of pre-reform data and the staggered sign-up of Australian States and Territories (henceforth, jurisdictions).

AMSA provided maritime incident data in four separate datasets (table B.1). The Commission standardised and merged a number of these datasets to examine non-fatal incidents, but the task was complicated by inconsistent reporting on variables both within and across datasets. Analysis investigating the possible impact of the Maritime Safety National Law on maritime safety outcomes was not undertaken because of: data inconsistencies, the lack of a valid counterfactual and the fact that the total number of maritime fatalities was relatively small. Further, unlike in the heavy vehicle and rail sectors, there is a lack of data to control for changes in the level of maritime activity, such as a measure of total nautical miles travelled over time.

B.2 Heavy vehicle safety

A principal focus of the HVNL and the NHVR has been to improve the safety of the heavy vehicle sector. Heavy vehicle safety has improved, with the number of heavy vehicle crashes involving injury or death per kilometre travelled decreasing by about 40 per cent between 2009 and 2019 (chapter 6).

Of interest is whether there is evidence to conclude that the HVNL has contributed to the reduction in crash rates.

This is a challenging task because there is no way to know the trends in heavy vehicle crash rates that would have prevailed in the absence of the national transport reforms. However, there are two comparisons that can provide counterfactual scenarios:

- heavy vehicles in Western Australia and the Northern Territory — the two jurisdictions that did not sign up to the HVNL
- non-heavy vehicles (such as light commercial vehicles and cars) in HVNL jurisdictions. These operated under similar conditions to heavy vehicles (in terms of road infrastructure, maintenance and road safety awareness campaigns, for example) but were not subject to the heavy vehicle reforms.

Heavy vehicle crash rates in jurisdictions that have implemented the HVNL were compared with crash rates for these two control groups by examining trends over time in charts and through statistical techniques.

Statistical methodology

An analytical technique called difference-in-differences was used to estimate the effect of the HVNL on heavy vehicle safety outcomes (box B.1). This approach was appropriate due to the existence of control groups and data on pre-reform safety outcomes.

Box B.1 **The difference-in-differences method**

Difference-in-differences is a statistical technique that makes use of longitudinal data to estimate the effect of a specific intervention or treatment (such as a passage of law or enactment of policy). The technique compares changes in the variable of interest among a population that is subject to the treatment (the treated group) and a population that is not (the control group) (Angrist and Pischke 2009). This technique has been used to examine a range of policy issues — such as the relationship between minimum wages and employment (Card and Krueger 1994), trade liberalisation and per capita income (Slaughter 2001) and medical marijuana laws and traffic fatalities (Anderson, Hansen and Rees 2013).

In order to estimate a causal effect using a difference-in-differences method, several assumptions must be satisfied. Most notably, this approach requires that in the absence of the treatment, the difference between the ‘treated’ and ‘control’ group is constant over time (common trend assumption). However, additional control variables can be added to the specification to account for time-varying factors that might affect the difference between the two groups over time. Other assumptions are that the treatment is unrelated to outcomes before the treatment, and that the composition of treated and control groups is stable over time.

This statistical technique was used to compare changes in heavy vehicle crash rates in HVNL jurisdictions and the two control groups before and after the national reforms. Two models were estimated.

First, a difference-in-differences estimation was performed comparing heavy vehicle crash rates in HVNL and non-HVNL jurisdictions (model 1). Using the same model, additional estimations were performed on different types of crashes (such as crashes that involved articulated heavy vehicles only).

Second, a model was estimated by comparing heavy and non-heavy vehicle crash rates in HVNL jurisdictions (model 2).

Including jurisdiction-level fixed effects in the models controls for time-invariant differences between jurisdictions that affect crash rates. For example, in the case of model 1, this approach controls for differences in geography and road geometry (such as the remoteness of the landscape and degree of curvature on major freight routes) between HVNL and non-HVNL jurisdictions. The approach also includes time fixed effects. This controls for trends in factors that affect crash rates that are common to all jurisdictions, such as the increasing prevalence of mobile phone usage while driving, or improvements in road safety technology.

Heavy vehicle crashes in HVNL and non-HVNL jurisdictions

Model specification

The following difference-in-differences model for jurisdiction i , in year-quarter t was estimated using ordinary least squares, where $Crash\ rate_{it}$ is the number of heavy vehicle crashes per billion heavy vehicle kilometres travelled.

$$Crash\ rate_{it} = \beta_0 + \gamma_i + \lambda_t + \beta_1 D_{it} + \beta_s state_{it} + \beta' X_{it} + \varepsilon_{it}$$

Descriptions of the variables and parameters used are detailed in table B.2.

Three empirical specifications were used:

- specification 1 — baseline specification, which includes time fixed effects and jurisdiction fixed effects
- specification 2 — baseline specification with the addition of jurisdiction-specific linear time trends
- specification 3 — baseline specification with the addition of jurisdiction-specific linear time trends and control variables.

Specification 3 is preferred because it includes the most control variables for factors that could affect crash rates, allowing it to better isolate the effect of the HVNL.

Table B.2 Model 1 variables and parameters

Variable/ parameter	Variable or parameter descriptions	Included in specification:		
		(1)	(2)	(3)
β_0	Intercept	✓	✓	✓
γ_i	Jurisdiction fixed effects	✓	✓	✓
λ_t	Time (year-quarter) fixed effects	✓	✓	✓
D_{it}	Dummy variable indicating 1 for when the HVNL applies for HVNL jurisdictions	✓	✓	✓
β_1	Effect of the HVNL (treatment effect)	✓	✓	✓
$state_{it}$	Jurisdiction-specific linear time trends ^a		✓	✓
β_s	Vector of coefficients corresponding to each respective jurisdiction-year-quarter interaction		✓	✓
X_{it}	Vector of control variables to account for changes in jurisdiction-level vehicle kilometres travelled (of both heavy and non-heavy vehicles) and jurisdiction populations over time			✓
β'	Vector of coefficients corresponding to each respective control variable			✓

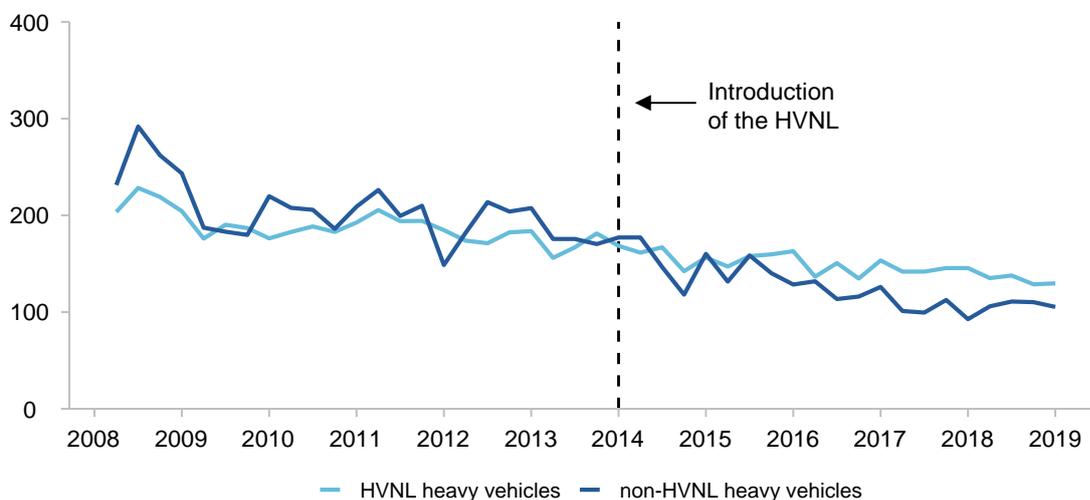
^a Jurisdiction-specific linear time trends are incorporated through an interaction term between jurisdiction indicator variables and a variable indicating the period of time since 2008 (the first data point in the NCD). This controls for unobserved factors (such as attitudes towards road safety and road management) that trend smoothly in each jurisdiction.

Pre- and post-reform trends

Pre- and post-reform trends in crash rates for heavy vehicles in HVNL and non-HVNL jurisdictions are depicted in figure B.1. Crash rates are expressed per billion vehicle kilometres travelled to account for the different levels of activity across jurisdictions. In examining whether the common trend assumption (box B.1) was satisfied, a slightly steeper downward trend was observed in crash rates in non-HVNL jurisdictions compared with HVNL jurisdictions in both the pre- and post-reform periods.²⁰ Differences in trends were accounted for via the inclusion of jurisdiction-specific linear time trends (included in specifications 2 and 3 of the difference-in-differences model). There did not appear to be a significant deviation from the pre-reform trends in either HVNL or non-HVNL jurisdictions in the post-reform period. This observation does not suggest that the HVNL has had an impact one way or the other on heavy vehicle safety. The following section examines whether there is evidence supporting the role of the national reforms in explaining the observed improvement in safety outcomes after controlling for a variety of factors (as outlined above).

Figure B.1 Pre- and post-reform trends in heavy vehicle crash rates in HVNL and non-HVNL jurisdictions^{a,b}

Heavy vehicle crashes involving injury or death per billion heavy vehicle kilometres travelled



^a The Commission is aware that a quality assurance process is underway for WA crash statistics before 2012. ^b The HVNL commenced on 10 February 2014 in all jurisdictions except for Western Australia and the Northern Territory.

Source: Commission estimates based on National Crash Database (BITRE, unpublished).

²⁰ The other two difference-in-differences assumptions discussed in box B.1 appear to be satisfied.

Regression results

The results for model 1 are presented in table B.3. If the HVNL had improved heavy vehicle safety, the treatment effect would be expected to be significant and negative (reducing the crash rate). Results from the baseline specification (specification 1) suggest that the HVNL might have had a negative effect on safety. However, the coefficient is not statistically significant in specification 2, suggesting that factors within jurisdictions that have a linear effect on heavy or non-heavy vehicle crash rates over time (such as jurisdiction-specific education campaigns) were important in explaining changes in crash rates. Results from the preferred specification (specification 3) show there is insufficient evidence to suggest that the HVNL had a significant impact on heavy vehicle safety.²¹

Table B.3 Heavy vehicle crashes in HVNL and non-HVNL jurisdictions^a
Difference-in-differences results

	<i>Specification 1</i> <i>Baseline with fixed effects</i>	<i>Specification 2</i> <i>Baseline with fixed effects</i> <i>and jurisdiction-specific</i> <i>time trends</i>	<i>Specification 3</i> <i>Baseline with fixed effects,</i> <i>jurisdiction-specific time</i> <i>trends and control</i> <i>variables</i>
Effect of HVNL	23.80*	20.13	22.91
Standard error	(12.44)	(25.44)	(25.77)
R-squared	0.42	0.51	0.52
Observations	352	352	352

^a Results using quarterly data from January 2008 to December 2018. The HVNL was assumed to apply for relevant jurisdictions from the first quarter of 2014. The dependent variable is the number of heavy vehicle crashes (involving injury or death) per billion heavy vehicle kilometres. Standard errors have been corrected for clustering at the jurisdiction level. * p<0.10, ** p<0.05, *** p<0.01.

Source: Commission estimates based on National Crash Database (BITRE, unpublished).

A caveat to this finding is that there have been regulatory changes in Western Australia and the Northern Territory, which may have affected heavy vehicle safety outcomes. These include the introduction of Chain of Responsibility laws and changes to heavy vehicle compliance requirements (Main Roads Western Australia 2015). Adopting the HVNL and parallel regulatory changes in non-HVNL jurisdictions may have had similar effects on heavy vehicle safety. As such, the analysis did not identify a ‘pure’ treatment effect of the HVNL. It also reflected other differences between HVNL and non-HVNL jurisdictions that occurred during the HVNL period. Analysis using model 2 below examined differences between heavy and non-heavy vehicles in HVNL jurisdictions only.

²¹ In specification 3, jurisdictions that signed up to the HVNL are associated with 22.91 additional quarterly heavy vehicle crashes per billion kilometres travelled in the post-reform period on average. However, this result is not statistically significant.

Robustness checks

To examine whether the results in model 1 were robust across different types of crashes, the Commission analysed:

- crashes separately for articulated and heavy rigid trucks²²
- crashes involving fatalities only.

Crashes involving a fatigued heavy vehicle driver could not be rigorously examined because this variable was inconsistently reported across jurisdictions in the NCD.

Tables B.4 and B.5 present results for models comparing crash rates in HVNL and non-HVNL jurisdictions separately for articulated and heavy rigid vehicles. Table B.6 presents results for the model comparing fatal heavy vehicle crash rates in HVNL and non-HVNL jurisdictions. Analysis in table B.6 was conducted using yearly data to account for the low occurrence of fatal crashes in some jurisdictions, which led to substantial variation in crash rates from one quarter to the next.²³

Again, results from the preferred specification (specification 3) in all three models show there is insufficient evidence to suggest that the HVNL had a significant impact on heavy vehicle safety.

²² ‘Heavy rigid’ refers to motor vehicles greater than 4.5 tonnes Gross Vehicle Mass constructed with a load carrying area or fitted with special purpose equipment. ‘Articulated’ refers to motor vehicles constructed primarily for load carrying, consisting of a prime mover that has no significant load carrying area but with a turntable device linked to one or more trailers.

²³ The number of fatalities at the year-quarter level was highly variable due to the small counts of fatalities (there were a number of jurisdictions for which no fatal crashes involving a heavy vehicle driver occurred in a given year-quarter). This made results very sensitive to small changes in the analysis (such as removing the first two quarters of data, or adjusting the treatment period by one quarter), making it difficult to draw robust conclusions.

Table B.4 Articulated vehicle crashes in HVNL and non-HVNL jurisdictions^a

Difference-in-differences results

	<i>Specification 1</i> <i>Baseline with fixed effects</i>	<i>Specification 2</i> <i>Baseline with fixed effects and jurisdiction-specific time trends</i>	<i>Specification 3</i> <i>Baseline with fixed effects, jurisdiction-specific time trends and control variables</i>
Effect of HVNL	-18.06	4.08	8.15
Standard error	(18.45)	(30.72)	(31.22)
R-squared	0.26	0.28	0.28
Observations	352	352	352

^a Results using quarterly data from January 2008 to December 2018. The HVNL was assumed to apply for relevant jurisdictions from the first quarter of 2014. The dependent variable is the number of articulated vehicle crashes (involving injury or death) per billion articulated vehicle kilometres. Standard errors have been corrected for clustering at the jurisdiction level. * p<0.10, ** p<0.05, *** p<0.01.

Source: Commission estimates based on National Crash Database (BITRE, unpublished).

Table B.5 Heavy rigid vehicle crashes in HVNL and non-HVNL jurisdictions^a

Difference-in-differences results

	<i>Specification 1</i> <i>Baseline with fixed effects</i>	<i>Specification 2</i> <i>Baseline with fixed effects and jurisdiction-specific time trends</i>	<i>Specification 3</i> <i>Baseline with fixed effects, jurisdiction-specific time trends and control variables</i>
Effect of HVNL	62.30***	42.90	44.63
Standard error	(16.43)	(32.11)	(32.36)
R-squared	0.45	0.59	0.59
Observations	352	352	352

^a Results using quarterly data from January 2008 to December 2018. The HVNL was assumed to apply for relevant jurisdictions from the first quarter of 2014. The dependent variable is the number of heavy rigid vehicle crashes (involving injury or death) per billion heavy rigid vehicle kilometres. Standard errors have been corrected for clustering at the jurisdiction level. * p<0.10, ** p<0.05, ***p <0.01.

Source: Commission estimates based on National Crash Database (BITRE, unpublished).

Table B.6 Fatal heavy vehicle crashes in HVNL and non-HVNL jurisdictions^a

Difference-in-differences results

	<i>Specification 1</i> <i>Baseline with fixed effects</i>	<i>Specification 2</i> <i>Baseline with fixed effects and jurisdiction-specific time trends</i>	<i>Specification 3</i> <i>Baseline with fixed effects, jurisdiction-specific time trends and control variables</i>
Effect of HVNL	6.26*	9.45*	9.87
Standard error	(3.35)	(5.70)	(5.93)
R-squared	0.35	0.40	0.40
Observations	88	88	88

^a Results using yearly data from 2008 to 2018. The effect of the HVNL was measured from 2014 onwards. The dependent variable is the number of fatal heavy vehicle crashes (involving injury or death) per billion heavy vehicle kilometres. Standard errors have been corrected for clustering at the jurisdiction level. * p<0.10, ** p<0.05, *** p<0.01.

Source: Commission estimates based on National Crash Database (BITRE, unpublished).

Heavy and non-heavy vehicle crashes in HVNL jurisdictions

As noted above, analysis in model 1 did not identify a pure treatment effect due to regulatory changes in non-HVNL jurisdictions that occurred in the post-reform period. Comparisons were drawn between heavy and non-heavy vehicles in HVNL jurisdictions to check the robustness of the above analysis of the impact of the HVNL on heavy vehicle safety.

Model specification

The following difference-in-differences model for jurisdiction i , by vehicle type j , in year-quarter t was estimated, where $Crash\ rate_{ijt}$ is the number of crashes per billion vehicle kilometres travelled for the respective vehicle type (heavy or non-heavy).

$$Crash\ rate_{ijt} = \beta_0 + vehicle_j + \gamma_i + \lambda_t + \beta_1 D_{it} + \beta_s state_i * vehicle_j * t + \beta' X_{it} + \varepsilon_{it}$$

Descriptions of the variables and parameters used in model 2 are detailed in table B.7. As in model 1, three specifications were conducted, with specification 3 being the preferred model.

Table B.7 Model 2 variables and parameters

Variable/parameter	Variable or parameter descriptions	Included in specification:		
		(1)	(2)	(3)
β_0	Intercept	✓	✓	✓
$vehicle_j$	Dummy variable indicating 1 for heavy vehicles and 0 for non-heavy vehicles	✓	✓	✓
γ_i	Jurisdiction fixed effects for each vehicle type (heavy/non-heavy)	✓	✓	✓
λ_t	Time (year-quarter) fixed effects	✓	✓	✓
D_{it}	Dummy variable indicating 1 for heavy vehicles in the post-reform time period	✓	✓	✓
β_1	Effect of the HVNL (treatment effect)	✓	✓	✓
$state_i * vehicle * t$	Jurisdiction, vehicle-specific linear time trends ^a		✓	✓
β_s	Vector of coefficients corresponding to each respective jurisdiction-vehicle specific, year-quarter interaction		✓	✓
X_{it}	Vector of control variables to account for changes in jurisdiction-level vehicle kilometres travelled (of both heavy and non-heavy vehicles) and jurisdiction populations over time			✓
β'	Vector of coefficients corresponding to each respective control variable			✓

^a Jurisdiction, vehicle-specific linear time trends are incorporated through an interaction term between jurisdiction indicator variables, the vehicle type indicator variable, and a variable indicating the length of time since 2008 (the first data point in the NCD). This controls for unobserved factors (such as attitudes towards road safety and road management) that trend smoothly in each jurisdiction by vehicle type.

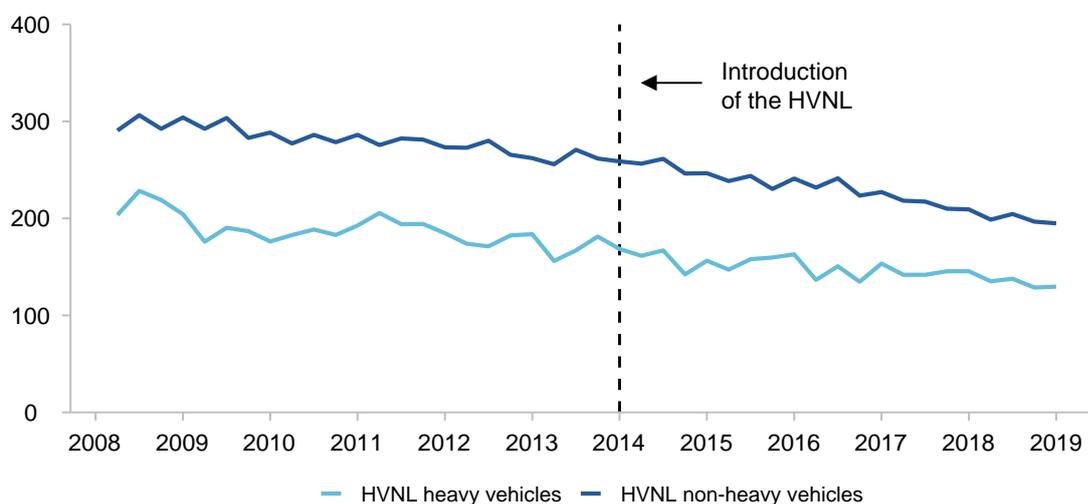
Pre- and post-reform trends

Pre- and post-reform trends in crash rates for heavy and non-heavy vehicles in HVNL jurisdictions are depicted in figure B.2. Crash rates are expressed as per billion kilometres travelled, for each respective vehicle type, to account for the different levels of activity across jurisdictions. Trends in the pre-reform period provide evidence of a common trend (figure B.2).²⁴ There did not appear to be a substantial deviation from the common trend in the post-reform period, which again presents little evidence to support that the HVNL had an impact one way or the other on heavy vehicle safety.

²⁴ The other two difference-in-differences assumptions discussed in box B.1 also appear to be satisfied.

Figure B.2 Pre- and post-reform trends in heavy and non-heavy vehicle crash rates in HVNL jurisdictions^{a,b}

Crashes involving injury or death per billion vehicle kilometres travelled



^a Non-heavy vehicles include all vehicles other than articulated and heavy rigid trucks. ^b The HVNL commenced on 10 February 2014 in all jurisdictions except for Western Australia and the Northern Territory.
 Source: Commission estimates based on National Crash Database (BITRE, unpublished).

Regression results

The results for model 2 are presented in table B.8. Consistent with model 1, results from the preferred specification (specification 3) show that there is insufficient evidence to suggest that the HVNL had a statistically significant impact on heavy vehicle safety.²⁵

A caveat to this finding is that after the HVNL was enacted there may have been improvements in vehicle design of safety features that have asymmetrically benefitted heavy and non-heavy vehicles. Moreover, the estimates may be biased if other factors that affect crash rates (such as road safety enforcement campaigns) have been increasingly and effectively targeted at heavy or non-heavy vehicle drivers in the post-reform period.

²⁵ In the preferred specification (specification 3), jurisdictions that signed up to the HVNL are associated with 2.82 additional quarterly heavy vehicle crashes per billion kilometres travelled in the post-reform period on average. However, this result is not statistically significant.

Table B.8 Heavy and non-heavy vehicle crashes in HVNL jurisdictions^a
Difference-in-differences results

	<i>Specification 1</i> <i>Baseline with fixed effects</i>	<i>Specification 2</i> <i>Baseline with fixed effects and jurisdiction-specific, vehicle-specific time trends</i>	<i>Specification 3</i> <i>Baseline with fixed effects, jurisdiction-specific, vehicle-specific time trends and control variables</i>
Effect of HVNL	8.11	2.83	2.82
Standard error	(7.73)	(13.09)	(12.98)
R-squared	0.73	0.79	0.79
Observations	528	528	528

^a Results using quarterly data from January 2008 to December 2018. The HVNL was assumed to apply for relevant jurisdictions from the first quarter of 2014. The dependent variable is the number of crashes (involving injury or death) per billion kilometres for the respective vehicle type. Standard errors have been corrected for clustering at the jurisdiction level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Source: Commission estimates based on National Crash Database (BITRE, unpublished).

Summing up

Overall, these results suggest that there is insufficient evidence to associate the improvements in heavy vehicle crash rates in the post-reform period to the HVNL. Rather, it appears that the improvement was due to other factors, which could include better vehicle designs and safety features. While there are limitations associated with the use of each model, the fact that a similar conclusion was reached when using two alternative control groups, and when examining different crash types, supports this finding.

B.3 Heavy vehicle productivity framework and data

The introduction of the HVNL and NHVR were expected to improve productivity by promoting consistent and transparent decision making relating to heavy vehicle mass limits and road network access (Chow, Kleyer and McLeod 2019, p. 13; CIE 2011, p. 14). This was expected to encourage the use of larger vehicles and reduce the costs of undertaking the freight task.

Heavy vehicle operators are allowed to carry loads above general mass limits (GML) through the mass management module of the National Heavy Vehicle Accreditation Scheme (NHVAS) (which provides for Concessional Mass Limits (CML) and Higher Mass Limits (HML)) and larger vehicle designs through the Performance-Based Standards (PBS) scheme (chapter 7). While these schemes existed before the national reforms, greater consistency in administration by the NHVR, as well as improved access, was expected to promote uptake.

State, Territory and local governments hold ultimate responsibility for heavy vehicle access, but the NHVR has helped facilitate:

- access permit applications and assessments
- the pre-approval of permit routes
- gazetting of road networks through notices (chapter 7).

The reforms were also expected to improve productivity through reduced compliance and administration costs. These are discussed separately in chapter 7.

Conceptual framework

Different productivity measures can be useful for different analytical purposes. One common measure of productivity is the ratio of outputs to inputs. It captures how efficiently inputs (such as labour and capital) are used to produce a given volume of output. However, this concept is not particularly useful in assessing the productivity agenda for reform in the national heavy vehicle sector. Cost efficiency, the ratio of costs to output, is a more appropriate measure as it can summarise overall productivity when there are many inputs and factors to consider.

A measure of heavy vehicle productivity is the cost efficiency of freight movements — that is, how cost efficiently a given amount and composition of freight can be delivered (box B.2). The main costs considered in box B.2 are:

- operating costs for heavy vehicle operators (including the cost of fuel, tyres, repairs, maintenance and depreciation (ATAPGSC 2016, p. 7))
- infrastructure costs that road managers face (including maintenance and investment in roads, bridges and other road infrastructure).

A cost efficiency measure can accommodate the effects of improvements in heavy vehicle access. Access improvements would reduce kilometres travelled and travel time. This improvement would be expected to reduce unit costs on a cost efficiency measure. This framework also recognises that decisions to allow a particular type of vehicle to access a road should consider the costs (including increased infrastructure costs) and the benefits (including lower operating costs for heavy vehicle operators).

This cost efficiency framework can be extended to include other types of costs such as accident costs and environmental externalities. It can also be applied to other transport modes. The framework can be further extended by considering the impact of the costs of freight transport services on other industries and to the quantity of freight demanded. This extension would enable analysis of economy-wide effects, such as analyses through computable general equilibrium models (box B.3).

Box B.2 Road transport cost efficiency and productivity

Improving heavy vehicle productivity across the road transport network can be conceived of as the minimisation of the cost of providing transport services. A simplification is to assume that the volume of freight to be transported between origins and destinations is given.

Total costs associated with freight movements can be expressed in terms of the cost of the tonne kilometres, which is the sum of the tonnes (t) carried by each vehicle movement (i) of each vehicle type (j) on each route (k), multiplied by the length (km) of those routes. Suppose each vehicle type has an operating cost per tonne kilometre for the vehicle operator (c_j^o), and that each incurs infrastructure costs to the road manager depending on the route (c_{jk}^l). The minimisation problem for the total cost of freight movements (C) is given below.

$$\begin{aligned} \min C &= \sum_i \sum_j \sum_k (c_j^o t_{ijk} km_k + c_{jk}^l) = \sum_j \sum_k \left(c_j^o \frac{\sum_i t_{ijk}}{n_{jk}} n_{jk} km_k + c_{jk}^l \right) \\ &= \sum_j \sum_k (c_j^o \bar{t}_{jk} n_{jk} km_k + c_{jk}^l), \quad \text{s. t. } \sum_j \bar{t}_{jk} n_{jk} \geq \bar{Q}_{Dk} \quad \forall k \end{aligned}$$

- n_{jk} is the number of vehicle movements of type j on route k
- \bar{t}_{jk} is the average load of vehicles of type j on route k
- \bar{Q}_{Dk} is the given quantity of freight demanded on route k .

A summary measure of cost efficiency is the average cost per tonne. A reduction in average cost per tonne reflects a productivity improvement, all else equal. The average cost per tonne kilometre provides a different insight and is a partial measure of productivity because improved vehicle access would reduce both the numerator (costs) and denominator (tonne kilometres).

Example 1: Cost efficiency through access for larger vehicles

Consider a situation where 1000 tonnes of freight must be delivered from origin A to destination B, with only one route between these locations. There are two vehicle types, with 'standard' vehicles able to carry 10 tonnes of freight per trip, and 'large' vehicles able to carry 20 tonnes of freight per trip. Both vehicle types have the same operating cost per kilometre (so large vehicles have half the cost per tonne kilometre), and the same infrastructure costs on the route.

In this example shown below, large vehicles can deliver the freight in fewer vehicle movements and at a lower total cost than standard vehicles. Therefore, allowing large vehicles to access the route would promote cost efficiency.

Vehicle type (j)	Average load (\bar{t}_j)	Operating cost per tonne km (c_j^o)	Infrastructure cost (c_{jk}^l)	Route length (km)	Vehicle movements (n_j) to deliver 1000 tonnes	Total cost ($c_j^o \bar{t}_j n_j km + c_{jk}^l$)	Total cost per tonne
Standard	10	1.0	100	1	100	1 100	1.10
Large	20	0.5	100	1	50	600	0.60

(continued next page)

Box B.2 (continued)

Example 2: Effects of road infrastructure costs

Suppose now that allowing the large vehicle to travel on the route would require double the infrastructure cost relative to standard vehicles, for example due to reinforced infrastructure to prevent pavement damage or road widening requirements to safely facilitate access. In the example below, large vehicles can still deliver the freight in fewer vehicle movements and at a lower total cost than standard vehicles. Allowing large vehicles to access the route would still promote cost efficiency, but the cost savings relative to only allowing standard vehicles are smaller than in the first example.

Vehicle type (j)	Average load (\bar{t}_j)	Operating cost per tonne km (c_j^o)	Infrastructure cost (c_j^I)	Route length (km)	Vehicle movements (n_j) to deliver 1000 tonnes	Total cost ($c_j^o \bar{t}_j n_j \text{ km} + c_j^I$)	Total cost per tonne
Standard	10	1.0	100	1	100	1 100	1.10
Large	20	0.5	200	1	50	700	0.70

Box B.3 Measuring economy-wide impacts

Three tools to examine economy-wide impacts are: input-output tables; input-output modelling; and computable general equilibrium (CGE) modelling. Input-output tables are a point in time representation of the interdependencies (input-output flows) between different sectors in an economy. Input-output tables provide the underlying data used for input-output and CGE models. These models can be used to estimate the impact of a change to the economy, and assess the distributional effects of change across industries included in the input-output tables.

Input-output models rely on the assumptions that prices stay the same and the supply of resources (capital and labour) is limitless. Given these assumptions, input-output models are often only used when looking at open regional economies, or to evaluate ‘relatively small changes in the economy’, such that it can be assumed that ‘all other things remain equal’.

CGE models overcome these shortcomings as they do not assume that there is an unlimited supply of resources available at fixed prices. Some assumptions of standard CGE models are that: material and capital inputs to production are not substitutable; all industries have constant returns to scale; and workforce participation is a fixed share of the working age population, and employment is a fixed share of workforce participants.

Source: Gretton (2013, pp. 10, 13).

Although this framework examines cost efficiency from the perspective of a whole road network, often infrastructure managers make decisions about specific road transport projects. Cost–benefit analysis guidelines for infrastructure managers consider similar factors (such as vehicle operating costs and infrastructure costs) in making these decisions (box B.4).

Box B.4 Cost–benefit analysis in transport projects

Cost–benefit analysis is used to assess future projects and the strengths and weaknesses of project options. It aims to summarise the combined costs and benefits to all members of society from a project in a single number.

Costs and benefits that are evaluated in road transport projects include:

- vehicle operating costs (such as fuel, tyres, vehicle repairs and maintenance)
- travel time costs (measured for example by average trip time, value of freight per hour)
- capital costs (such as design and construction, pavement, project management)
- infrastructure operating costs (such as maintenance and administration)
- accident costs (such as fatalities, injuries and property damage resulting from crashes)
- environmental externalities (such as noise and pollution).

Network and cross-modal effects may also be important. For example, improving road links could benefit the operation of a larger road network, and could affect demand for rail transport. Cost–benefit analysis can be accompanied by transport modelling to examine these effects.

There are further factors to consider for cost–benefit analysis involving heavy freight vehicles (for example, road widening projects and highway upgrades could allow for larger freight vehicles). Freight efficiency benefits include the reductions in vehicle movements and driving and loading costs for a given volume of freight moved. These are measured by changing the vehicle composition between the base case and the project case for each heavy vehicle type. Secondary infrastructure works such as heavy vehicle rest areas should also be considered.

Sources: ATAPSC (2018); QLD TMR (2011).

The Commission’s approach

Cost efficiency is complex to quantify. This is especially the case in a backward-looking analysis of the effect of past reforms, which involves using information about what has happened, rather than assumptions about what could be (as is the case in a forward-looking analysis of future reforms). These difficulties are described further in the following section.

Consequently, partial indicators of performance were used in chapter 7, drawing on the best available data. Trends and observations in these indicators have been tied to qualitative evidence to help explain findings. Broadly, these partial indicators fall under two categories.

The first category contains factors affected by the HVNL reforms that would have an impact on cost efficiency. This includes access arrangements and numbers of vehicles operating above general mass allowances. Analysing changes to these factors provides an indication of how the HVNL might have affected productivity by improving cost efficiency. However, data limitations restrict the extent to which the actual effect can be identified, and there could be non-HVNL influences that explain changes in these factors (described further below). Furthermore, the costs of infrastructure upgrades required to accommodate access for vehicles were not directly considered.

The second category contains partial indicators that capture the state of heavy vehicle activity, as well as road transport and transport sectors more broadly. BITRE took this approach in examining aggregate freight vehicle productivity, measured by indicators such as average vehicle freight load and average vehicle utilisation (kilometres travelled per vehicle) (BITRE 2011). It also examined tonne kilometres per vehicle, which encapsulates both of the former two indicators, as well as labour productivity and fuel efficiency. Even though some of these indicators capture elements of cost efficiency, it is difficult to determine whether changes are caused by the HVNL reforms due to other changes over time. Further, a positive reform outcome of increased heavy vehicle access could translate into lower ‘productivity’ on some of these indicators, such as average kilometres travelled and tonne kilometres per vehicle.

Difficulties quantifying and attributing productivity benefits to reforms

Quantifying the change in productivity

Detailed longitudinal data on different heavy vehicle types and access arrangements are needed to provide insights into changes in heavy vehicle productivity from a cost efficiency perspective. There are many types of vehicle combinations and these have different access arrangements (chapter 7). Schemes that affect mass allowances add further complexity to the types of vehicles available and their access arrangements.

Changes in access for different vehicle types on different roads, and changes in ease of uptake of the PBS scheme and NHVAS mass management module will have different impacts on heavy vehicle activity, cost efficiency and therefore productivity. Allowing a larger type of freight vehicle to access a key freight route is likely to have larger productivity benefits than allowing that type of vehicle on a small road that does not have much heavy vehicle traffic. Increased uptake in the PBS scheme for large freight vehicles is also likely to have larger benefits than for smaller vehicles.

Sufficiently detailed data to accurately quantify changes in heavy vehicle cost efficiency are unavailable (discussed below). Consequently, partial indicators of performance were used to examine changes in the productivity of freight-carrying heavy vehicles in chapter 7, but these also have limitations (discussed above).

There are also insufficient productivity measures for non-freight carrying heavy vehicles. As these vehicles do not contribute to the national freight task, their ‘value’ cannot be measured by, for example, tonnes moved and kilometres travelled (CIE 2011, pp. 37–38).

The lack of detailed data also limits the estimation of economy-wide impacts of heavy vehicle reform (box B.5). This would require data on how individual industries use specific heavy vehicles because changes in access and ease of uptake for particular vehicle types will have larger productivity impacts on industries relying more heavily on that vehicle type. For example, an increase in access for truck and dog vehicle combinations may benefit operators in the construction business, more than say, operators in the agricultural industry, who rely

more on larger vehicles such as B-doubles. These changes will have different flow-on effects, depending on the size of the impact on affected industries, and how important these industries are to other industries and the broader economy.

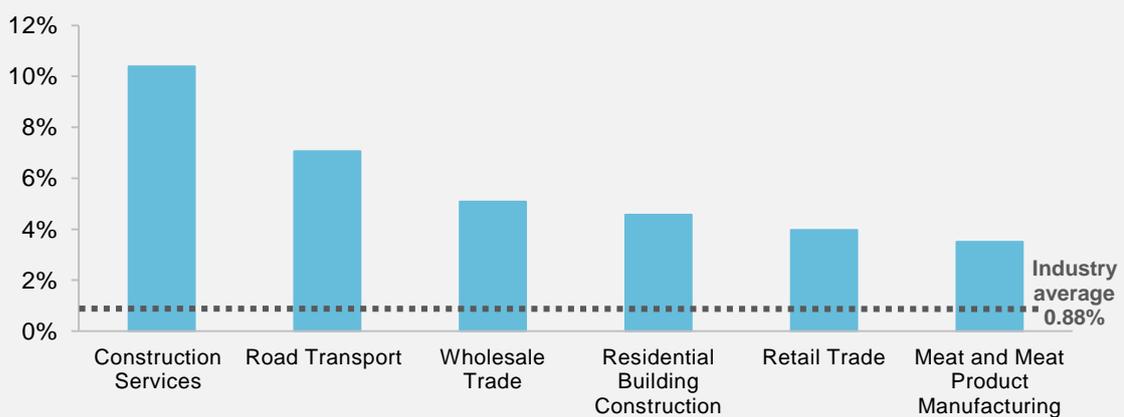
A consideration in quantifying the effects of changes to heavy vehicle access and ease of uptake is that it may affect the demand for other modes of freight transport and alter total transport productivity. For example, an increase in heavy vehicle access may decrease road freight costs. This may lead to an increase in the demand for road transport but a decrease in the demand for rail transport. Quantifying the change in total transport productivity would need to account for the effect on both the road and rail transport sectors.

Box B.5 Data to analyse economy-wide impacts of heavy vehicle reform

Data from ABS input-output tables show that operators in many industries use road transport. Major users include construction services, wholesale trade, and residential building construction, as shown in the figure below. Other industries, including various manufacturing industries, spend relatively less on road transport, but it represents a large share of their total costs.

More detailed input-output tables are needed to estimate the economy-wide impacts of heavy vehicle reforms. Although it is likely that heavy vehicles encompass a large share of road transport costs, road transport is a broad category that captures both passenger and freight transport. Only a subset of freight transport costs will involve heavy vehicles. Heavy vehicle reforms also do not affect all types of heavy vehicles equally. Data on heavy vehicle costs split into specific types of heavy vehicles, where the shares differ for each industry, are required to accurately assess how a change might affect the broader economy.

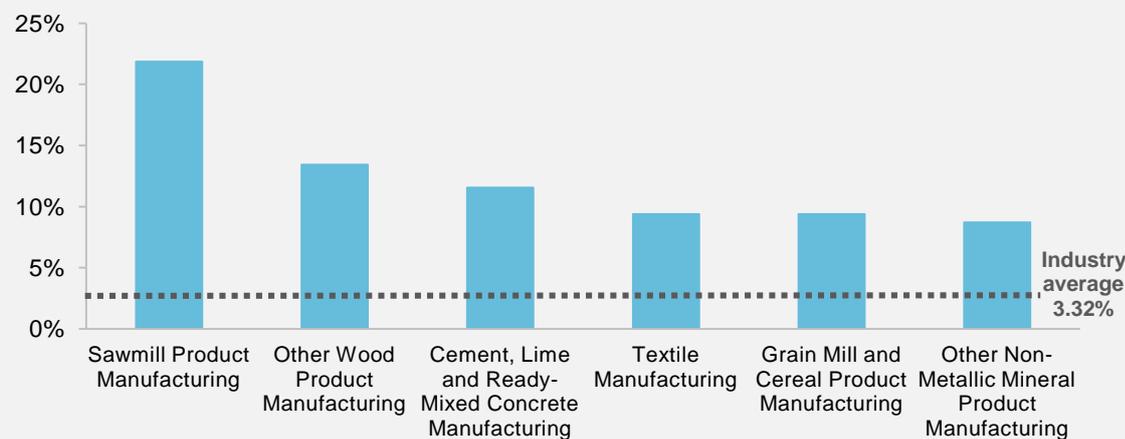
Top six users of road transport — industry expenditure on road transport as a share of expenditure on road transport services by all industries^a



(continued next page)

Box B.5 (continued)

Top six industries by road transport cost shares — cost of road transport to industry as a share of the respective industry's total costs^a



^a Domestic costs and expenditure, excluding taxes.

Source: Commission estimates based on ABS (*Australian National Accounts: Input-Output Tables, 2016–2017*, Cat. no. 5209.0.55.001).

Attributing changes in productivity to the national reforms

Even if the change in productivity could be accurately quantified, attributing the change to the national reforms is an additional challenge.

There are many factors unrelated to the HVNL and NHVR that impact heavy vehicle activity, uptake and productivity that are difficult to control for. These include increased demand for road freight transport due to economic factors (such as the construction boom) and changes in rail freight costs, and increased productivity due to technological change. Further, changes in vehicle access are primarily decided by infrastructure managers, and it is uncertain how much the HVNL and NHVR influence these decisions.

In addition, there is no neat division between the pre-reform and post-reform periods. Transition to the national system has taken place over several years and is still occurring. Many initiatives that are part of the national laws predate the reforms, for example, the PBS scheme, which was introduced in 2009.

Finally, some changes in access, uptake and heavy vehicle activity that may be due to the reforms are unlikely to be immediately observable. For example, there may be a lag in the uptake of larger heavy vehicles, as operators gradually renew their fleets over time.

Other studies on the effects of heavy vehicle reforms on productivity

Several studies have attempted to quantify the benefits of heavy vehicle reforms on productivity, often using a cost savings framework (table B.9). Many of these examine the forward-looking effects of future reforms, rather than conduct a backward-looking analysis of past reforms. The studies rely on various simplifying assumptions, and do not consider the full complexities of the system. For example, studies that estimate flow-on effects to other industries (using methods discussed in box B.3) typically do not consider how reforms affect specific types of heavy vehicles and hence specific industries. Rather, they assume that reforms affect all industries that use ‘road transport’ (or other broad transport categories) in the same way, resulting in large estimates of economy-wide benefits.

Data and data limitations

The Commission examined heavy vehicle productivity using public data from the ABS, BITRE and Department of Infrastructure, Transport, Regional Development and Communications (DITRDC), and unpublished administrative datasets from the NHVR and TCA (table B.10). Collectively these datasets offer detailed insights into heavy vehicle productivity. Each provides a different piece of the picture under the conceptual framework (box B.2). For example:

- ABS data provide some information on numbers of vehicles, average loads and kilometres travelled for broad vehicle types, but not the roads they are travelling on
- DITRDC data on key freight routes provide an indication of the roads accounting for the most tonne kilometres
- NHVR data provide information on vehicles operating at higher mass, as well as access arrangements on particular roads for specific heavy vehicle types (via permits, pre-approvals and gazetted routes), but have limited information on how many vehicle movements occur on those roads
- TCA data provide some information on the number of vehicle movements on particular roads by vehicle type.

Data from multiple sources were used to examine particular issues where possible. For instance, NHVR data on heavy vehicle gazetted network access were compared with DITRDC key freight routes, and numbers of vehicle movements on some expanded networks were examined using TCA data.

Some datasets suffer from quality issues (table B.10). For example, NHVR data are sourced from NHVR’s administrative and operational systems, and are not designed for quantitative analysis. TCA data on vehicle movements capture a limited number of vehicles that may not be representative of the whole heavy vehicle fleet. These issues have restricted the Commission’s analysis of the productivity impacts of the HVNL and NHVR

Table B.9 Summary of past research on effects of heavy vehicle reforms on productivity

<i>Study</i>	<i>Overview of method for estimating productivity</i>	<i>Heavy vehicle reform analysed (B = backward-looking, F = forward-looking)</i>	<i>Estimated benefits^a (\$b)</i>	<i>Study limitations</i>
NTC (2011), CIE (2011)	Using a top-down approach, the study took estimated costs and benefits of HVNL reforms calculated in previous studies, and then used additional information and assumptions to attribute the costs and benefits across specific reform areas.	HVNL reforms (F)	3.9–8.7 from 2011 to 2030	<ul style="list-style-type: none"> Assumes nationally consistent laws will be administered, which has not fully eventuated in practice. Estimates can be assumption driven. For example, total Restricted Access Vehicle (RAV) benefits assumed to be double PBS benefits from another study.
	Using a bottom-up approach, the study estimated: productivity improvements (such as reduced kilometres travelled) from substituting towards higher productivity vehicles; shares of vehicles and freight task affected; and uptake rates. These estimates were converted to labour, capital and variable input productivity improvements for the heavy vehicle sector, which were used as inputs to a computable general equilibrium model to calculate economy-wide benefits.	HVNL reforms — PBS (F)	0.55 a year	<ul style="list-style-type: none"> Assumes nationally consistent laws will be administered.
		HVNL reforms — non-PBS RAV (F)	2.1 a year	<ul style="list-style-type: none"> Estimates can be assumption driven. For example, uptake in RAV per cent kilometres travelled assumed to be ten times higher with than without a consistent decision-making framework.
		HVNL reforms — HML (F)	0.16 a year	<ul style="list-style-type: none"> Computable general equilibrium modelling assumes productivity improvements affect each industry that uses 'other transport', without considering differing effects from changes to specific vehicle types.
	Under the bottom-up approach, the study made assumptions about the productivity of oversize overmass (OSOM) vehicles (because they do not carry freight), which led to benefits similar in size to HML vehicles.	HVNL reforms — OSOM (F)	0.16 a year	
Hassall (2014)	The study used data from a survey of PBS operators to estimate productivity benefits (based on cost savings relating to vehicle kilometres travelled) associated with three different levels of PBS network access. Estimates were projected forward based on assumed growth rates and shares of PBS vehicles for specific vehicle types. The study estimated flow-on effects to other industries using input-output modelling, where input-output tables were modified to separate the heavy vehicle industry from 'other' road transport. The modified tables are based on estimated costs for heavy rigid, heavy articulated and other vehicles, by product group carried.	Hypothetical PBS access scenarios (F)	4.7–8.7 direct cost savings from 2011 to 2030; 5.6 flow-on effects from 2011 to 2030	<ul style="list-style-type: none"> Analysis limited to hypothetical scenarios for PBS vehicles.

(continued next page)

Table B.9 (continued)

<i>Study</i>	<i>Overview of method for estimating productivity</i>	<i>Heavy vehicle reform analysed (B = backward-looking, F = forward-looking)</i>	<i>Estimated benefits^a (\$b)</i>	<i>Study limitations</i>
Deloitte Access Economics (2019)	The study estimated the yearly percentage change in the capital productivity index of the 'transport, postal and warehousing' industry over four years after the NHVR was introduced, and compared this with: <ul style="list-style-type: none"> the hypothetical increase in 'road transport' productivity necessary to realise productivity benefits estimated in the regulation impact statement productivity for a benchmark group made up of wholesale trade, manufacturing and mining industries. 	HVNL reforms (B)	No reported values, but concluded the reforms did not put the industry on a better trajectory	<ul style="list-style-type: none"> Aggregate view of productivity changes in 'transport, postal and warehousing' industry does not make it possible to identify how much of the change is in the heavy vehicle industry, let alone attribute changes to reforms.
	The study's policy scenarios analysed effects of: <ul style="list-style-type: none"> increased heavy vehicle access, via rising share of B-doubles, transition of B-triples operating on B-double routes, and AB-triple and BAB-quad vehicles operating on road train routes increased freight loads through more vehicles operating at HML. The study estimated effects of proposed policies on vehicle operating costs, based on net tonne kilometres, changes in vehicle class shares, and average loads. The study calculated flow-on effects to other industries using input-output modelling.	Study's proposed reforms (F)	13.6 direct cost savings from 2020 to 2050; 0.9 flow-on effects from 2020 to 2050	<ul style="list-style-type: none"> Proposed policy scenario of increased access abstracts from complexities of opening access in reality, including infrastructure considerations. Input-output modelling assumes productivity benefits affect each industry using 'road transport', without considering differing effects from changes to specific vehicle types.
Chow, Kleyer and McLeod (2019)	The study summed estimated benefits (cost savings) from: <ul style="list-style-type: none"> increasing uptake of PBS vehicles increasing uptake of NHVAS mass management module facilitating use of non-PBS RAVs. Estimated benefits to date were derived from trends in actual numbers of vehicles under PBS and NHVAS mass management module schemes, and assumed growth rates in the absence of reform. Future benefits were estimated according to assumed vehicle growth rates with and without the reform. Cost savings included vehicle operating costs, labour costs, road damage and externalities.	HVNL reforms (B, F)	4.5–9.3 from 2012 to 2033	<ul style="list-style-type: none"> Estimates can be assumption driven. For example, benefits of facilitating use of non-PBS RAVs assumed to be the same as benefits from increased PBS uptake. Benefits do not consider changes in vehicle access.

^a Includes freight productivity benefits only. Excludes other benefits, such as safety and environmental benefits, and compliance and administration cost savings.

Table B.10 Data used to examine heavy vehicle productivity

<i>Source</i>	<i>Dataset</i>	<i>Description and limitations</i>
Australian Bureau of Statistics (ABS)	Survey of Motor Vehicle Use (SMVU) (ABS 2019e)	<p>The SMVU has been conducted periodically from 1976 to 2018, and every 2 years since 2010. The SMVU includes samples of vehicles registered in Australia, and contains estimates relating to the fleet (for example, vehicle types, vehicle size and state of registration) and vehicle use (for example, tonnes carried, commodity carried and kilometres travelled).</p> <p>Some limitations of the SMVU are that:</p> <ul style="list-style-type: none"> • there is no information about whether vehicles are operating under schemes such as PBS, CML and HML • geographical information on vehicle movements is limited to broad area types (for example, capital city, intrastate, and other areas) • publicly available SMVU data do not allow for light rigid trucks and heavy rigid trucks to be separated under HVNL definitions.
	Motor Vehicle Census (MVC) (ABS 2019d)	<p>The MVC has been conducted periodically from 1971 to 2019, and every year since 2001. The MVC includes all vehicles registered in Australia, and provides more detailed information on the vehicle fleet than the SMVU (for example, light and heavy rigid trucks can be easily separated) but there is no information on vehicle use.</p> <p>Similar to the SMVU, there is no information about whether vehicles are operating under schemes such as PBS, CML and HML.</p>
	Road Freight Movements Survey (RFMS) (ABS 2015)	<p>The RFMS was conducted in 2014, and includes a sample of vehicles registered in Australia. The survey contains information about the movement of road freight. The RFMS provides more geographical information on vehicle movements relative to the SMVU (for example, vehicle movements by state of origin and destination, by vehicle type and commodity type).</p> <p>However, as the RFMS was a once-off survey, time comparisons are not possible. It also does not contain information about vehicles operating under schemes such as PBS, CML and HML.</p>
	Australian National Accounts (ABS 2019a)	<p>This publication contains quarterly estimates of gross domestic product and gross value added by industry since 1959. A limitation of these data is that narrower industry categories such as 'road freight transport' are not available (only 'road transport', which includes both freight and passenger road transport).</p>
	Estimates of Industry Multifactor Productivity (ABS 2019c)	<p>This publication contains labour, capital and multifactor productivity estimates for each industry division since 1985. Similar to National Accounts data, a limitation is that productivity estimates for narrower categories (such as 'road freight transport') are not available (only 'transport, postal and warehousing').</p>
Bureau of Infrastructure, Transport and Regional Economics	Freight rates in Australia (BITRE 2017)	<p>The information sheet presents estimates of annual freight rates for road, as well as rail, sea and air for 1965–2030. The road freight rates are an average for non-bulk commodities on interstate freight routes.</p>
Department of Infrastructure, Transport, Regional Development and Communications (DITRDC)	Key freight routes (DITRDC 2019)	<p>The DITRDC provided geospatial data underlying their published maps of key freight routes across Australia. These routes connect nationally significant freight locations and experience high heavy vehicle traffic, higher volumes of freight, or involve the transport of important commodities.</p>

(continued next page)

Table B.10 (continued)

<i>Source</i>	<i>Dataset</i>	<i>Description and limitations</i>
National Heavy Vehicle Regulator (NHVR) — unpublished data	Permit applications	<p>The NHVR provided de-identified permit application data from its operational systems from February 2014 to September 2019. The datasets include information on application type, application status, road manager, vehicle configuration and PBS status, and geospatial data on permit routes for applications under the new system.</p> <p>Several factors affect comparability of the data over time. First, States have gradually transferred responsibility for permits to the NHVR. Second, the NHVR introduced a new application system for all permits from October 2017 — data cannot easily be compared between old and new systems due to changes in how applications are submitted and updated.</p> <p>Further, there are inconsistencies that affect data quality. For example, the data do not include vehicle details for PBS vehicles, which can only be obtained by linking with the NHVR's PBS approvals data (discussed below) through manually reported PBS identification numbers where available.</p>
	Pre-approved permit routes and areas	<p>The NHVR provided data on pre-approved permit routes and areas, including information on road managers and vehicle types. However, there are data quality issues — for example, some pre-approved routes or areas have been gazetted but not yet updated in these data. Some geospatial data were also provided but these do not capture all pre-approved routes and areas.</p>
	Gazetted networks	<p>The NHVR provided geospatial datasets of gazetted networks for 2018 and 2019. These included gazetted routes and areas, as well as restrictions, by vehicle type and mass allowance. The NHVR also provided older records (in some cases back to 2014), but there are substantial differences in the quality of data across jurisdictions, vehicle types and over time.</p>
	PBS approvals	<p>The NHVR provided data on all PBS approvals from about 2014 to 2019, including information on vehicle combination type, PBS access level, and commodity carried. The data can be used to calculate the number of approved PBS combinations.</p>
	National Heavy Vehicle Accreditation Scheme (NHVAS)	<p>The NHVR provided data on the number of operators participating in each NHVAS module (including the mass management module, which is a requirement for CML and HML), by state, from 2015-16 to 2018-19. These data are consistent with data in the NHVR's published annual reports.</p>
	Registration data	<p>The NHVR provided registration data for 2018 and 2019. However, these data are limited because prime movers and trailers are registered separately, making it difficult to determine the composition of the fleet according to vehicle combinations (such as B-doubles).</p>
Transport Certification Australia (TCA) — unpublished data	Intelligent Access Program (IAP) data	<p>The TCA provided aggregated and de-identified data drawn from vehicle movements under the IAP in 2018-19. One dataset contained information on vehicle movements by road segment and vehicle type, and another contained information on journeys by vehicle type for different origins and destinations. The IAP is a requirement in only some states for vehicles operating at HML or PBS vehicles, and may be imposed as a condition of a permit. This means vehicles in the TCA data are a subset of all heavy vehicles so the data may not be fully representative of all movements.</p>

B.4 Analysis of heavy vehicle access

This section provides further details and charts relating to the descriptive analysis of heavy vehicle access discussed in chapter 7.

Permits

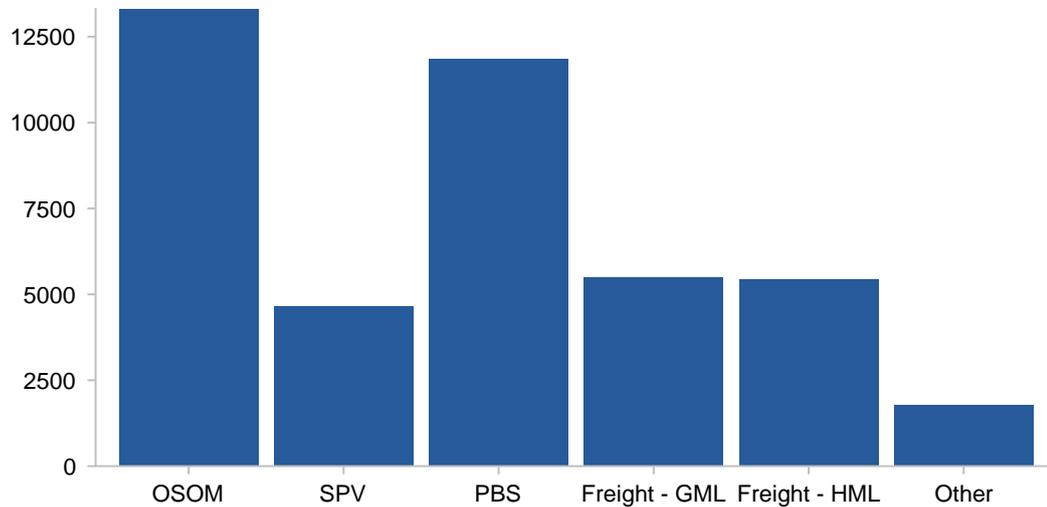
The analysis of NHVR permit data focused on completed applications. This includes applications for both single routes (which tend to be across state borders) and areas (which are defined by local government boundaries), that have been either approved or rejected. The data exclude most Class 1 permit applications in New South Wales and Queensland, which were still submitted directly to State road authorities rather than through the NHVR during the period of analysis (Deloitte Access Economics 2019, p. 26). Responsibility for processing these permits was gradually returned to the NHVR in 2019, with only Transport for New South Wales retaining some responsibility for processing Class 1 OSOM permits as of March 2020 (NHVR 2020).

Types of vehicles applying for permits

OSOM vehicles were the most common type among permit applications in 2018-19, even though most Class 1 OSOM permits in New South Wales and Queensland were excluded from the data. Transport for NSW stated that there were over 10 000 Class 1 and 3 OSOM access permits issued on its road network in the 12 months to October 2018 (TfNSW 2019, p. 3). OSOM vehicles constituted nearly one third of NHVR-completed permit applications (figure B.3), and covered a large network of roads across cities and regional Australia (figure B.4). Another 28 per cent of applications related to PBS vehicles, and about one quarter of applications were for non-PBS freight-carrying vehicles (such as B-doubles and road trains).

Figure B.3 OSOM permit applications are most common

Number of completed permit applications by vehicle type, 2018-19^a

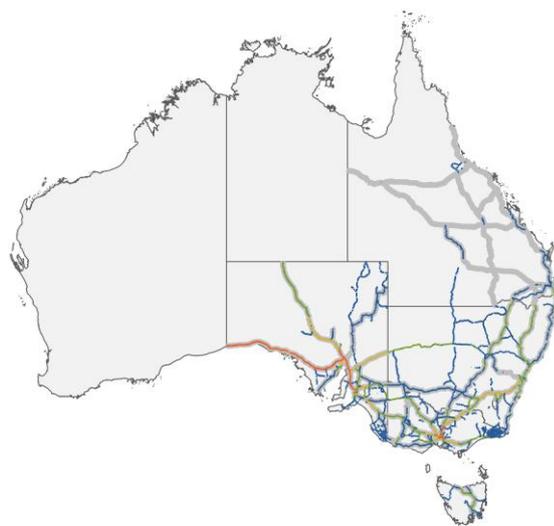


^a Excludes most Class 1 permit applications in New South Wales and Queensland, which were not submitted via the NHVR. 'Other' includes 'custom' vehicles (many of which were custom OSOM vehicles).

Source: Commission estimates based on data from NHVR (unpublished).

Figure B.4 OSOM permit applications cover a large network of roads

Number of OSOM permit applications by road segment, 2018-19^{a,b}



— Key freight route — 11–50 — 51–100 — 101–200 — >200

^a Excludes roads that had 10 or fewer permit applications in 2018-19. ^b Excludes most Class 1 permit applications in New South Wales and Queensland, which were not submitted via the NHVR.

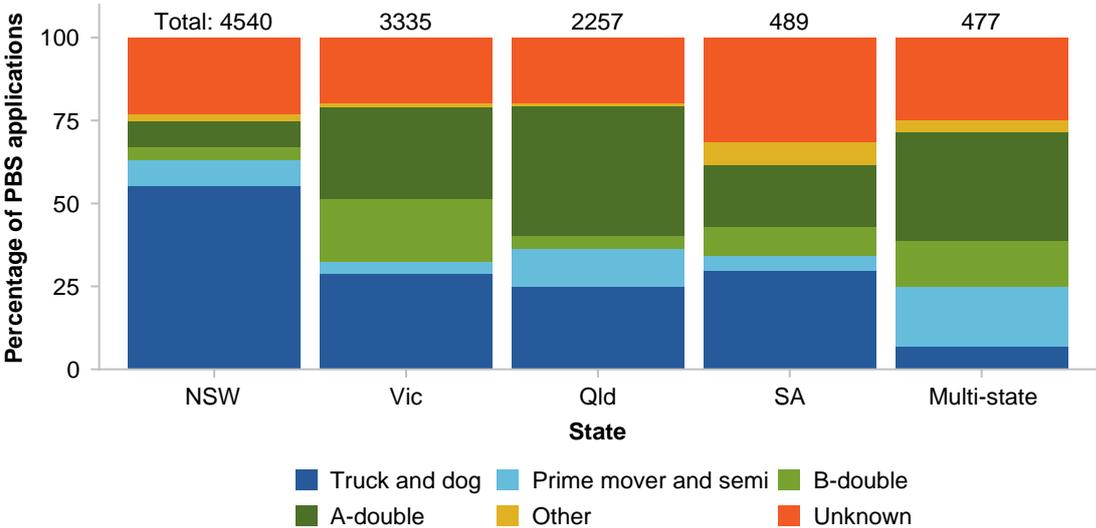
Sources: DITRDC (2019); Commission estimates based on data from NHVR (unpublished).

Where data on PBS vehicle types were available, nearly half of PBS permit applications were for truck and dog combinations applying for relatively small sections of road (Commission estimates based on data from NHVR (unpublished)). This may be an underestimate given PBS permits that are missing vehicle information are more likely to be for truck and dog combinations under notice (NHVR, pers. comm., 24 October 2019).

Further analysis shows differences in the types of PBS permits between states (figure B.5). Permit applications for PBS truck and dogs were most common in New South Wales, whereas applications for larger PBS freight vehicles (such as B-doubles and A-doubles) appeared to predominate in Victoria and Queensland.

Figure B.5 Types of PBS permit applications differ across jurisdictions

Completed permit applications by PBS combination type, as a percentage of all completed PBS permit applications, by state, 2018-19^a



^a This figure excludes Tasmania and the ACT, which only had 165 and 29 PBS permit applications respectively (excluding multi-state applications). It also excludes 560 PBS permit applications where the state could not be identified.

Source: Commission estimates based on data from NHVR (unpublished).

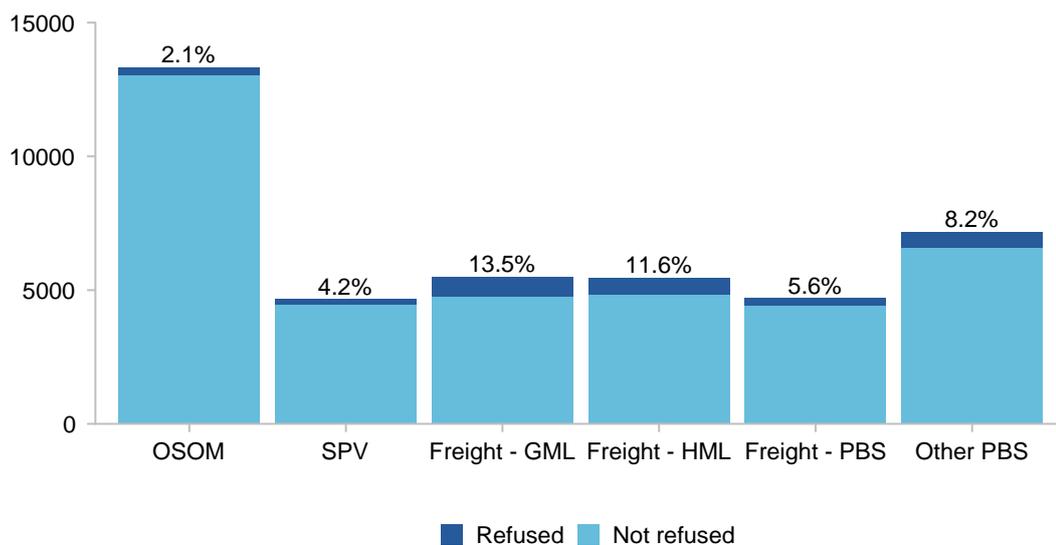
Refused permit applications

The proportion of applications refused among completed applications has fallen — from about 16 per cent in 2016-17 to about 6 per cent in 2018-19 (Commission estimates based on data from NHVR (unpublished)). Applications for OSOM vehicles were overwhelmingly approved, with a refusal rate of 2.1 per cent in 2018-19 (figure B.6). The vehicle types with relatively high rates of refusal include freight vehicles and their HML equivalents (at 12–14 per cent), although these vehicle types have relatively large as-of-right access networks.

Road managers most commonly stated road infrastructure as the reason for refusal (at 70 per cent). Public safety was the next most common reason (at 27 per cent), with this being predominantly due to the risk to road users. The remainder of refusals were due to public amenity reasons, including traffic congestion (Commission estimates based on data from NHVR (unpublished)).

Refusal rates for each road manager tended to reflect the types of applications they receive. However, some local governments had relatively high refusal rates — at up to 26 per cent among those that completed at least 100 applications in 2018-19. These road managers tended to refuse freight or PBS vehicle applications at a higher rate than other road managers. There could be location-specific reasons for this (for example, bridge capacity limitations), but some refusals could be due to inconsistent use of guidelines for granting access.

Figure B.6 OSOM permit applications are overwhelmingly approved
Number of completed permit applications, refusals by vehicle type, 2018-19^a



^a 'Other' vehicle types not shown. Excludes most Class 1 permit applications in New South Wales and Queensland, which were not submitted via the NHVR.

Source: Commission estimates based on data from NHVR (unpublished).

Permit processing times

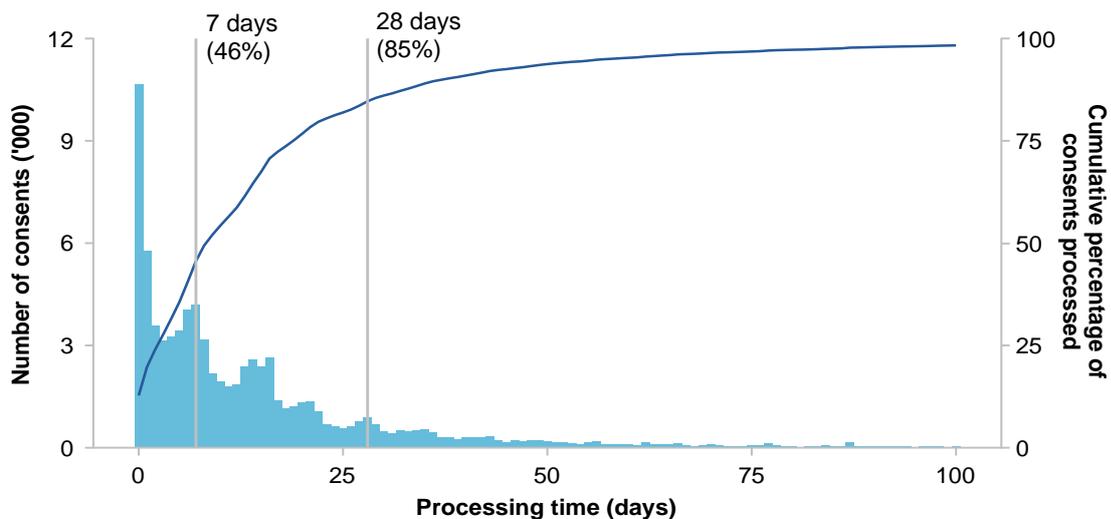
The HVNL requires road managers to advise of a permit decision within 28 days but there is no penalty for failing to respond within that timeframe. The current review of the HVNL is looking into reducing the timeframe or introducing a mechanism to deal with a lack of response (NTC 2019, p. 42). Other timeframes have been suggested as benchmarks or goals in previous reports. Analysis by the National Transport Commission defined 'consistently good' performance for a road manager as an average processing time of less than 7 days in each quarter within the year analysed (NTC 2019, p. 40). The Inquiry into National Freight

and Supply Chain Priorities suggested a 24-hour approval period for key freight routes (DIRDC 2018, p. 9).

Many road managers can process permits quicker than the 28-day timeframe. Permit application processing times have improved from an average of about 34 days to 19 days between 2016-17 and 2018-19 (NHVR 2019, p. 64). This included about 5 days of NHVR processing time on average. The Commission’s analysis shows that nearly half of permit decisions were made within 7 days in 2018-19, and 85 per cent within 28 days (figure B.7).

Permit processing times varied by vehicle type and road manager (figure B.8). OSOM and special purpose vehicle applications tended to be the quickest for road managers to assess (with a median time of 7 days in 2018-19), followed by PBS freight vehicles (8 days). Non-PBS freight vehicles and other freight vehicles took a median time of 13 days to assess (Commission estimates based on data from NHVR (unpublished)).

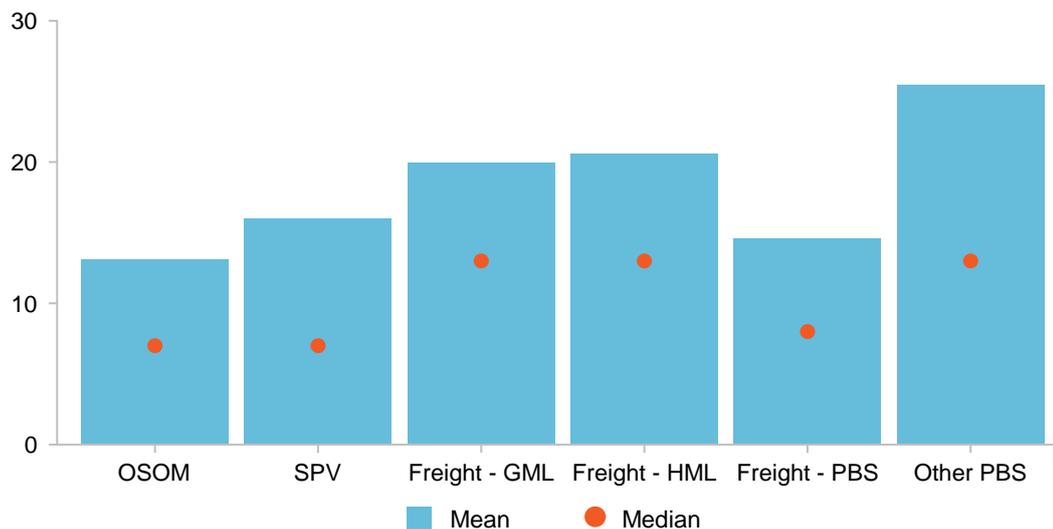
Figure B.7 Nearly half of all permit decisions were made within 7 days
Processing times, completed permit applications in 2018-19^a



^a Time taken from the date the application was submitted in the NHVR Portal to the date the road manager provided a decision (including NHVR and road manager processing times). A 'consent' is a road manager decision. 1401 consents took over 100 days to process and are not pictured in the chart. The chart also excludes most Class 1 permit applications in New South Wales and Queensland, which were not submitted via the NHVR.

Source: Commission estimates based on data from NHVR (unpublished).

Figure B.8 OSOM permit applications are quickest to assess^a
 Processing time (days), by vehicle type, completed permit applications, 2018-19



^a Time taken from the date the application was submitted in the NHVR Portal to the date the road manager provided a decision (including NHVR and road manager processing times). The chart excludes most Class 1 permit applications in New South Wales and Queensland, which were not submitted via the NHVR.

Source: Commission estimates based on data from NHVR (unpublished).

Gazetted networks

To assess changes in access for key freight vehicles since the introduction of the HVNL, the Commission analysed gazetted network data from NHVR over the period 2014–2019. The analysis is indicative of expanded access across most vehicle types, albeit with expansions primarily occurring on local roads in regional areas. Illustrative examples are presented below to support the conclusions about access changes discussed in chapter 7.

A caveat of this analysis is that it has not been possible to assess and verify access changes occurring across all vehicle types, jurisdictions and time periods due to data limitations (table B.10). Historical data for New South Wales are most comparable over time, hence the focus on this state in many of the examples below.

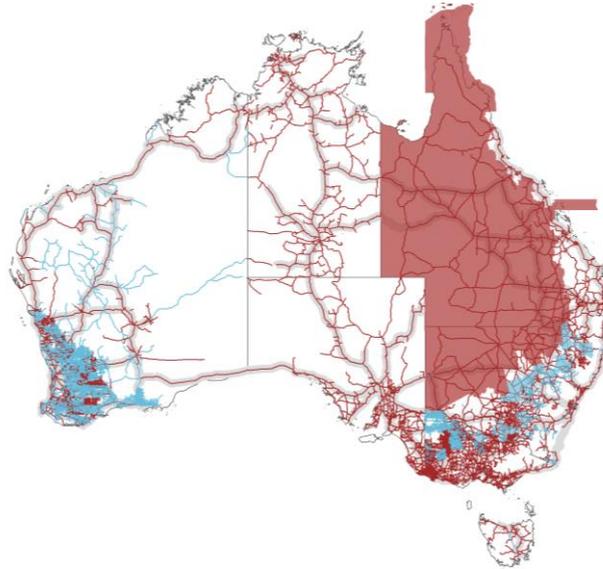
Access changes for B-doubles

As noted in chapter 7, the NHVR issued the National B-double Authorisation Notice in 2019 to address inconsistent access conditions and align B-double standards across states and territories. Comparisons of 2018 and 2019 25/26m B-double road networks indicate that while access expanded, the new routes were primarily on local roads and were not part of Australia’s key freight routes (figure B.9). This can be seen more clearly by focusing in on New South Wales (figure B.10). Similar to B-doubles operating at GML, there has been little improvement in access for HML B-doubles in recent years (figure B.11).

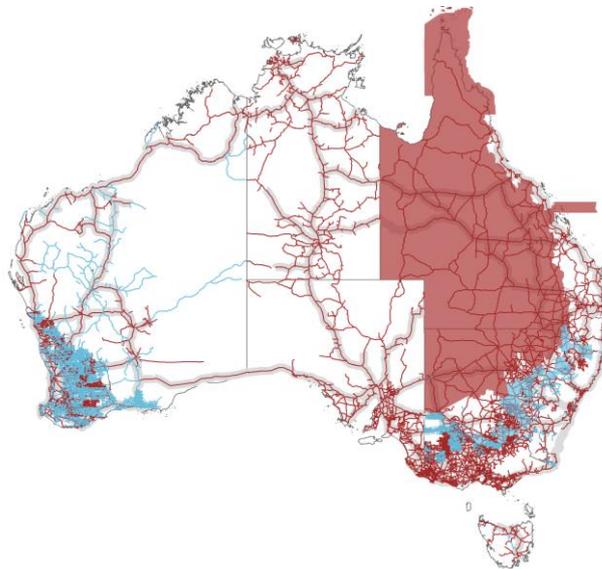
Figure B.9 **B-double access before and after the National B-double Authorisation Notice**

25/26m B-double network

May 2018



Sep 2019

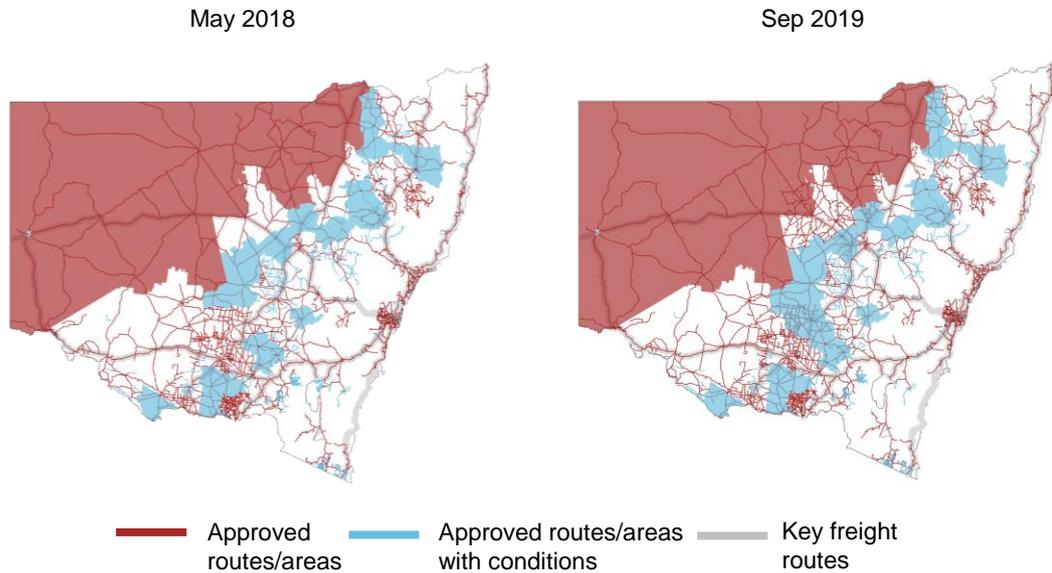


— Approved routes/areas — Approved routes/areas with conditions — Key freight routes

Sources: Reproduced using data from DITRDC (2019) and NHVR (unpublished).

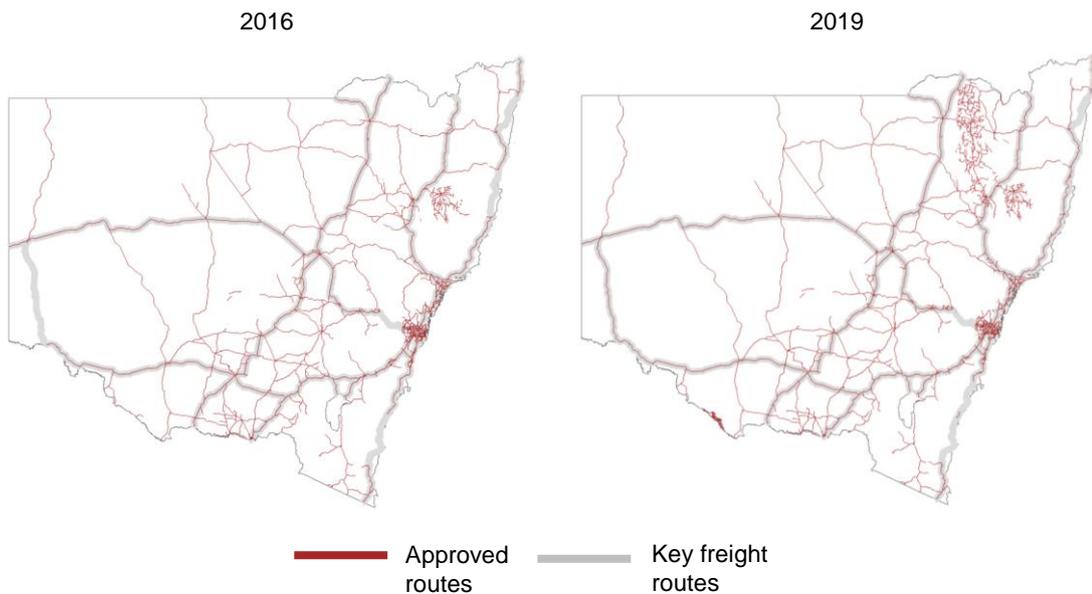
Figure B.10 **B-double access in New South Wales before and after the National B-double Authorisation Notice**

25/26m B-double network



Sources: Reproduced using data from DITRDC (2019) and NHVR (unpublished).

Figure B.11 **Gazetted network changes for HML 25/26m B-doubles in New South Wales^a**



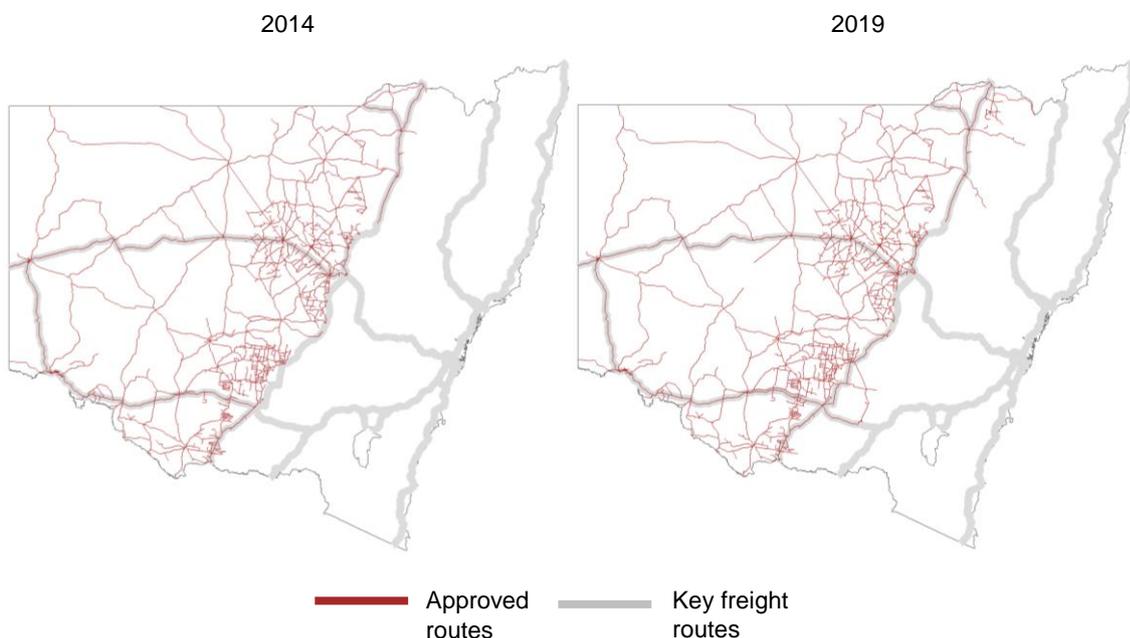
^a Approved areas not shown.

Sources: Reproduced using data from DITRDC (2019) and NHVR (unpublished).

Access changes for A-doubles

Comparisons of A-double networks over time also indicate only modest improvements in access. That said, as-of-right access opened up on some key freight routes. In the case of New South Wales (figure B.12), an important segment of the Newell Highway — a key link for freight transport between Victoria, Queensland and regional centres in western New South Wales — was gazetted for A-doubles operating at GML and CML.

Figure B.12 Gazetted network changes for 32/36m A-doubles in New South Wales^a



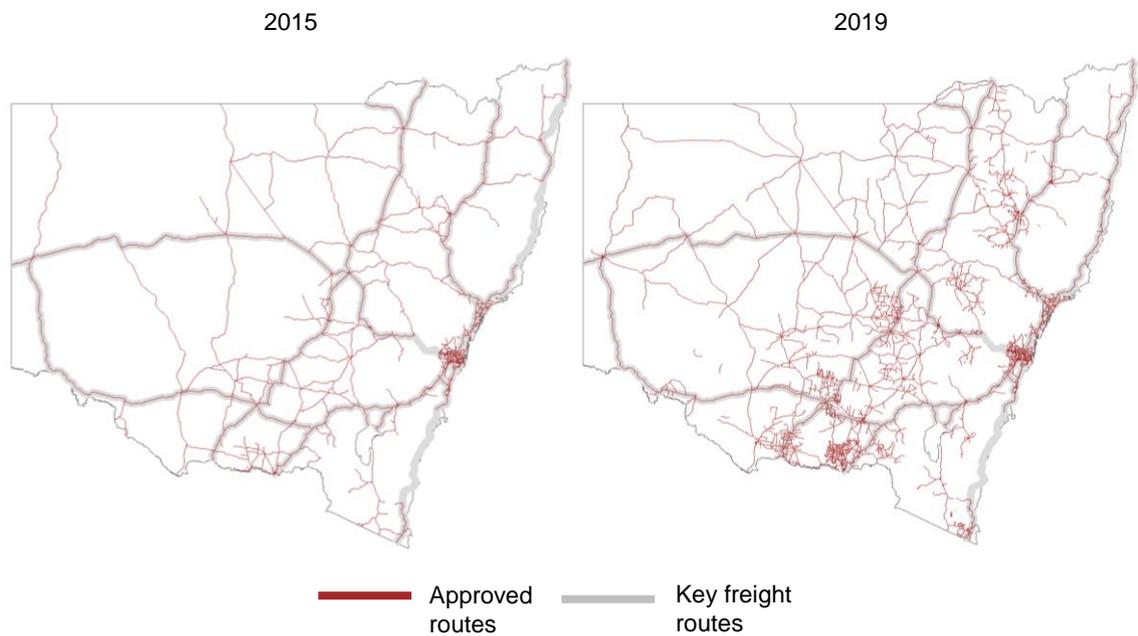
^a Approved areas not shown.

Sources: Reproduced using data from DITRDC (2019) and NHVR (unpublished).

Access changes for PBS vehicles

In contrast to other vehicle networks, there is evidence of more substantive growth in access for PBS vehicles. Networks for PBS level 2A vehicles (equivalent in operating condition to a 25/26m B-double) in New South Wales (figure B.13) and Victoria (figure B.14) increased between 2015 and 2019, including on several key freight routes.

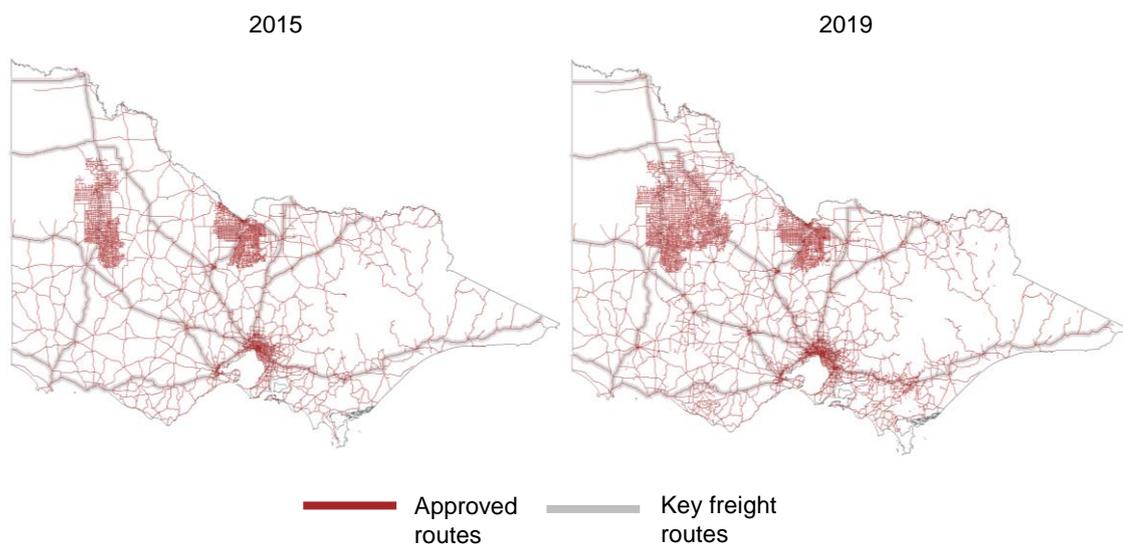
Figure B.13 **PBS level 2A network changes in New South Wales^a**



^a Approved areas not shown

Sources: Reproduced using data from DITRDC (2019) and NHVR (unpublished).

Figure B.14 **PBS level 2A network changes in Victoria^a**



^a Approved areas not shown

Sources: Reproduced using data from DITRDC (2019) and NHVR (unpublished).

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