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Economic benefits of improved regulation in the Australian trucking industry

Australian Trucking Association

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Deloitte Access Economics

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Glossary

Acronym	Full name
ABS	Australian Bureau of Statistics
ATA	Australian Trucking Association
ATC	Australian Transport Council
ATM	Aggregate Trailer Mass
COAG	Council of Australian Governments
GAV	General Access Vehicle
GVM	Gross Vehicle Mass
HML	Higher Mass Limits
HVNL	Heavy Vehicle National Law
IAP	Intelligent Access Program
LCV	Light Commercial Vehicle
NHVR	National Heavy Vehicle Regulator
NPV	Net Present Value
NTC	National Transport Commission
NTK	Net Tonne Kilometres
OSOM	Oversize Overmass
PBS	Performance-Based Standards
QTA	Queensland Trucking Association
RAV	Restricted Access Vehicle
SMVU	Survey of Motor Vehicle Use
VKT	Vehicle Kilometres Travelled
VOC	Vehicle Operating Costs

Executive summary

While Australia's economy is the 13th largest in the world, Australia's freight task is the fifth largest, showing the importance of freight to our standard of living (OECD, 2018a). This freight task will only grow in the future with expected high growth in Australia's Gross Domestic Product (GDP) and population over the coming decades. Given Australia's strong economic performance, the National Transport Commission (NTC) expects that freight will grow by 26%, to around 915 billion tonne-kilometres, by 2026 (National Transport Commission, 2016).

Trucking will play a central role in managing this rapidly growing transport task. The major strength of road over other methods of transport is its timeliness and flexibility over shorter distances and its ability to adapt to the specific needs of different types of freight. For instance, road plays a larger role than rail or coastal shipping in the freight task over short distances – with 75% of Australia's road freight being intrastate (National Transport Commission, 2016). Australia's extensive road network means that trucks can move time-sensitive freight (such as fresh produce, medicine and consumer goods) all around the country in a way that is most appropriate for the needs of each type of good. Ultimately, there is no competitive substitute for road when it comes to 'last mile' delivery.

Meeting the impending freight task will, however, require that the right policies are in place. For road, the policy imperative comes down to enabling the industry to use the most efficient vehicles for completing the door-to-door task at which road excels.

The use of modern, larger articulated vehicles (known as, heavy vehicles) allows for more freight to be carried in a single truck. With fewer trucks on the road, this reduces costs for the rest of economy and can reduce other negatives associated with freight such as congestion, noise and emissions.

In recent years, Australia's trucking industry has undergone a period of change in the approach to the regulation of heavy vehicles with attempts to move from a state and territory-based approach to a national approach. This has mainly focused on the establishment of the Heavy Vehicle National Law (HVNL) and National Heavy Vehicle Regulator (NHVR).

The HVNL regulates the use of heavy vehicles (over 4.5 tonnes gross vehicle mass) in all Australian states and territories except Western Australia and the Northern Territory. Introduced in 2012, the intent of the HVNL was to replace the previously fragmented regulatory system whereby each state and territory had its own laws. This fragmentation created a range of practical issues for the industry.

While improvements have been realised in some areas, industry has identified several challenges with the HVNL, which may be impeding the efficient and productive use of heavy vehicles to meet Australia's growing freight task. The key challenges relate to three main areas – Restricted Access Vehicles (RAVs), Higher Mass Limits (HML) and the Intelligent Access Program (IAP), and Oversize Overmass (OSOM) vehicles.

As summarised in Table i, many of the challenges that have been identified with the HVNL relate to inconsistencies across states and territories – this is despite the intent of the law to address the previously fragmented approach – as well as the lack of timeliness and transparency in decision-making.

It should be noted that, for this report we did not consult with industry broadly but instead relied on consultations with ATA, information gathered by ATA from its members, previous industry reviews and industry views from previous engagements.

Table i: Summary of industry-identified challenges with the HVNL

Area	Regulation	Industry-identified challenges
Restricted Access Vehicles (RAVs)	RAVs are vehicles for which there is a requirement to hold a permit or notice to operate on the HVNL road network.	• Absence of a streamlined and consistent approach to issuing permits across states and territories • A lack of transparency and timeliness in permit decisions • Particular difficulties encountered in obtaining permits for Performance-Based Standards (PBS) (higher productivity) vehicles
Intelligent Access Program (IAP) and Higher Mass Limits (HML)	The IAP is an application that uses satellite tracking and wireless communications technology to monitor where, when and how heavy access vehicles operate on the HVNL road network. In some jurisdictions, the ability to access HML is one of the incentives offered in return for taking up the IAP.	• Use of the IAP as a condition for HML access is inconsistent, and varies across HVNL jurisdictions • IAP is too costly, precise and stringent for its intended purpose • IAP is used for purposes other than its intended purpose
Oversize Overmass (OSOM) vehicles	As a subset of RAVs, OSOM vehicles are also required to hold a permit or notice to operate on the HVNL road network. OSOM permits may carry additional conditions, such as the need for a police escort vehicle, due to the special nature of the loads they carry.	• Inconsistency in permit processes across HVNL jurisdictions • A lack of timeliness and transparency in permit decisions • Differences in pilot and escort training and accreditation requirements across HVNL jurisdictions

As a result of these developments, the Australian Trucking Association (ATA) has commissioned Deloitte Access Economics to produce a report that analyses the current state of regulations for heavy vehicles in the Australian trucking industry and the potential benefits of improved approaches to regulation.

There are a number of reforms that industry and government could pursue to address the challenges and realise the benefits of increased heavy vehicle access. An ambitious approach could take advantage of new and emerging digital technologies to transform the current access application process. This would involve streamlining logistics and route planning to integrate existing vehicle technology and datasets on the road network to allow access determinations to be made in close to real time. The approach would involve road managers and road users (i.e. operators and drivers) all contributing road management and vehicle data and the National Heavy Vehicle Regulator (NHVR) collating and centrally processing that data in a single system.

The time, resources and collaboration required to implement such a technological solution means that it would not be an immediate solution to the challenges the industry faces. As such, in the interim, governments could consider and pursue improvements that deal directly with the current regulatory system. Interim policy suggestions are summarised in Table ii below. We have not, in this report, undertaken a cost-benefit, or similar, analysis to understand whether there is a business case for implementing such reforms. Rather the purpose of these suggestions is to start the conversation on potential improvements that could be made to the regulations.

Table ii: Interim policy suggestions

Key theme or principle	Area of policy being addressed	Policy suggestions
Promoting national consistency and certainty in heavy vehicle regulation	All	**1:** Support and implement, where appropriate, the findings of the Review of the HVNL with a view to promoting greater national consistency and uniformity, particularly in the areas of IAP being a condition for HML access and OSOM pilot and escort vehicle training and accreditation requirements.
	RAVs, OSOM vehicles	**2:** Conclude the NVHR's interim delegation arrangements with states and territories.
	RAVs, OSOM vehicles	**3:** Amend the HVNL such that there is: • a *maximum* time period within which road managers must decide consent (subject to exceptions) (in section 156 of the HVNL); and • a legislative balancing exercise requiring road managers to consider both the *benefits* and *costs* of giving consent (in section 156A of the HVNL).
	RAVs, OSOM vehicles	**4:** Mandate the use of the NHVR's *Approved Guidelines for Granting Access* by all HVNL road managers.
	RAVs, OSOM vehicles	**5:** Consider the need for, and costs and benefits associated with, implementing an external, independent review process (e.g. through a tribunal) for access decisions.
Improving communication and coordination between the NHVR, road managers and external bodies	RAVs, OSOM vehicles	**6:** Increase staffing for training and education programs targeted at local road managers regarding RAV permit processes (particularly in the use of the NHVR's *Approved Guidelines for Granting Access*).
	RAVs, OSOM vehicles	**7:** Update the evidence base around the costs and benefits of high productivity freight vehicles (HPFVs) and ensure this updated evidence is communicated effectively to road managers.
	RAVs, OSOM vehicles	**8:** Introduce case managers and liaison officers into the RAV and OSOM permit process with the aim of facilitating greater communication and coordination between RAV permit processes and external processes (such as pilot/escort vehicle approvals, utility clearances, bridge assessments and rail crossing approvals).
	OSOM	**9:** Encourage, where reasonable, the use of industry pilot vehicles or traffic warden-operated escort vehicles over police escort vehicles for OSOM vehicles.
Implementing the most technologically-advanced and cost-efficient regulatory solution possible	RAVs, OSOM vehicles	**10:** Adopt the ARRB's RAVRAT at all road manager levels (state, territory and local) in the assessment of whether or not to provide consent for a RAV permit (under section 156 of the HVNL).
	IAP	**11:** Adjust the operational rules of the IAP to reduce the number of false positive non-compliance reports and support the sharing of non-compliance reports with operators and drivers, and provide non-compliance reports and alerts of safety and infrastructure risks in real-time.
	IAP	**12:** Prevent road manager use of the IAP for purposes other than heavy vehicle access and compliance management. In turn, make available new low-cost, low-assurance telematics applications to road managers to address their needs in relation to road asset management and planning.
	IAP	**13:** Investigate other regulatory telematics applications as possible low-cost alternatives to IAP for heavy vehicle access and compliance management.
	RAV, OSOM vehicles	**14:** Consider technology-based solutions to align and coordinate the RAV permit processes and other external processes (such as pilot/escort vehicle approvals, utility clearances, bridge assessments and rail crossing approvals).
Road managers need to have influence over access to their road network and need to be appropriately compensated	RAVs, OSOM vehicles	**15:** In line with the HVRR, a funding arrangement should be established, in which road managers receive a percentage of access permit fees received by the NHVR in return for processing applications in a timely manner. In cases where road manager consent is untimely, the fee should be returned to the applicant.
	OSOM	**16:** In line with the HVRR, a special project permit should be introduced for OSOM vehicles, in which a higher fee is charged for the ability of the applicant to determine a date when a final permit decision must be made. This additional fee would be subject to a refund if road manager consent is untimely.

Our estimates indicate that addressing challenges in the use of modern, larger articulated vehicles and therefore, increasing the contribution of these vehicles to meeting Australia's freight task, has the potential to generate significant benefits for Australia's economy (excluding Western Australia and Northern Territory). Over the period, 2020 to 2050, we estimate that it could lead to:

- **$13.6 billion in cost savings (in net present value terms)**. This translates to a cost saving of 3.1% over the entire period, and by 2050, vehicle operating costs are estimated to be 3.7% less each year, generating benefits of some $1.8 billion a year (today's dollars, realised in 2049-50).
- **$0.5 billion reduction in transport externalities (in net present value terms)** (such as pollution, noise and greenhouse gas emissions but excluding the cost of crashes). This translates to a 0.3% saving over the entire period, and by 2050, externalities are expected decrease by 0.5% each year.

While the level of cost savings for the trucking industry itself from increasing heavy vehicle access are substantial, pursuing reform to the trucking industry is made even more important due to trucking's extensive role as an input into all other industries in the Australian economy.

For example, when measured in dollar terms, intensive users of trucking include the lumber industry (where trucking is around 10% of industry costs), and cement, wood manufacturing, grain manufacturing and textile manufacturing (all, around 5% of industry costs). Cost savings to the trucking industry could work to directly reduce the costs faced by other industries. For instance, under the scenario where trucking costs are estimated to be reduced by 3.1% in the long-run, this could potentially amount to **a reduction in costs for Australian industries of around $0.9 billion a year by 2050** if savings are fully passed through the supply chain.

From the consumer's point of view, trucking is an important component of most consumption items – every item on the shelf at shops from milk to bread to clothing and shoes requires trucking to support them. After accounting for the full range of inputs required we estimate that trucking accounts for:

- 5.1% of the cost of textiles;
- 4.4% of the cost of beer;
- 4.1% of the cost of fruit and vegetables;
- 3.9% of the cost of furniture;
- 3.5% of the cost of milk;
- 3.5% of the cost of bread and baked goods
- 2.4% of the cost of soft drinks
- 2.0% of the cost of personal electronics; and
- 1.8% of the cost of building materials.

All up, to meet the needs of household consumption we estimate that there is around $9.2 billion a year of trucking activity in Australia. If our policy suggestions were implemented and trucking costs fell, due to the use of more efficient vehicles, we estimate that this could potentially result in a **reduction in costs for consumers in the economy of some $352 million a year in the long run** (today's dollars, realised in 2049-50) if savings are fully passed through the supply chain**.**

The benefits seen in the modelling results come mainly from the use of more productive trucks. More productive trucks are able to carry more cargo per journey as they are both larger and better designed to carry heavier loads while maintaining safety, movement and road wear performance. While these trucks cost more to operate in total, they actually result in a lower cost per tonne of freight. This means that the overall freight task can be completed at a lower cost when more productive vehicles are used.

Over the period to 2050, adopting the proposed policy changes could mean…

$13.6 billion

decrease in vehicle operating costs

$0.5 billion

decrease in externalities

These changes could provide annual benefit to other Australian industries of…

$80 million
Wholesale trade

$70 million
Construction services

$40 million
Retail trade

$30 million
House construction

$30 million
Meat processing

1 Introduction

In recent years, Australia's trucking industry has undergone a period of change in the approach to the regulation of heavy vehicles with attempts to move from a state and territory-based approach to a national approach. This has mainly focused on the establishment of the Heavy Vehicle National Law (HVNL) and National Heavy Vehicle Regulator (NHVR).

The HVNL has been in operation now for over four years – long enough to develop a clear picture of where this reform has been successful and where further improvements are possible. In particular, the Regulation Impact Statement (RIS) prepared to support the implementation of the HVNL and NHVR indicated significant economic benefits associated with Restricted Access Vehicles (RAVs), the Intelligent Access Program (IAP) and Oversize-Overmass (OSOM) vehicles. However, industry has identified several challenges with the regulations. These challenges broadly relate to inconsistencies across states and territories, despite the intent of the law to address the previously fragmented approach, and a lack of timeliness and transparency in decision-making.

It should be noted that, for this report we did not consult with industry broadly but instead relied on consultations with ATA, information gathered by ATA from its members, previous industry reviews and industry views from previous engagements.

At the other end of the regulatory spectrum, the Heavy Vehicle Road Reform program, which focuses on charging and infrastructure, is entering phase 2 of its implementation, where there will be a significant need to refine proposed regulatory approaches in order to ensure benefits for industry, households and the economy generally. There is a strong relationship between this program and issues of RAVs, IAP and OSOM vehicles.

As a result of these developments, the Australian Trucking Association (ATA) has engaged Deloitte Access Economics to analyse the current state of regulations for heavy vehicles in the Australian trucking industry and the potential benefits of improved approaches to regulation. In particular, ATA identified RAVs, the IAP, and HML and OSOM vehicles as the regulatory areas for focus.

The remainder of this report is set out as follows:

- **Chapter 2** provides an overview of Australia's trucking industry today, including the role of trucking in meeting Australia's freight task, and the structure of the trucking industry.
- **Chapter 3** summarises the current regulatory landscape for Australian trucking including key events that led to the development of the HVNL and NHVR, and its forecast benefits.
- **Chapter 4** discusses industry challenges that have arisen with the current regulatory system in three key areas: RAVs, the IAP and Higher Mass Limits (HML), and OSOM vehicles.
- **Chapter 5** presents policy suggestions to the regulatory system to address identified challenges.
- **Chapter 6** models the economic benefits that could be achieved by improving the current approach to trucking regulation for heavy vehicle access. **Appendix A** provides detailed information about our approach to modelling. **Appendix B** provides a breakdown in the estimated cost savings for each industry. **Appendix C** provides a breakdown of the estimated cost savings for household expenditure on everyday items.

Australia's trucking industry

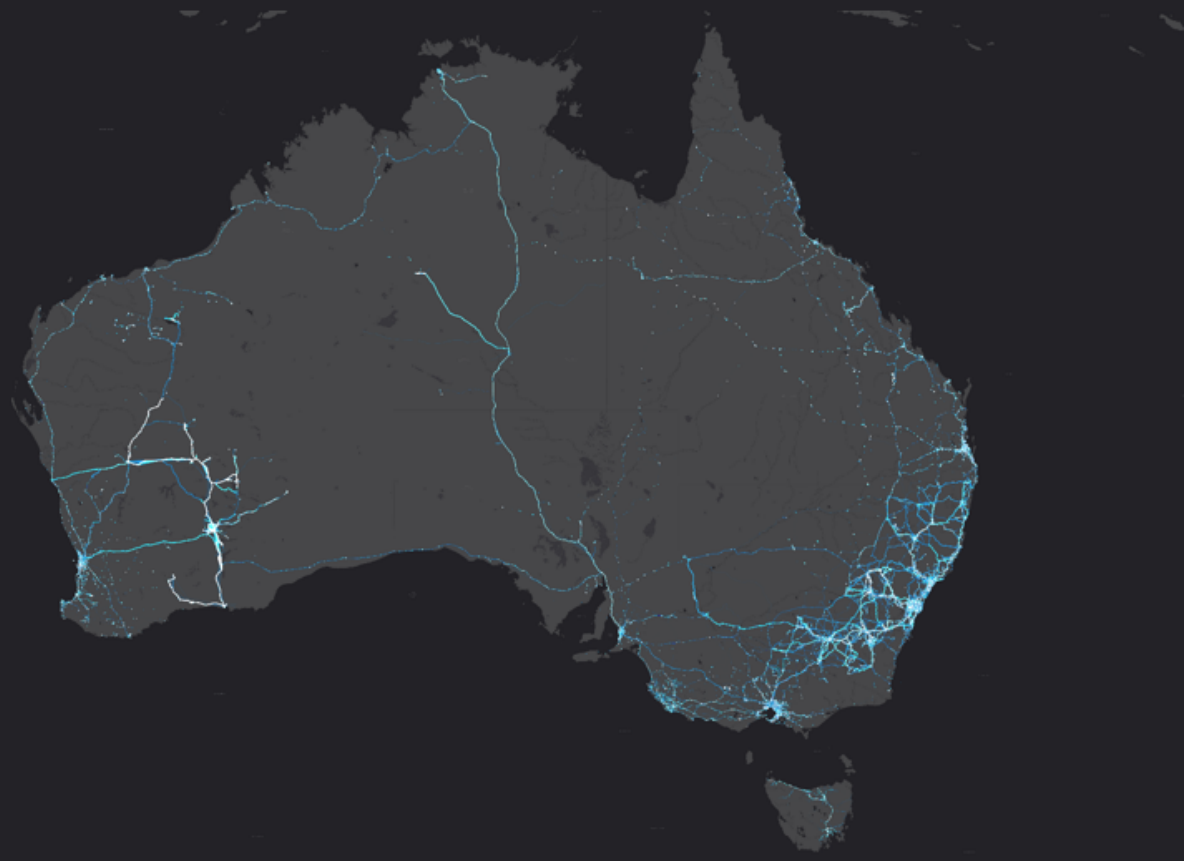
Over 214 billion tonne kilometres (or just under one-third of Australia's freight task) was moved by road in 2015-16 [1]

Road plays a large role in moving freight task over short distances:

- 75% of road freight is intrastate movements [2]
- the most used routes for road transport are along the coast between Adelaide and Brisbane, through Melbourne and Sydney [3]

Road also plays a role in moving large-scale infrastructure to inaccessible locations

Road freight transport employed more than 204,500 people in the November 2018 quarter [4]



Source for chart: Deloitte Access Economics, Routes of select trucking operators.

1: BITRE (2017), 2: National Transport Commission (2016), 3: BITRE (2014), 4: ABS (2018d)

2 The industry today

2.1 The freight challenge

Australia's freight task is the fifth largest in the world (OECD, 2018a). In 2015-16, 738 billion tonne-kilometres of freight was transported around the country (BITRE, 2017). Australia's freight task requires road, rail, sea and air to work together to move goods to where they need to be, when they need to be there and to do so efficiently.

This task will only grow in the future. Australia's population growth rate is among the highest of OECD nations (OECD, 2018b). By 2066, Australia's population is expected to have almost doubled to 43 million people (ABS, 2018a). This growth will not be evenly spread; it will be concentrated in major cities. By 2066, there will be an additional 5.4 million people living in Melbourne, and 4.7 million in Sydney (ABS, 2018a).

The freight story is similar, but more extreme. Freight growth follows Gross Domestic Product (GDP) growth, and given Australia's strong economic performance, freight is expected to grow by 26%, to around 915 billion tonne-kilometres, by 2026 (National Transport Commission, 2016).

Trucking will play a central role in managing this rapidly growing transport task. The major strength of road over other methods of transport is its timeliness and flexibility over shorter distances and its ability to adapt to the specific needs of different types of freight. Ultimately, there is no substitute for road when it comes to 'last mile' delivery. Australia's extensive road network means that trucks can move time-sensitive freight (such as fresh produce, medicine and consumer goods) all around the country in a way that is most appropriate for the needs of each type of good.

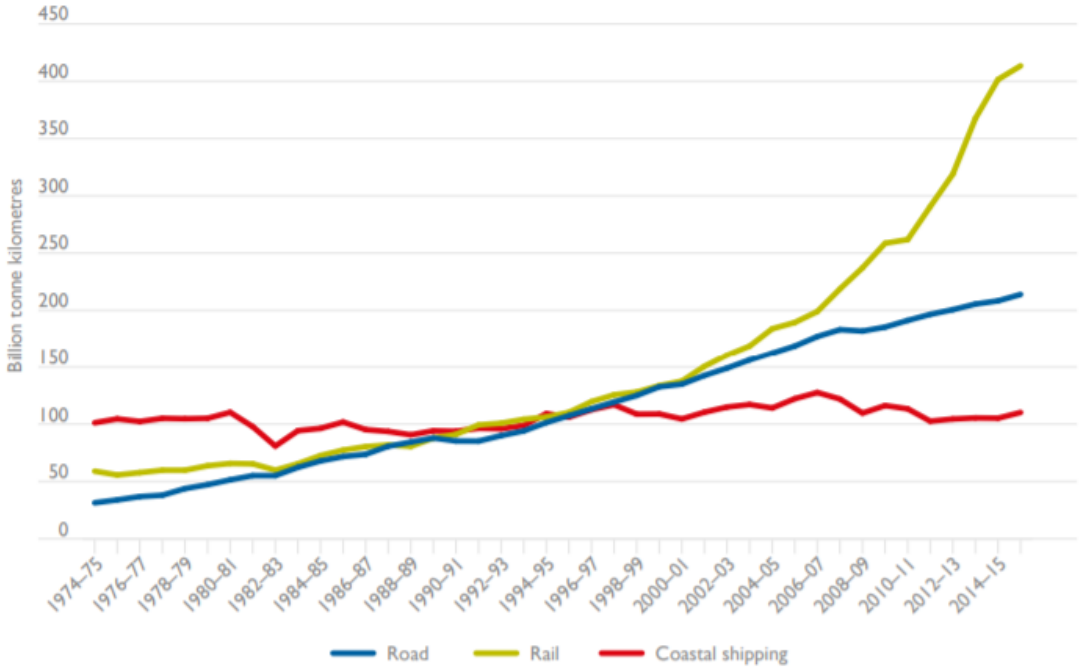
However, a coordinated approach will be needed to accommodate this rapidly growing and increasingly complex freight task. All transport modes will need to work collaboratively, specialising where they have a competitive advantage. Using road for the 'last mile' after goods are transported long distances using rail or ship makes all of Australia accessible at a lower cost than using any one transport option in isolation.

Getting the most out of each mode of transport, and meeting the freight challenge, will require the right policies to be in place. Each mode faces its own challenges and excels in different areas. For road, the policy imperative comes down to enabling the industry to use the most efficient vehicles for completing the door-to-door task at which road excels and doing so in the safest and most environmentally friendly manner.

2.2 Size of the freight task

The total freight task in Australia was 738 billion tonne-kilometres in 2015-16 (BITRE, 2017). Just under one-third (29%) of this was moved by road. However, this figure understates the importance of road in completing the freight task, as rail and shipping are used to transport relatively low value and bulky goods over long distances and so have a larger share of tonne-kilometres travelled.

Chart 2.1: Domestic freight task, by mode of transport



Source: BITRE (2017)

Road plays a large role in the freight task over short distances, with three-quarters (75%) of road freight being intrastate movements (National Transport Commission, 2016). In 2015-16, 146 billion tonne-kilometres of intrastate freight was moved by road (BITRE, 2017).

Road freight has grown an average of 5% per annum since the 1970s (see Chart 2.1). This growth has significantly outstripped growth of the total freight task, so that the share of freight moved by road has increased from 16% in 1974-75 to 29% in 2015-16 (BITRE, 2017). Over this period, Western Australia has experienced the highest growth in total interstate road freight (averaging 6% per annum) while Brisbane has the highest growth in capital city road freight (6.5%) (BITRE, 2016).

Major users of road freight are the crude material and chemical (51% of demand for trucking), manufactured goods (27%) and agricultural output (15%) industries (IBISWorld, 2018). These industries use road freight to transport inputs to production to factories, and finished goods to warehouses and retail locations. As such, two-thirds of freight moved by road is non-bulk goods (BITRE, 2017).

But road is not only used for smaller goods, trucks are also used to move large-scale infrastructure to inaccessible locations. Wind turbines, for example, need to be moved around Australia to inland locations without rail access. In these situations, Australia's road network is used instead.

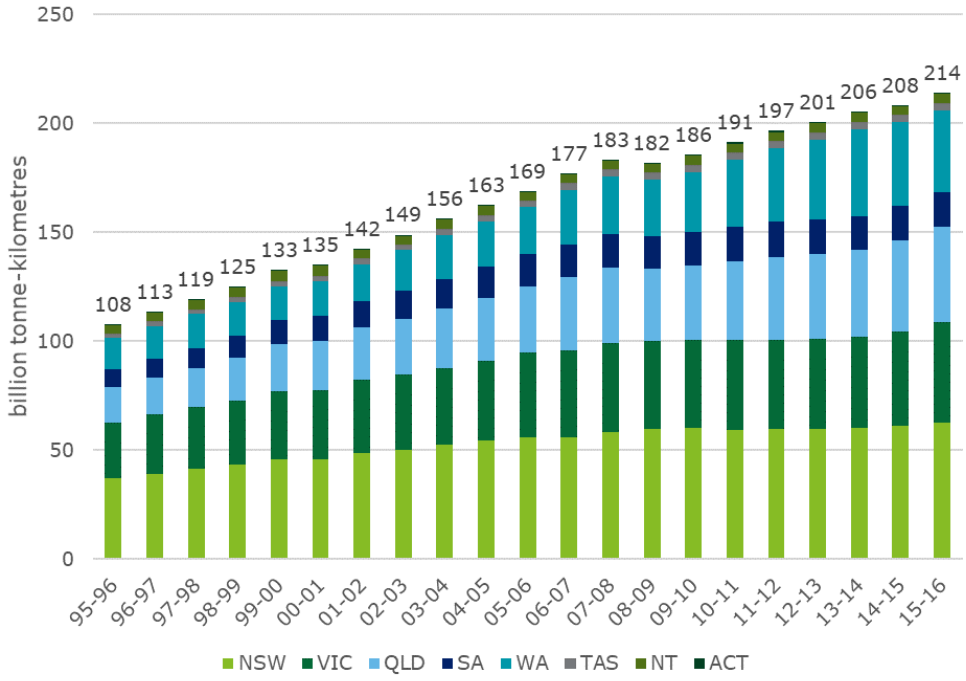
Figure 2.1: The Australian major road network

Source: BITRE (2017)

There is more than 870,000 kilometres of road across Australia (BITRE, 2017), and government is funding significant infrastructure projects to expand the reach of the network and enhance its capacity. For example, the construction of NorthConnex and WestConnex in Sydney, the Perth airport gateway and Northlink in Western Australia, and upgrades to the Hume, Pacific and M1 highways and the Monash freeway in Victoria. In 2015-16, governments spent $22.8 billion on maintaining and improving the Australian road network (BITRE, 2017).

In line with population density, NSW is the largest user of road to move freight, with 63 billion tonne-kilometres moved in 2015-16 (see Chart 2.2). NSW is followed by Victoria (46 billion tonne-kilometres), Queensland (44 billion tonne-kilometres) and Western Australia (37 billion tonne-kilometres). The share of the road freight task between states and territories has remained reasonably consistent since 1995-96.

Chart 2.2: Total domestic freight moved by road, by state/territory



Source: BITRE (2017)

Road is used to move freight throughout Australia, but the most used routes are along the coast between Adelaide and Brisbane through Melbourne and Sydney (BITRE, 2014). Again, these trends are in line with where Australia's population lives, the size of local economies and road's strength in moving relatively higher value commodities through complex production and supply chains.

Significance to the economy

Trucking is important to the Australian economy, both directly through the size of the industry, and indirectly through the other economic activity it enables. Australia has the fifth largest freight task in the world (National Transport Commission, 2016), and a large land mass with a relatively sparse population. All this means that moving goods efficiently around the country is critical.

Demand for road freight is a leading indicator of economic health (IBISWorld, 2018). This is because businesses will require more freight movements when they have large volumes of inventory to move, indicating economic growth.

Trucking is a labour intensive industry, employing over 204,500 people in the November quarter of 2018 (ABS, 2018d).[1]

The wider transport industry accounted for $77 billion in GDP (4.6% of GDP) in 2015-16, and road transport activity generated $137.2 billion in economic output (ABS, 2018c).

In 2017-18, the road transport industry's revenue was $49 billion. Revenue has been growing at an average of 0.4% annually for the last five years (IBISWorld, 2018).

[1] This is total employment in the Road Freight Transport industry.

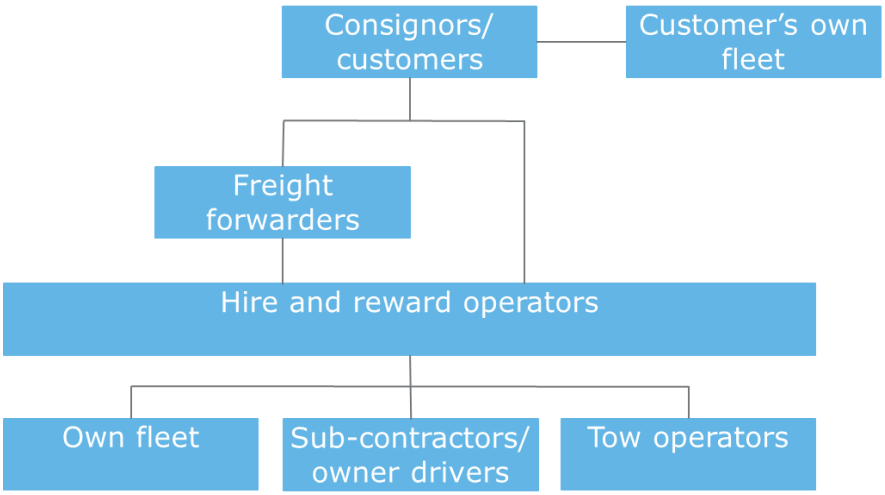
2.3 Road transport industry structure and key players

The structure of the trucking industry is complex and covers small operators with a single vehicle through to multinational fleet operators. The industry covers those who only operate trucks and those who provide transport across modes. The industry also covers those who may not own or operate their own equipment but focus on coordination (e.g. freight forwarders).

Ancillary operators are businesses whose main activity is something other than transport, but they have truck fleets to transport their own products. Ancillary operators are not considered to operate within the trucking industry for the purposes of this report.

Figure 2.2 shows, at a high level, how businesses that operate trucks can be classified and how they interact.

Figure 2.2: Trucking industry structure



Source: Adapted from ACIL Tasman (2004).

Hire and reward operators have decreased in number over the last decade, and now make up around 45% of the market (National Transport Insurance, 2016). This trend has been driven by consolidation in the industry and growth in larger, generally more efficient, businesses.

Subcontracting plays an important role within the hire and reward fleet. Many of these subcontractors are owner-operators with no employees. Less than 0.5% of all operators own a fleet of more than 100 trucks, and 70% have just one truck in their fleet (National Transport Insurance, 2016).

While not the focus of this report, freight forwarders are another important component of the industry. These businesses organise for multiple small shipments to be consolidated and loaded onto a truck, but do not own the trucks they organise. Their main role is facilitating freight movement for smaller businesses without a dedicated transport solution.

IBISWorld reports that the trucking industry is highly competitive. In 2016-17, businesses in the broader Road Transport industry had a profit margin of 9.7% (ABS, 2018f),[2] and, according to most recent estimates, there are approximately 50,000 trucking businesses (in road freight transport) in Australia (ABS, 2018e).

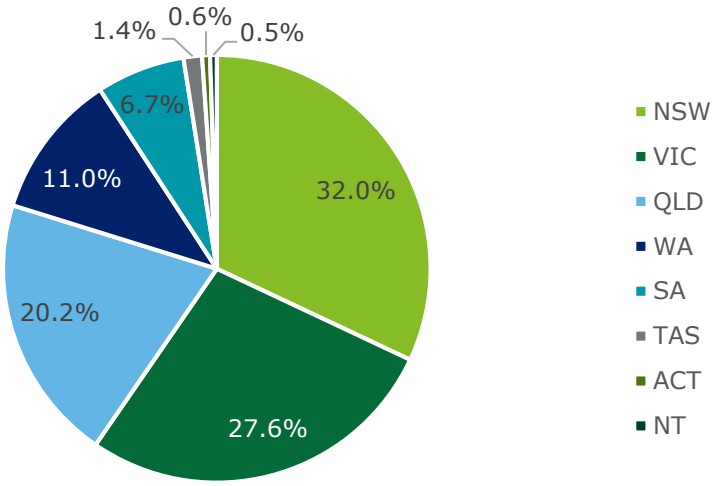
[2] This is calculated based on operating profit before tax, and total income.

There is low market concentration; major players include:

- Toll Holdings - market share 7.8%[3]
- Linfox Pty Ltd - market share 4.0%-5.0%
- K&S Corporation Ltd - market share 1.0% to 2.0%

In line with demand for road freight services, around one-third (32%) of trucking operators are based in NSW, another 28% are in Victoria and the rest are scattered around Australia (Chart 2.3).

Chart 2.3: Location of trucking operators

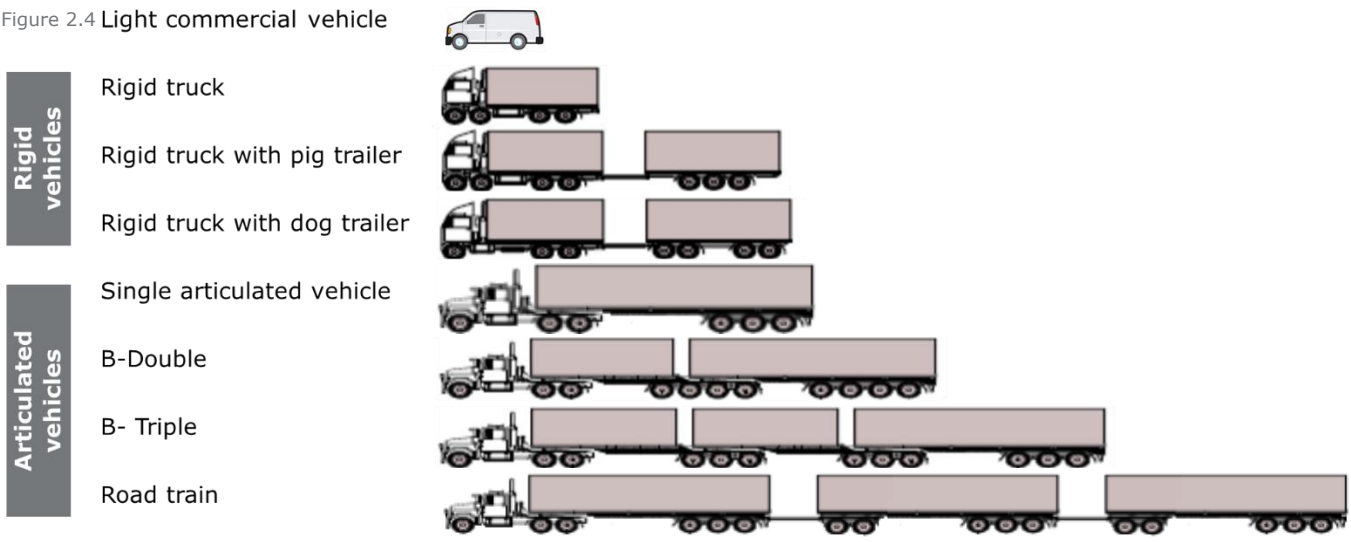


Source: IBISWorld (2018)

Figure 2.3 provides a summary of the major types of trucks used to move freight in Australia. Around 80% of road freight kilometres are carried out by articulated trucks, with the remaining 20% split between rigid trucks and light commercial vehicles (LCVs) (see Figure 2.3). The use of larger articulated vehicles allows for more freight to be carried in a single truck. This reduces costs for the rest of economy and can also reduce other negatives associated with freight such as the total level of congestion, noise and emissions.

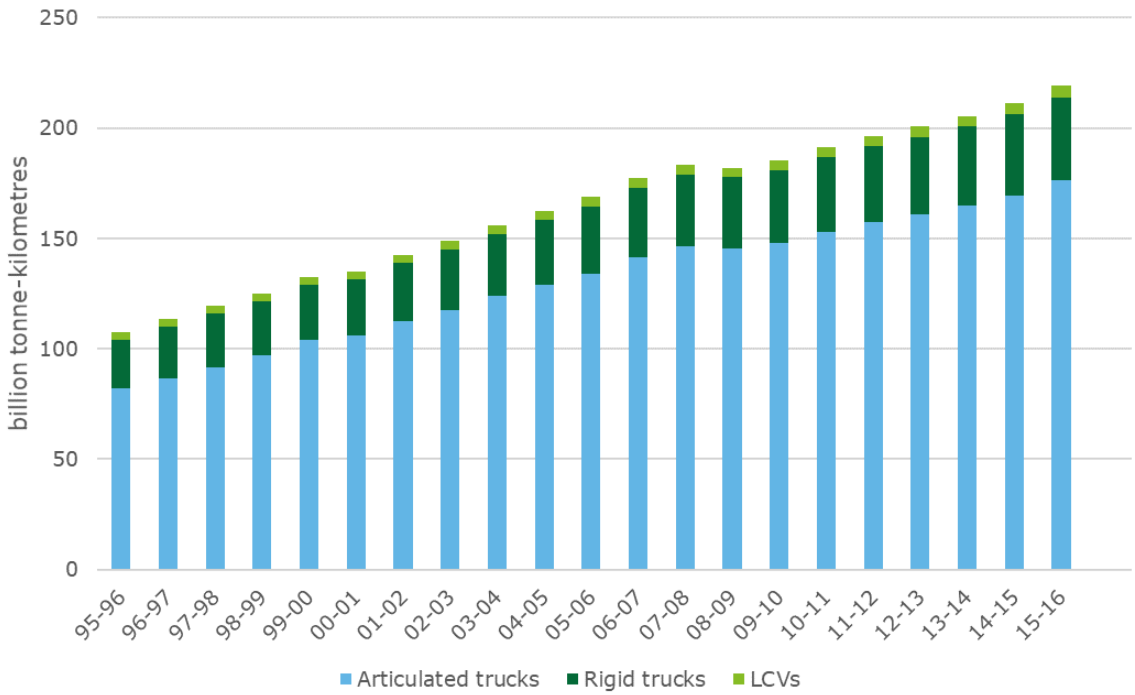
[3] This is share of industry revenue in 2017-18. IBISWorld defines the industry as "operators who primarily transport freight by road. The industry also includes towing services and delivery road services, excluding couriers. In-house use of fleet vehicles in mining, retail and construction are excluded from the industry".

Figure 2.3: Types of trucks used



Source: Adapted from ATA (2016) *Description of truck configurations*.

Chart 2.4: Total freight vehicle kilometres travelled, by vehicle type



Source: BITRE (2017).

3 Heavy Vehicle Regulation

This Chapter provides an overview of the current regulatory landscape for the Australian trucking industry, including the development of the Heavy Vehicle National Law (HVNL) in 2012.

3.1 Background on regulation in trucking

Regulation in the Australian trucking industry has undergone significant reform over the past few decades with attempts to move from a fragmented approach to a more efficient national approach.

3.1.1 Challenges of a fragmented approach

Historically, Australian states and territories operated different regulatory regimes in the use of heavy vehicles. For example, in NSW, the *Road Transport (Vehicle and Driver Management) Act 2005* (NSW) provided much of the registration, licensing, safety and standards for use of heavy vehicles on local roads. The *Road Traffic Act 1961* (SA), in contrast, served as the main operative Act regulating the use of heavy vehicles in South Australia.[4]

In 1991, the National Road Transport Commission (now the National Transport Commission (NTC)) was set up to address the lack of uniformity between these Acts and to promote a more nationally consistent approach to road regulation.[5] It developed non-binding model laws, which states and territories could adopt, in areas such as heavy vehicle standards and registration, Oversize and Overmass (OSOM) vehicles and Higher Mass Limits (HML).

Despite this, states and territories continued to operate divergent heavy vehicle regulatory regimes. Differences in law enforcement systems, drafting preferences and operational realities often meant that states and territories would only implement the NTC's model laws in part or, in some cases, not at all (National Transport Commission, 2011).

As time passed, this fragmented regulatory system began to create practical issues for the Australian trucking industry. Cross-border movements became increasingly complex. Operators were not only required to comply with multiple regulatory regimes, but to also bear the overlapping costs under each regime (National Transport Commission, 2011).

Differences in regulation also meant that operators were often forced to use less efficient trailer types or longer routes so as to be compliant with all relevant regulatory regimes on their route (National Transport Commission, 2011). One study into the Riverland winemaking region found that wine producers were effectively being forced to use less efficient semi-trailers to comply with regulation across all the states, while road trains would have been the most efficient heavy vehicle for such trips (Australian Logistics Council, 2009). The study estimated that the use of semi-trailers in NSW, Victoria and South Australia came at an additional cost of between $1.6 to $2.0 million over road trains to the region's wine producers each year (Australian Logistics Council, 2009). With higher transport costs, there was further pressure on producers more generally to increase prices and pass on costs to consumers.

Expansion into interstate markets was further limited by the regulatory system. For the most part, operators had little incentive to expand beyond a local jurisdiction, given their familiarity with the regulatory regime there (National Transport Commission, 2011). Any operators, who were able to expand, were typically larger market players with significant resources to cover the high

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[4] The *Motor Vehicles Act 1959* (SA) also regulated the use of heavy vehicles in SA during this time, albeit to a lesser extent. That Act provided a registration process for heavy vehicles, as well a speeding control scheme.
[5] The National Road Transport Commission was originally established under the *National Road Transport Commission Act 1991* (Cth) as an independent statutory body for developing nationally consistent regulatory and operational reforms for the road industry. Following a 2002 review and the passing of the *National Transport Commission Act 2003* (Cth), the National Road Transport Commission was renamed the National Transport Commission and its role was formally expanded to also developing nationally consistent regulatory and operational reforms for the rail and intermodal transport industries.

information costs of becoming familiar with, and managing other, regulatory regimes (National Transport Commission, 2011).

These issues, among others, led the Council of Australian Governments (COAG) to agree to reform the system in 2009. Rather than having divergent state and territorial acts, a single national system of heavy vehicle laws known as the HVNL was to be established. Those laws were to be administered by a sole independent national regulator known as the National Heavy Vehicle Regulator (NHVR).

3.1.2 Expected benefits of a national approach

Following the formalisation of the COAG decision in the *Intergovernmental Agreement on Heavy Vehicle Regulatory Reform*, the Australian Transport Council (ATC) and the NTC set about the task of developing the proposed HVNL and the NHVR.

Early COAG discussions had envisaged that the HVNL would be based on the NTC's model laws (National Transport Commission, 2011). While the ATC worked on a framework for the HVNL, the NTC's main task was to consolidate its model laws into a single law and to draft additional provisions establishing the NHVR.

By 2011, a draft version of the HVNL was ready and a Regulation Impact Statement (RIS) was ordered to assess its impact on industry and the broader economy. The resulting report – the *Heavy Vehicle National Law Regulation Impact Statement September 2011* – identified 368 differences between the existing system and the proposed HVNL, 34 of which were deemed to have potentially medium-to-high impacts on the economy if enacted (National Transport Commission, 2011). It estimated that:

- there were between $5.6 and $12.4 billion in possible net benefits from enacting all 368 changes in the proposed HVNL – most of the benefits concentrated in gains from the harmonisation of Restricted Access Vehicles (RAVs), HML and the Intelligent Access Program (IAP) regulations.
- five of the 34 medium-to-high impact changes would carry even greater economy-wide benefits of between $9.0 to $31.1 billion using a "bottom-up" analysis.
- implementing the HVNL and establishing the NHVR would come at a total cost of around $1.3 billion in net present value (NPV) terms over a 20-year period (National Transport Commission, 2011).

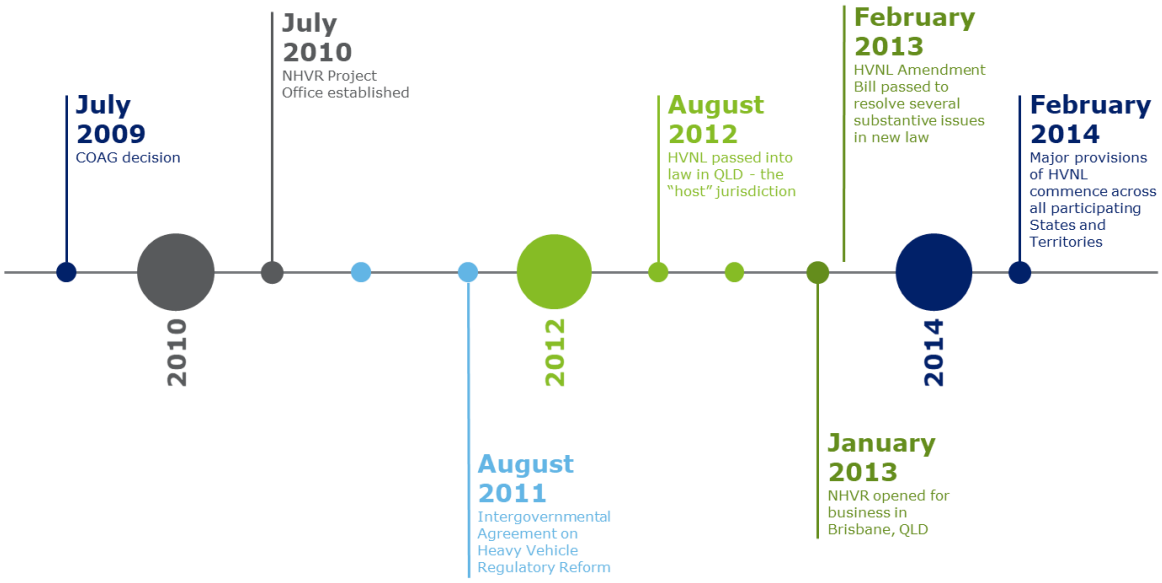
On 23 August 2012, three years after the initial agreement, the HVNL was passed into Queensland law as a Schedule to the *Heavy Vehicle National Law Act 2012* (Queensland).[6] As "host" jurisdiction, Queensland additionally became the operating base of the NHVR.

All states and territories except Western Australia and the Northern Territory followed suit shortly after and passed enabling legislation, providing for the application of the HVNL within their own jurisdictions. The HVNL came into operation on 10 February 2014.

Figure 3.1 summarises the key developments leading up to the establishment of the HVNL and the NHVR.

[6] Given that the Commonwealth Parliament does not possess powers to legislate with respect to "transport" under section 51 of the Australian Constitution, the HVNL had to be designed as a cooperative applied law scheme (NHVR, 2018c). Such a scheme works by having one state/territory jurisdiction (the "host" jurisdiction) enact a law within its jurisdiction (generally known as a "National Law" and passed as a Schedule to an Act of the host jurisdiction) and then, having other jurisdictions ("participating" jurisdictions) pass "enabling" legislation which applies that national law in their specific jurisdiction.

Figure 3.1: The establishment of the HVNL and the NHVR



Source: Adapted from the National Heavy Vehicle Regulator's *An industry guide to access under the Heavy Vehicle National Law* (2013) report.

About the HVNL and NHVR

At present, the HVNL is made up of the *Heavy Vehicle National Law Act 2012* (Qld), five enabling Acts and a number of subordinate state and territory regulations mostly relating to heavy vehicle standards, mass, dimension and loading requirements, and fatigue management. It sets out and clarifies the national approach with respect to a number of matters, including:

- heavy vehicle standards and safety;
- mass, dimension and loading requirements;
- OSOM vehicle exemptions;
- use of RAVs;
- heavy vehicle driver fatigue and speeding compliance;
- HML regulations;
- the IAP;
- Chain of Responsibility (CoR); and
- the National Heavy Vehicle Accreditation Scheme.

For the most part, the HVNL's position on these matters follows the NTC's earlier model laws. The significant differences are that the HVNL provides for the creation of the NHVR and as of October 2018, in relation to the CoR, the deemed liability approach was replaced with a duty of care approach (NHVR, 2018c). The duty of care approach is similar to that in other national safety laws and essentially requires each CoR party to ensure, as far as reasonably practicable, the safety of their transport activities relating to a heavy vehicle (NHVR, 2018c).

To date, Western Australia and the Northern Territory remain outside of the HVNL. Both states continue to operate their own legal regimes for any heavy vehicles entering their jurisdiction. Heavy vehicles, which leave Western Australia and Northern Territory, are however subject to the HVNL upon entry into HVNL participating jurisdictions.

In Western Australia, the relevant Acts governing heavy vehicles are the *Road Traffic (Vehicles) Act 2012* (Western Australia), the *Road Traffic (Vehicles) Regulations 2014* (Western Australia) and the *Occupational Safety and Health Act 1984* (Western Australia) (with respect to matters of heavy vehicle driver fatigue). In the Northern Territory, the operative Acts are the *Motor Vehicles Act* (Northern Territory), the *Motor Vehicles (Standards) Regulations* (Northern Territory), and the *Work Health and Safety (National Uniform Legislation) Act 2011* (Northern Territory) and associated regulations with respect to matters of heavy vehicle driver fatigue.

3.2 Industry challenges with the HVNL

At the time of its introduction, the HVNL was widely viewed as a significant improvement on the earlier fragmented regulatory system (ATA, 2014). It promised a single administering body and greater heavy vehicle safety and efficiency gains, welcomed by operators and peak industry bodies alike. The estimated benefits from the RIS indicated that the HVNL would likely generate benefits for industry and society more broadly.

However, the day-to-day implementation of reform is always challenging, particularly in areas such as trucking that involve multiple levels of government, complexity in funding and interact with everyday Australians. As a result, a number of key challenges have emerged in the operation of the HVNL and the NHVR. From an industry point of view, these challenges likely mean that the potential benefits of reform identified in the RIS have not been fully achieved.

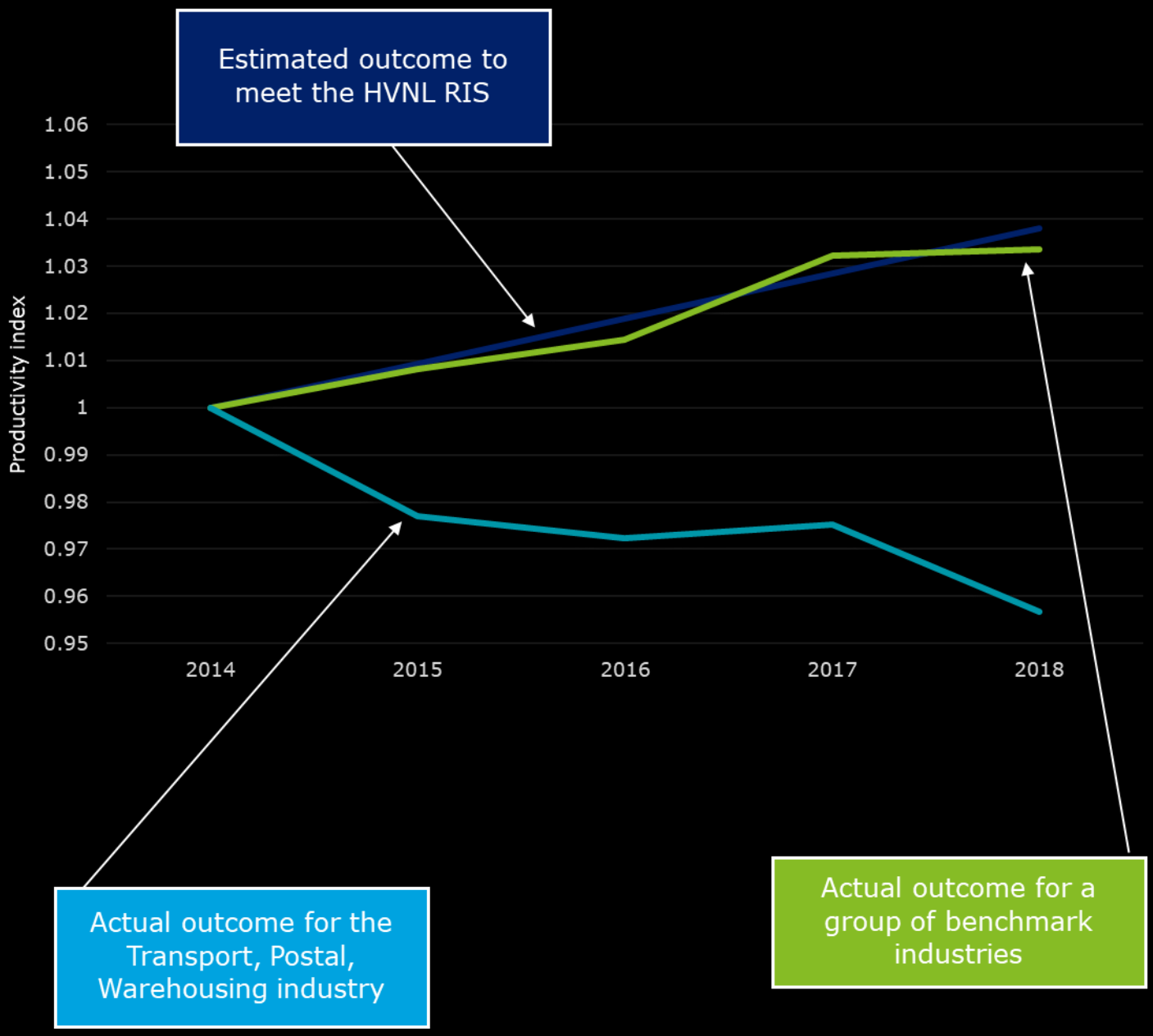
Although there are challenges that have been seen in the day-to-day implementation of the HVNL, there are three main areas that have been identified by industry as requiring immediate reconsideration: RAVs, HML and the IAP, and OSOM vehicles.

- **RAV:** The general view of industry and government is that the RAV permit process operates inconsistently across states and territories and that the productivity benefits expected in the 2011 RIS have not been achieved. Moreover, the permit process is not fully transparent, evidence-based and timely, with performance-based standards (PBS) vehicles experiencing particular difficulties in obtaining permits.

- **IAP and HML:** Despite the HVNL, the approach to using IAP as a condition for HML access continues to be inconsistent across states and territories and the application, itself, has been viewed by industry as operating too strictly.
- **OSOM vehicles:** The OSOM vehicle permit process is inconsistent across HVNL jurisdictions, with decisions often suffering significant delays. Pilot and escort vehicle training and accreditation requirements further continue to lack consistency across jurisdictions and result in additional administrative burden and delay.

Each of these areas is considered in further detail in Chapter 5.

The NHVR was anticipated to deliver significant productivity improvements for the trucking industry and the economy, but actual productivity outcomes suggest these improvements may not been realised…



Details about this modelling can be found in Chapter 6.

4 Policy challenges and opportunities

This Chapter focuses on three areas of the Heavy Vehicle National Law (HVNL) where regulations have either not kept pace with industry requirements or have not been implemented as intended – Restricted Access Vehicles (RAVs), the Intelligence Access Program (IAP) and Higher Mass Limits (HML) and Oversize Overmass (OSOM) vehicles.

4.1 Restricted Access Vehicles (RAVs)

4.1.1 About the current policy

A RAV is any heavy vehicle, which is required to have a permit or notice to operate on the HVNL road network.[7] In general, RAVs can be classified into one of three classes.

- **Class 1 heavy vehicles**, which are OSOM vehicles designed to serve a particular purpose. Such vehicles include special purpose vehicles, agricultural vehicles and vehicles designed to carry a large indivisible item.
- **Class 2 heavy vehicles**, which are not OSOM vehicles, but may nevertheless pose a risk to the public. Class 2 vehicles include B-doubles, road trains, buses longer than 12.5 metres and performance-based standards (PBS) vehicles.
- **Class 3 heavy vehicles**, which include all other OSOM vehicles that are not Class 1 vehicles.

The nature of the permit required differs depending on the class of heavy vehicle. Class 1 and Class 3 heavy vehicles are required to obtain a 'mass or dimension exemption' by Commonwealth Gazette notice or permit to operate on local roads,[8] while Class 2 vehicles are required to obtain a 'Class 2 heavy vehicle authorisation' by gazette notice or permit in order to operate.[9]

Gazette notices are available for certain classes of heavy vehicles on parts of the HVNL network. The *National class 1 special purpose vehicle notice 2016 (no. 1)*, for example, allows class 1 special purpose vehicles up to 40 tonnes on local roads that are listed within the notice. Gazette notices are publicly available on the National Heavy Vehicle Regulator's (NHVR's) website and can be used by all heavy vehicles that meet their requirements.[10] In contrast, obtaining a permit is a more involved process.

Currently, the process under the HVNL requires:

1. Persons[11] to apply to the NHVR for a Class 1, 2 or 3 permit.
2. The NHVR to liaise directly with all relevant 'road managers' (i.e. state/territory road authorities and local councils) to obtain road manager consent along the route applied for.
3. Road managers assessing whether or not to give consent, by reference to whether the proposed permit is likely to:
   a) cause damage to road infrastructure;

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[7] Chapter 4 of the HVNL sets out a series of mass, dimension and loading requirements for all vehicles having a gross vehicle mass (GVM) or aggregate trailer mass (ATM) of more than 4.5 tonnes ("heavy vehicles"). Any heavy vehicles, which meet the mass and dimensions requirements and are not "class 2 heavy vehicles", are considered "general access" or "as-of-right" vehicles. These vehicles are not required to have a notice or permit to operate on the HVNL road network. The counterpart to General Access Vehicles (GAVs) under the HVNL are RAVs. RAVs are heavy vehicles, which are required to have a notice or permit to operate on the HVNL road network.
[8] s153A of the *HVNL*.
[9] s137 of the *HVNL*.
[10] All national, state and territory notices can be accessed and printed off the NHVR website at https://www.nhvr.gov.au/law-policies/notices-and-permit-based-schemes. In most cases, drivers will not even need to carry a copy of the gazetted notice under which they are operating their heavy vehicle.
[11] For the purposes of the *HVNL*, a 'person' may also be a company.

b) impose adverse effects on the community;[12]
c) pose significant risks to public safety arising from heavy vehicle use that is incompatible with road infrastructure or traffic conditions; and
d) the possibility of granting the permit subject to conditions that will minimise that damage or public risk.[13]

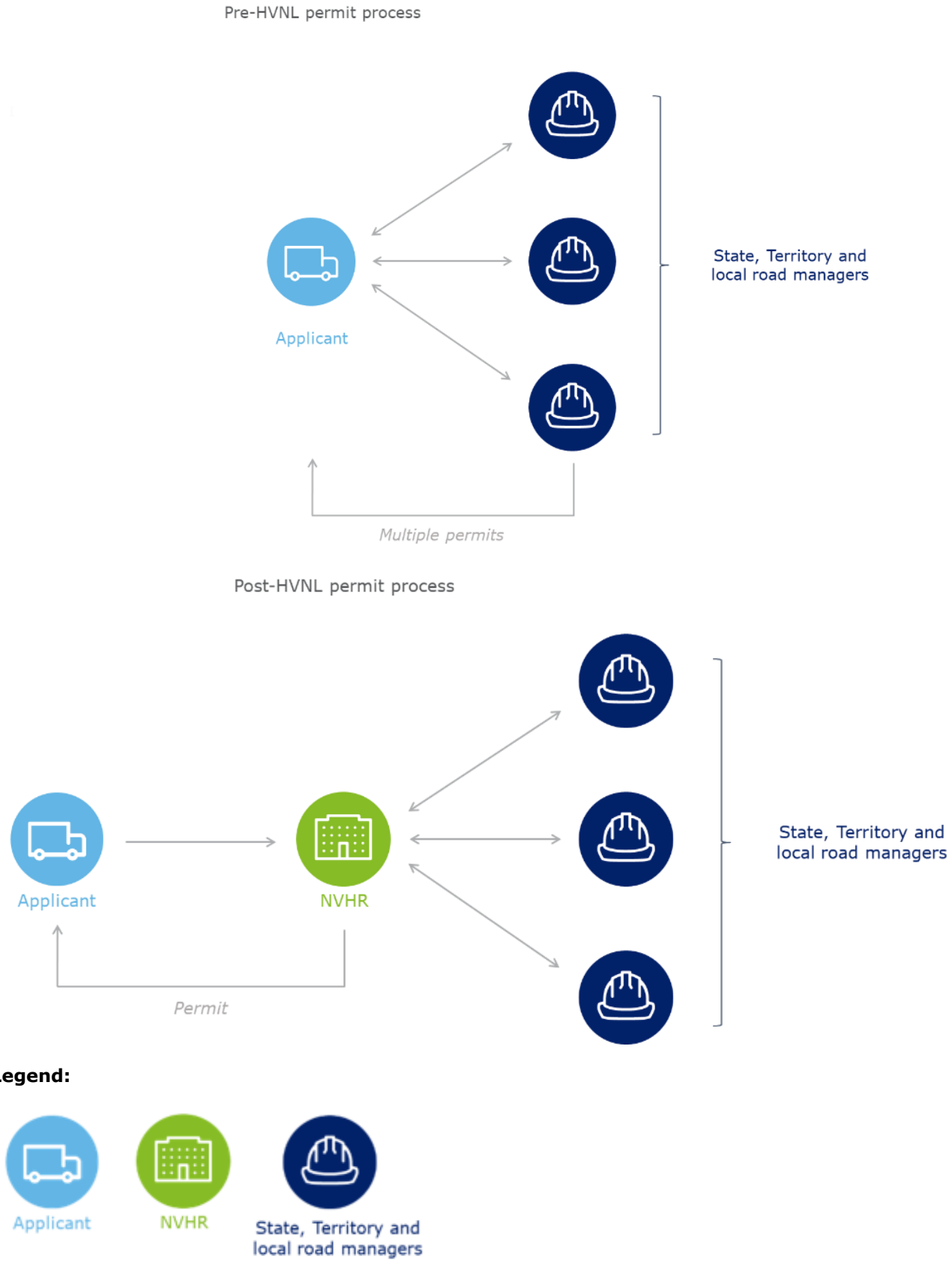
4. The NHVR to issue a permit, where all road managers give consent, or refuse a permit, where at least one road manager does not provide consent.

In certain circumstances, permit applicants may also need to consult and/or seek approvals from third-party entities outside of the HVNL. Applicants with OSOM vehicles, for example, may have to secure additional police escorts and/or approval from rail infrastructure managers and tollways operators on their routes after completing the HVNL permit process above.

Generally, however, the NHVR acts as the main body for issuing RAV permits under the HVNL. This replaces the earlier pre-HVNL approach of having operators apply to each state, territory and local authority for local road access under less formal processes (Queensland Audit Office, 2016). Figure 4.1 illustrates at a high-level the difference between the pre-HVNL RAV permit process and the HVNL process.

[12] Road managers are required to give consent decisions within a 28-day statutory timeframe (s156(1) of the *HVNL*). The HVNL does not include any provisions regarding what should happen in circumstances where the road manager does not meet this timeframe.
[13] s156(2) of the *HVNL*.

Figure 4.1: RAV permit process pre- and post-HVNL



Source: Adapted from the Queensland Audit Office's *Heavy vehicle road access reforms* (2016) report.

As the 2011 Regulatory Impact Statement (RIS) sets out, the rationale of the HVNL process is to streamline and reduce the time and cost associated with obtaining RAV permits. The productivity benefits of this more efficient process were estimated to be between $3.1 and $7.0 billion in net present value (NPV) terms over 20 years. This represented the majority of the $5.6 to $12.4 billion in benefits estimated for the HVNL in the 2011 RIS.

Table 4.1: RAV benefits estimated in 2011 RIS

Economic benefits	Economic benefits sub-category	Pessimistic scenario ($ m)	Best bet scenario ($ m)
Savings	- Compliance cost (on industry)	378	840
	- Enforcement administration cost (on regulators)	94	210
Safety		63	140
Environment	- Noise	31	70
	- CO_2 emissions	63	140
Productivity		2,518	5,700
Total		**3,148**	**7,000**

Note: The best bet scenario assumes the replacement of the pre-HVNL regulatory system with a single national approach to regulation, while the pessimistic scenario assumes that the pre-HVNL regulatory system is addressed by legal reconciliations between all the states and territories' heavy vehicle Acts.
Source: Adapted from the National Transport Commission's HVNL RIS (2011).

4.1.2 Challenges with the current policy

Both government and industry have identified three recurrent issues with how the HVNL RAV permit process works in practice.

The first issue is that **the RAV permit process is not streamlined and is inconsistent across participating HVNL states and territories**. It was always intended that the NHVR would be the primary RAV permit processing body under the HVNL. However, in practice the NHVR shares this responsibility with other state and territory road authorities under a delegation arrangement. This arrangement of sharing processing responsibility initially arose out of issues in the NHVR's online application processing system. These issues continue to persist today (Queensland Audit Office, 2016).

Across the various HVNL jurisdictions, the Australian Capital Territory's Roads ACT and the South Australian Department of Planning, Transport and Infrastructure only recently transferred their permit processing responsibilities back to the NHVR on 28 August 2017 (NHVR, 2017a) and 4 December 2017 (South Australia Government, 2017), respectively under the NHVR's Delegations Project. VicRoads transferred its Class 1 permit processing responsibilities back to the NHVR on 28 May 2018 (NHVR, 2018f), and the Tasmanian Department of State Growth followed shortly after on the 2 July 2018 (Department of State Growth, 2018). In NSW and Queensland, however, a number of permit classes still continue to be processed by the state and local road agencies.

Table 4.2 shows the classes of RAV permits processed and not processed by the NHVR under the current delegation arrangement. While the situation continues to improve, as recently as 2016-17 state and territory road authorities continued to process the majority of RAV permits (42,263 applications) compared to the NHVR (23,335 applications) (NHVR, 2017b).

This means that issues of duplication and administrative burden continue to persist for operators with certain classes of RAVs involved in interstate journeys as some state and territory authorities

are responsible for issuing certain classes of RAV permits and the NHVR responsible for others (Queensland Audit Office, 2016).

Table 4.2: Permits processed by the NHVR

	Class 1 permit	Class 2 permit	Class 3 permit	HML permit
Interstate journeys	✓	✓	✓	✓
Journeys within NSW	Still processed by NSW RMS	✓	Still processed by NSW RMS	✓
Journeys within Victoria	✓	✓	✓	✓
Journeys within Queensland	Still processed by QLD DTMR	✓	✓	✓
Journeys within SA	✓	✓	✓	✓
Journeys within Tasmania	✓	✓	✓	✓
Journeys within ACT	✓	✓	✓	✓

Note: NSW RMS denotes NSW Road and Maritime Services and QLD DMTR denotes Queensland Department of Transport and Main Roads. In NSW, individuals can apply for Class 1 and Class 3 permits through NSW RMS and local councils or apply through the NHVR.
Source: Adapted from the Queensland Audit Office's *Heavy vehicle road access reforms* (2016) report, with updates according to https://www.nhvr.gov.au/road-access/access-management/delegations-project.

The second issue that has arisen with RAV regulation is the **transparency and timeliness of RAV permit decisions**. Under the current process, state, territory and local road authorities are required to make road manager consent decisions based on whether there is evidence of a risk to road infrastructure or the public. Local councils, however, often do not have the resources and expertise readily available to make a timely and technical assessment of the relevant risks to road infrastructure (Queensland Audit Office, 2016) (Austroads, 2018). According to the Queensland Audit Office (2016), consent decisions from local road managers tend to lack evidence of road infrastructure risks based on industry experience.

Moreover, the perception from industry is that processing times have increased since the introduction of the HVNL decision-making framework (ATA, 2018). The Queensland Trucking Association (QTA) has estimated that delays in processing time represent 4.5 million days lost each year in waiting for permit decisions (ATA, 2018).[14]

The overall processing time has decreased significantly in recent years. In 2017-18, the overall average end-to-end processing time was19 days (NHVR, 2018a), compared to 2016-17, where the overall processing time on all RAV permit applications received by the NHVR was approximately 34 days (NHVR, 2017b). Table 4.3 and Figure 4.2 summarises the overall processing time and average time taken by local road managers, state/territory road managers and the NHVR on RAV permit applications.

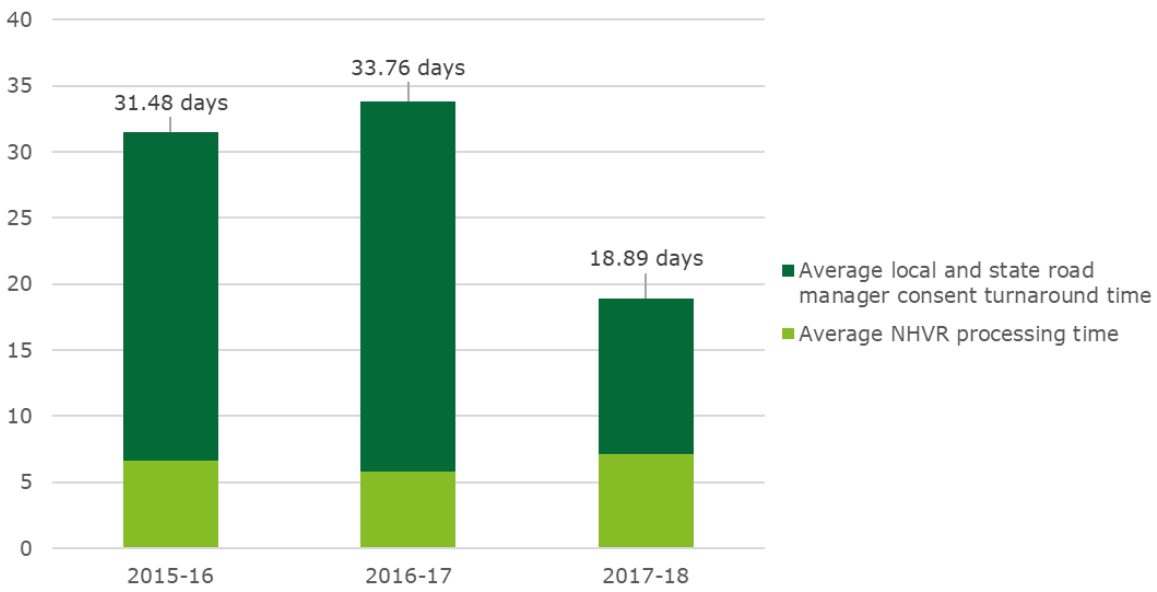
[14] The QTA's calculation assumes that 20,000 permits are issued by each jurisdiction and the NHVR each year, before rounding that estimate down in light of the smaller jurisdictions and multiplying by the 30-day approval process. See: ATA (2018).

Table 4.3: Average processing times (in days) for applications received by the NHVR

	2015-16	2016-17	2017-18
Total applications received	**22,824**	**23,335**	**33,365**
Average end-to-end time	**31.48**	**33.76**	**18.89**
- NHVR processing time	6.59	5.78	7.11
- Average time for local road manager consent (when within 28 days)	7.61	7.9	5.2
- Average time for state road manager consent (when within 28 days)	11.33	8.55	4.37
- Average time for local road manager consent (when outside 28 days)	57.74	67.59	60.23
- Average time for state road manager consent (when outside 28 days)	67.58	75.21	66.83

Source: Adapted from NHVR Annual Report (2018a).

Figure 4.2: Average end-to-end processing times for applications received by the NHVR



Source: Deloitte Access Economics.

The third issue with the regulation of RAVs concerns **performance-based standard (PBS) vehicles, which face particular difficulties in obtaining RAV permits under the HVNL**.

PBS vehicles (otherwise known as high productivity freight vehicles) are heavy vehicles that have been modified in design to improve their productivity on a given freight task. The PBS scheme in Chapter 1 of the HVNL sets out the approval process for proposed PBS vehicle designs and how final PBS vehicle access permits may be obtained.

While PBS vehicles offer potential productivity gains and must meet stringent safety standards to be approved, road managers generally have not given adequate access to PBS vehicles in line with the National Transport Commission's (NTC's) national PBS Network Classification Guidelines (Austroads, 2018). As set out in Table 4.4, these Guidelines recommend varying levels of access for HVNL states and territories to adopt in relation to different PBS vehicle classes.

Table 4.4: The NTC's PBS Network Classification guidelines

PBS class	Equivalent prescriptive vehicle configuration	Recommended network access
PBS Level 1	19 metre prime mover and semitrailer	General Access
PBS Level 2	26 metre B-double	26 metre B-double network
PBS Level 3	36.5 metre Type I road train	36.5 metre Type I road train network
PBS Level 4	53.5 metre Type II road train	53.5 metre Type II road train network

Source: NHVR (2018e) *Performance Based Standards: A guide for road managers*.

Queensland and Victoria are the only states to adopt the recommended general access for PBS Level 1 vehicles, although both states still require the submission of individual permit applications (Austroads, 2018).

At the local council level, the industry experience has been that limited road manager resources and technical PBS expertise have contributed to even greater delays and resistance to the granting of RAV permits to PBS vehicles (National Transport Commission, 2018a). Data from the NHVR suggests that operators of PBS vehicles wait at least seven weeks to obtain a permit (National Transport Commission, 2018a). This is compared to the overall end-to-end processing times for RAV permits outlined in Table 4.3 above of around 19 days or two and a half weeks in 2017-18.

This approach at all road manager levels encourages the use of more vehicles to meet Australia's freight task (National Transport Commission, 2018a). With more vehicles, this can result in an increase in the negatives associated with freight such as congestion, noise and emissions. It additionally passes up on many potential productivity gains from using PBS vehicles (National Transport Commission, 2018a). The benefits of using PBS vehicles over other prescriptive vehicles were most recently estimated by the NTC (2017) to be $65 million in savings to road maintenance expenses and between 15-30% in freight productivity gains.

Insofar as each of these issues represent a deviation from the intended RAV permit framework envisaged in the 2011 RIS, the current RAV permit process cannot be said to be generating the $20.1 billion worth of productivity gains estimated in that report.

4.2 The Intelligent Access Program (IAP) and Higher Mass Limits (HML)

4.2.1 About the current policy

The IAP is a regulatory telematics application that utilises satellite tracking and wireless communication technology to monitor where, when and how heavy vehicles are operating on the HVNL road network. Like a number of other applications within the National Telematics Framework,[15] the IAP is designed to ensure that the "right truck is on the right road, at the right time" (Transport Certification Australia, 2016).

The IAP works differently from state-to-state. In general, however, operators and drivers who opt-in to the IAP are offered incentives in exchange for complying with programmed route and access conditions. Compliance with the IAP in particular is a typical requirement for accessing additional mass entitlements under the HVNL known as HML – which means the truck can operate with more tonnes.

The IAP is highly accurate, with non-compliance reports being generated whenever a heavy vehicle deviates from its programmed route or access conditions. It provides such high levels of

[15] The National Telematics Framework is a digital business platform, which supports the use of telematics and related intelligent technology providers in the regulation of vehicles. Transport Certification Australia is the national government body responsible for the management of the National Telematics Framework.

assurance[16] (Level 3 assurance) that the IAP data reports can be adduced as *prima facie* evidence in court proceedings (Transport Certification Australia, 2018a).

While it was intended that the HVNL would harmonise the IAP requirements across participating states and territories, the HVNL has not yet been able to achieve that harmonisation. The 2011 RIS valued the benefits of adopting a single national approach to the IAP under the HVNL at between $519 and $1,156 million – the primary benefits lying in productivity gains from greater RAV and HML access (Centre for International Economics, 2011).

Table 4.5: IAP benefits estimated in the 2011 RIS

Economic benefits	Economic benefits sub-category	Pessimistic scenario ($ m)	Best bet scenario ($ m)
Savings	- Compliance cost (on industry)	62	139
	- Enforcement administration cost (on regulators)	16	35
Safety		10	23
Environment	- Noise	5	12
	- CO_2 emissions	10	23
Productivity		416	924
Total		**519**	**1,156**

Note: The best bet scenario assumes the replacement of the pre-HVNL regulatory system with a single national approach to regulation, while the pessimistic scenario assumes that the pre-HVNL regulatory system is addressed by legal reconciliations between all the states and territories' heavy vehicle Acts.
Source: Adapted from the National Transport Commission's HVNL RIS (2011).

4.2.2 Challenges with the current policy

The current operation of the IAP within the HVNL has presented three main problems.

First, like the RAV permit process, the **use of IAP as a condition for HML access is not consistent and varies across different HVNL jurisdictions**. For example, in NSW and Queensland, compliance is a necessary requirement for obtaining HML access (NHVR, 2017c). In South Australia, the IAP is voluntary and an alternative to attaining National Heavy Vehicle Accreditation for HML access (NHVR, 2017c). In Victoria, Tasmania and the ACT, there is no requirement to enrol in the IAP to obtain HML access (NHVR, 2017c).

An implication of the inconsistent approach across states is that operators and drivers of HML vehicles cannot freely cross from one HVNL jurisdiction into another, unless they comply with the strictest jurisdiction imposing the IAP for HML. Operators and drivers, therefore face a "highest common denominator" approach to compliance, with increased administrative burden and costs (National Transport Commission, 2011). This can, in turn, discourage HML take-up and cause the economy to miss further productivity gains associated with the use of HML vehicles (i.e. larger and fewer heavy vehicle movements) (National Transport Commission, 2011).

Second, there is a view that the **IAP is too precise and stringent for its intended purpose**. For example, industry experience is that even the most minor of deviations from route or access conditions – such as a petrol stop – can generate a non-compliance report to road authorities. Any reports generated are not accompanied with a notice to the relevant IAP user. As such, operators and drivers are unable to address their non-compliance as it occurs (Transport Certification Australia, 2018a). The NHVR and Transport Certification Australia (the national government body

[16] The IAP is currently set to the highest level of assurance – Level 3 Assurance. This compares to the lowest, Level 1 Assurance, which is primarily used in "advisory" telematics applications not required to have a high level of data accuracy or integrity, and the medium Level 2 Assurance, which applies a reasonable amount of rigour in the collection and reporting of telematics data. See: Transport Certification Australia (2018b).

responsible for managing IAP and other applications in the National Telematics Framework) – have supported these views (Transport Certification Australia, 2018a).

This problem has been exacerbated by ongoing scope creep in the application of the IAP by some local road managers for road asset management and planning purposes. In addition to route and access conditions, local road managers have imposed further digital conditions to track the use of road infrastructure and better understand traffic congestion on local roads (Transport Certification Australia, 2018a). This can in turn lead to significant distortions in the operation of the IAP and a greater number of non-compliance reports being generated than what should otherwise be the case. Additional data processing by IAP service providers further adds to increased costs for operators using the IAP (Transport Certification Australia, 2018a).

Finally, the **costs of operating the IAP continue to be substantial for operators**, especially when there are few productivity benefits. Operators currently face significant charges of up to $250 per month for each IAP unit they install into a heavy vehicle in their fleet (National Transport Commission, 2018b). As the NTC (2018b) notes, much of this is due to service providers incurring significant start-up costs to develop Transport Certification Australia-certified IAP solutions. On average, service providers spend between $0.5 to $2 million to develop an IAP solution and obtain Transport Certification Australia certification before they are able to charge client operators (National Transport Commission, 2018b).

With its high costs and limited benefits,[17] there has been an industry-wide reluctance to enrol in the IAP. As of March 2018, there are 98,108 articulated heavy vehicles across Australia, but only 4,374 vehicles enrolled in IAP (National Transport Commission, 2018b). That is, only 4.5% of the heavy vehicle fleet in Australia has taken-up the IAP. Insofar as this inhibits HML access, the economy may be missing out on significant productivity gains from having fewer heavy vehicles on the road network carrying larger freights.

Given that the HVNL has not been able to achieve harmonisation in IAP requirements and the presence of the above issues, IAP under the HVNL appears to be far from achieving the economic benefits estimated by the 2011 RIS.

4.3 Oversize and Overmass (OSOM) vehicles

4.3.1 About the current policy

OSOM vehicles are heavy vehicles that do not comply with the mass or dimension requirements set out in Chapter 4 of the HVNL. There are two classes of OSOM vehicles.

- **Class 1 heavy vehicles**: OSOM vehicles designed to serve a particular purpose. Such vehicles include special purpose vehicles, agricultural vehicles and vehicles designed to carry a large indivisible item.[18]
- **Class 3 heavy vehicles**: all other OSOM vehicles that are not Class 1 vehicles.

Both classes are required to obtain a 'mass or dimension exemption' by notice or permit to operate on the HVNL road network, which operates in the same way as RAV permits, as described in Sub-Section 4.1.1. Given the special nature of OSOM vehicles and the loads they carry, the HVNL allows a relatively wide range of additional conditions to be attached to mass and dimension exemptions.[19] Examples of additional conditions include route conditions, travel conditions, and even, requirements to comply with the IAP or to carry a copy of the vehicle's mass or dimension exemption.

[17] The issues noted earlier (i.e. the inconsistent approach to IAP across HVNL states and territories, the lack of transparency around non-compliance reports for operators and drivers and the unduly strict operation of IAP generating false positive non-compliance reports) have contributed to there being few productivity benefits for operators enrolling in IAP.
[18] s116(1) of the *HVNL*.
[19] As compared to Class 2 heavy vehicle authorisations. See: s119, s125, s140 and s146 of the HVNL.

One of the most common conditions is to require a pilot vehicle[20] or an escort vehicle[21] to accompany the OSOM vehicle while it is being operated on the road. This is typical in cases, where the OSOM vehicle is a Class 1 heavy vehicle carrying a large, indivisible item such as a wind turbine.

The 2011 RIS sets out that the HVNL approach to OSOM vehicles is intended to be uniform and nationally consistent. Prior to the HVNL, conditions on mass and dimension exemptions varied widely across jurisdictions, as did pilot and escort requirements, generating significant administrative burden and costs on operators. The benefits of having a single, nationally consistent approach to OSOM vehicles were estimated in the RIS to range between $134 and $298 million over a 20-year period from 2011 to 2030. The majority of those benefits laid in $107 to $238 million in productivity gains from greater access being given to higher-productivity OSOM vehicles (especially, special purpose vehicles) and a more streamlined approach to OSOM permits (Centre for International Economics, 2011).

Table 4.6: OSOM benefits estimated in 2011 RIS

Economic benefits	Economic benefits sub-category	Pessimistic scenario ($ m)	Best bet scenario ($ m)
Savings	- Compliance cost (on industry)	19	42
	- Enforcement administration cost (on regulators)	5	11
Safety		3	7
Environment	- Noise		
	- CO_2 emissions		
Productivity		107	238
Total		**134**	**298**

Note: The best bet scenario assumes the replacement of the pre-HVNL regulatory system with a single national approach to regulation, while the pessimistic scenario assumes that the pre-HVNL regulatory system is addressed by legal reconciliations between all the states and territories' heavy vehicle Acts.
Source: Adapted from the National Transport Commission's HVNL RIS (2011).

4.3.2 Challenges with the current policy

There are two main issues with OSOM vehicles under the HVNL.

First, **the permit process for OSOM vehicles is inconsistent** across HVNL jurisdictions, with decisions lacking timeliness and transparency.

Given that OSOM vehicles are a subset of RAVs, the issues regarding timeliness and transparency discussed in Section 4.1 in the context of RAVs are similarly applicable to OSOM vehicles. However, OSOM vehicles have experienced some particular difficulties in obtaining timely and transparent permit decisions.

In addition to requiring consent from local road managers, with few resources and limited technical OSOM knowledge, permits for OSOM vehicles generally require pilot/escort vehicle approvals, utility clearances, bridge assessments and rail crossing approvals. An implication of these many procedural requirements is that OSOM vehicle permits tend to face very significant delays, particularly in instances where the relevant bodies have not coordinated with each other or there has been no mechanism to facilitate this coordination (WSP, 2018). The ATA (2018) has, for example, reported that it can take more than 80 days to get a permit to transport OSOM steel products on tollways in Melbourne – much of the delay due to the various approval processes not

[20] A pilot vehicle refers to any vehicle, which accompanies an oversize vehicle for the purpose of warning other road users of the oversize vehicle's presence (s5 of the HVNL).
[21] An escort vehicle is a vehicle operated by a "police officer or a person authorised to direct traffic under an Australian road law" (otherwise known as a "warden") (s5 of the HVNL).

working in parallel. For many operators, this can translate into significant economic loss, with payouts under penalty clauses and lost business.

The second issue for OSOM vehicles is that although much of the law regarding OSOM vehicles has been unified by the HVNL, **pilot and escort training and accreditation requirements continue to differ across HVNL jurisdictions**. In Queensland, for example, pilot drivers are required to have successfully passed Pilot Vehicle Driver Level 1, while escort drivers are required to have passed both Pilot Vehicle Driver Level 1 and Level 2 Escort Vehicle driver (Queensland Department of Transport and Main Roads, n.d.). In South Australia, there are no requirements for becoming a pilot driver and only police can operate escort vehicles (National Transport Commission, 2014). These different requirements can cause inefficiencies for operators moving oversized loads in different HVNL jurisdictions and further limit the labour mobility of pilot and escort drivers (National Transport Commission, 2014).

To the extent that these issues can be considered deviations from the HVNL OSOM framework set out in the RIS 2011, the current OSOM framework appears to be falling short of the benefits estimated in that report.

Case study: Challenges with OSOM

Obtaining an OSOM permit can be a long and complex process under the HVNL. In addition to the usual delays and lack of transparency surrounding RAV permits more generally, there can be extra road conditions attached to OSOM permits requiring further consultation and approvals from various third-party entities. These can range from pilot/escort vehicle approvals to utility clearances and rail crossing approvals.

A trucking operator based in Queensland has outlined some of the challenges that they face based on their experience in obtaining OSOM permits.

In their view, the process can be time consuming with regards to:

- scoping and assessing the route
- filing an initial application to the Queensland Department of Transport and Main Roads
- seeking approvals from a range of utilities and rail operators including Ergon, Energex, Optus, Aurizon, Essential Energy and Queensland Rail
- organising an escort vehicle with the Queensland Police and
- calling and emailing all contacts listed under road conditions attached to an OSOM permit, which can range from 2 to up to 15 contacts, depending on the route.

The operator provided an example of a route it regularly travels and where every item being moved requires its own individual permit and that each permit is considered individually on each application. This requires, for each application, communication with road managers/owners each time, despite the same items travelling to the same route at different periods in the week, month or year.

In another example, they noted that even if they had a permit for a heavier load already approved for a particular route, even for a lighter load, on the same route, a week later, they would need to apply for another permit. In this respect, the operator questioned whether there could be a pre-approval process for certain dimensions and mass.

This permit process can have flow-on effects for both their business and their client's business. The operator noted that they regularly collect items from the wharf. The uncertainty in timing related to boat schedules, with continual revised arrivals dates, means they often won't have clarify over the arrival of the boat until at least two weeks out. This presents an issue for some movements off the wharf due to the permit process taking longer than two weeks, in many instances. In the absence of being able to acquire the permit, they are unable to move the item from the wharf, meaning that the client either goes to another operator or the client paying for storage until the OSOM permit is obtained.

5 Policy suggestions

This Chapter considers a range of policy suggestions to address the challenges identified earlier for Restricted Access Vehicles (RAVs), the Intelligent Access Program (IAP) and Higher Mass Limits (HML), and oversize overmass (OSOM) vehicles.

The policy suggestions proposed here are broken down into two categories. The first category consists of suggestions that directly deal with the current system of regulation. These incremental suggestions address issues in the existing regulatory framework and could be pursued today. The second category of proposed suggestions are a more substantial policy changes that take advantage of modern technologies available in the trucking industry. While this more substantial changes would take some time to develop, the presence of a range of similar, existing technologies suggests that, with sufficient investment, implementation could be possible in the near future.

5.1 Incremental policy suggestions

Many of the challenges identified in Section 4 overlap across the three areas of RAVs, the IAP and HML, and OSOM vehicles.

The IAP, for example, is inconsistently imposed as a condition of HML access across HVNL jurisdictions, much like OSOM pilot and escort training and accreditation requirements. The lack of a national position in the HVNL on these matters has largely contributed to this state of affairs.

Similarly, permit processes for RAVs and OSOM vehicles share common issues with timeliness and transparency, partly due to the involvement of different road managers and external bodies with limited resources and technical knowledge.

Potential incremental policy suggestions for the HVNL are separated into four key themes.

1. Promoting national consistency and certainty in heavy vehicle regulation.
2. Improving communication and coordination between the NHVR, road managers and external bodies.
3. Implementing the most technologically-advanced and cost-efficient regulatory solution possible.
4. Recognising that road managers, as road asset owners, should have influence over access to their road network and need to be appropriately compensated for use of that network.

The policy suggestions in this section are a mix between targeted actions and areas for further investigation and research. The policies contained within this Chapter are suggestions and not recommendations. Before adoption of any such policy, it will be necessary for decision makers to undertake due diligence including the appropriate regulatory impact analyses.

Table 5.1: Summary of incremental policy suggestions

Key theme or principle	Area of policy being addressed	Policy suggestions
Promoting national consistency and certainty in heavy vehicle regulation	All	**1:** Support and implement, where appropriate, the findings of the Review of the HVNL with a view to promoting greater national consistency and uniformity, particularly in the areas of IAP being a condition for HML access and OSOM pilot and escort vehicle training and accreditation requirements.
	RAVs, OSOM vehicles	**2:** Conclude the NVHR's interim delegation arrangements with states and territories.
	RAVs, OSOM vehicles	**3:** Amend the HVNL such that there is: • a *maximum* time period within which road managers must decide consent (subject to exceptions) (in section 156 of the HVNL); and • a legislative balancing exercise requiring road managers to consider both the *benefits* and *costs* of giving consent (in section 156A of the HVNL).
	RAVs, OSOM vehicles	**4:** Mandate the use of the NHVR's *Approved Guidelines for Granting Access* by all HVNL road managers.
	RAVs, OSOM vehicles	**5:** Consider the need for, and costs and benefits associated with, implementing an external, independent review process (e.g. through a tribunal) for access decisions.
Improving communication and coordination between the NHVR, road managers and external bodies	RAVs, OSOM vehicles	**6:** Increase staffing for training and education programs targeted at local road managers regarding RAV permit processes (particularly in the use of the NHVR's *Approved Guidelines for Granting Access*).
	RAVs, OSOM vehicles	**7:** Update the evidence base around the costs and benefits of high productivity freight vehicles (HPFVs) and ensure this updated evidence is communicated effectively to road managers.
	RAVs, OSOM vehicles	**8:** Introduce case managers and liaison officers into the RAV and OSOM permit process with the aim of facilitating greater communication and coordination between RAV permit processes and external processes (such as pilot/escort vehicle approvals, utility clearances, bridge assessments and rail crossing approvals).
	OSOM	**9:** Encourage, where reasonable, the use of industry pilot vehicles or traffic warden-operated escort vehicles over police escort vehicles for OSOM vehicles.
Implementing the most technologically-advanced and cost-efficient regulatory solution possible	RAVs, OSOM vehicles	**10:** Adopt the ARRB's RAVRAT at all road manager levels (state, territory and local) in the assessment of whether or not to provide consent for a RAV permit (under section 156 of the HVNL).
	IAP	**11:** Adjust the operational rules of the IAP to reduce the number of false positive non-compliance reports and support the sharing of non-compliance reports with operators and drivers, and provide non-compliance reports and alerts of safety and infrastructure risks in real-time.
	IAP	**12:** Prevent road manager use of the IAP for purposes other than heavy vehicle access and compliance management. In turn, make available new low-cost, low-assurance telematics applications to road managers to address their needs in relation to road asset management and planning.
	IAP	**13:** Investigate other regulatory telematics applications as possible low-cost alternatives to IAP for heavy vehicle access and compliance management.
	RAV, OSOM vehicles	**14:** Consider technology-based solutions to align and coordinate the RAV permit processes and other external processes (such as pilot/escort vehicle approvals, utility clearances, bridge assessments and rail crossing approvals).
Road managers need to have influence over access to their road network and need to be appropriately compensated	RAVs, OSOM vehicles	**15:** In line with the HVRR, a funding arrangement should be established, in which road managers receive a percentage of access permit fees received by the NHVR in return for processing applications in a timely manner. In cases where road manager consent is untimely, the fee should be returned to the applicant.
	OSOM	**16:** In line with the HVRR, a special project permit should be introduced for OSOM vehicles, in which a higher fee is charged for the ability of the applicant to determine a date when a final permit decision must be made. This additional fee would be subject to a refund if road manager consent is untimely.

5.1.1 Promoting national consistency and certainty in heavy vehicle regulation

As noted earlier, both the HVNL and the NHVR appear to have departed significantly from how they were originally intended to operate. The HVNL, rather than providing a single, nationally consistent set of laws for all heavy vehicles, currently allows states and territories to adopt different positions on a number of heavy vehicle matters. The NHVR, on the other hand, is far from a 'one stop shop' for all RAV permit applications (including OSOM permits), having delegated some of its permit processing responsibilities to other state and territory road managers. Accordingly, our first set of policy suggestions aims to address these issues by promoting national consistency and certainty in heavy vehicle regulation.

Policy suggestions: Promoting national consistency and certainty in heavy vehicle regulation

1: Support and implement, where appropriate, the findings of the Review of the HVNL with a view to promoting greater national consistency and uniformity, particularly in the areas of IAP being a condition for HML access and OSOM pilot and escort vehicle training and accreditation requirements.

2: Conclude the NVHR's interim delegation arrangements with states and territories and, as originally intended, re-instate the NVHR as the 'one stop shop' for all permit applications.

3: Amend the HVNL such that there is:

- a *maximum* time period within which road managers must decide consent (subject to exceptions) (in section 156 of the HVNL); and
- a legislative balancing exercise requiring road managers to consider both the *benefits* and *costs* of giving consent (in section 156A of the HVNL).

4: Mandate the use of the NHVR's *Approved Guidelines for Granting Access* by all HVNL road managers.

5: Consider the need for, and costs and benefits associated with, implementing an external, independent review process (e.g. through a tribunal) for access decisions

These policy suggestions may be pursued independently of each other. Together, however, their collective implementation would form a strong top-down approach for bringing back the HVNL and NHVR to their intended operation.

The first and second policy suggestions have already formed the subject of the NHVR's National Harmonisation program[22] (2018d) and Delegations Project (2018b) and the NTC's *Harmonisation of Pilot and Escort Vehicle Driver Requirements – National Accreditation Scheme Discussion Paper* (2014).

The third and fourth policy suggestions have found support in the WSP's *Review of Oversize Overmass (OSOM) Access Arrangements* (2018) and National Transport Commission's *Reforming the Performance-Based Standards scheme* (2018a) policy paper respectively.

5.1.2 Improving communication and coordination between the NHVR, road managers and external bodies

Re-prioritising national consistency and certainty in the operation of the HVNL and the NHVR at a high-level, however, is not enough. Greater coordination and communication between the NHVR, road managers and external bodies is also required for implementation of those objectives. Our second set of policy suggestions accordingly focus on fostering greater communication and coordination between all those bodies.

[22] Particularly with the NHVR's National HML Declaration.

Policy suggestions: Improving communication and coordination between the NHVR, road managers and external bodies

6: Increase staffing for training and education programs targeted at local road managers regarding, RAV permit processes (particularly in the use of the NHVR's *Approved Guidelines for Granting Access*).

7: Update the evidence base around the costs and benefits of high productivity freight vehicles (HPFVs) and ensure this updated evidence is communicated effectively to road managers.

8: Introduce case managers and liaison officers into the RAV and OSOM permit process with the aim of facilitating greater communication and coordination between RAV permit processes and external processes (such as pilot/escort vehicle approvals, utility clearances, bridge assessments and rail crossing approvals).

9: Encourage, where reasonable, the use of industry pilot vehicles or traffic warden-operated escort vehicles over police escort vehicles for OSOM vehicles.

Communication and coordination between the NHVR and road managers

To the extent that the NHVR continues to delegate permit processing to local road managers, training and education programs about RAV permit processes will assist in promoting greater consistency and transparency across all RAV permit decisions. Further, to the extent that local road managers were to make use of the Australian Road Research Board's (ARRB's) Restricted Access Vehicle Route Assessment Tool (RAVRAT) (see policy suggestions in Section 5.2) combined with an updated evidence base on the costs and benefits of using HPFVs, this could provide industry with increased operational certainty and improved access. In assessing the merit of any additional education and training programs, consideration should be given to who will run the programs and bear the associated costs.

Communication and coordination between the NHVR, road managers and external bodies

The introduction of case managers and liaison officers into the RAV approval process should further help to increase communication and coordination between all parties. Insofar as this increases the timeliness of permit decisions, there could be a significant reduction in costs for operators and productivity gains for industry.

The benefits of the fifth and sixth policy suggestions were recently highlighted in the NTC's (2018a) *Reforming the Performance-Based Standards scheme Policy paper*, while the seventh policy suggestion was also recommended in the WSP's *Review of Oversize Overmass (OSOM) Access Arrangements* (2018).

Finally, the use of industry pilot vehicles or at least, traffic warden-operated escort vehicles for OSOM vehicles could also be encouraged over police escort vehicles. While this policy suggestion does not necessarily improve communication and coordination between bodies involved in the OSOM permit process, it does limit the involvement of external bodies in the process and the long waiting times associated with coordinating with them.

5.1.3 Implementing the most technologically-advanced and cost-efficient regulatory solution possible

Alongside greater communication and coordination, the use of cost-efficient technology offers a path to improved regulatory experience for the trucking industry. To this end, our third set of policy suggestions encourages the adoption of new technologies and enhancements to existing regulatory technologies to bring about greater consistency and productivity in permit decision-making.

Policy suggestions: Implementing the most technologically-advanced and cost-efficient regulatory solution possible

10: Adopt the ARRB's RAVRAT at all road manager levels (state, territory and local) in the assessment of whether or not to provide consent for a RAV permit (under section 156 of the HVNL).

11: Adjust the operational rules of the IAP to reduce the number of false positive non-compliance reports and support the sharing of non-compliance reports with operators and drivers, and provide non-compliance reports and alerts of safety and infrastructure risks in real-time.

12: Prevent road manager use of the IAP for purposes other than heavy vehicle access and compliance management. In turn, make available new low-cost, low-assurance telematics applications to road managers to address their needs in relation to road asset management and planning.

13: Investigate other regulatory telematics applications as possible low-cost alternatives to IAP for heavy vehicle access and compliance management.

14: Consider technology-based solutions to align and coordinate the RAV permit processes and other external processes (such as pilot/escort vehicle approvals, utility clearances, bridge assessments and rail crossing approvals).

The potential policy suggestions include the adoption of the ARRB's RAVRAT by all road managers, changes to the operation of the IAP and the broader consideration of other technology-based solutions.

The RAVRAT, which is currently free for all local governments to use, is an online tool capable of performing route assessments for all RAVs, including PBS and OSOM vehicles. Data and guidelines may be uploaded to the program to produce timely road manager consent decisions that are consistent, transparent and evidence-based. With such a tool in place, the industry could benefit significantly from reduced waiting times and increased operational certainty.

With respect to the IAP, adjustments to the operational rules and preventing its misuse may further reduce the number of false positive non-compliance reports generated, avoiding the costs associated with addressing such reports. This, in turn, may encourage greater up-take of the IAP by operators and drivers and increase the amount of vehicles with HML access. Most recently, the NTC (2018b) and TCA (2018a) expressed support for this approach.

More broadly, other technology-based solutions need to be considered, particularly in the areas of the IAP and the coordination of RAV permit and external processes. Insofar as such solutions are able to offer a low-cost alternative to the IAP or to help organise the various bodies involved in processing RAV permits, the industry could see improved access and productivity gains.

5.1.4 Compensating, and providing incentives to, road managers

Road managers, as road asset owners, should have a reasonable level of influence over access to their road network and need to be appropriately compensated for use of that network. The policy approaches here propose the introduction of new funding arrangements for road managers and special permit fees. These policy approaches align with the Australian Government's broader Heavy Vehicle Road Reform (HVRR), which aims to implement a user charge approach that links road use to investment in road infrastructure.

Policy suggestions: Compensating and providing incentives to road managers

15: In line with the HVRR, a funding arrangement should be established, in which road managers receive a percentage of access permit fees received by the NHVR in return for processing applications in a timely manner. In cases where road manager consent is untimely, the fee should be returned to the applicant.

16: In line with the HVRR, a special project permit should be introduced for OSOM vehicles, in which a higher fee is charged for the ability of the applicant to determine a date when a final permit decision must be made. This additional fee would be subject to a refund if road manager consent is untimely.

As noted earlier, many road managers lack resources, time and an incentive to provide consent decisions in a timely and transparent manner. Our suggested policy approaches go some way towards addressing these issues by introducing a new system in which road managers have an incentive to process consent in a timely manner (by receiving a percentage of the access permit fee when processed within specified timeframes). Under this framework, road managers are not only encouraged to be more timely but may also be able to invest permit fees back into training and technology to support access decisions. However, in implementing such a reform, government would need to ensure that such a system would not introduce perverse incentives for road managers by way of for example, road managers' reliance on the revenue meaning that they are discouraged from moving away from a road being subject to a permit, or that a permit is potentially rejected because the manager has not had time to consider the application but does not want to lose the revenue.

These policy approaches have found support in both the Western Australian *State Road Funds to Local Government Agreement* (2018) and the *Review of OSOM Access Arrangements* (2018).

5.2 Substantial change in approach

The incremental policy suggestions proposed above take the current HVNL and NHVR framework and focus on improving areas of underperformance. The suggestions, however, do not take account of significant technological developments since the initial COAG decision to reform regulatory access arrangements for the trucking industry in 2009. As such, there is also an opportunity to pursue a more radical change in heavy vehicle regulation that takes advantage of new and emerging technologies.

This would involve a technological transformation of current access application processes and a streamlining of the new process so that it is fully integrated with the supply chain and route planning that is undertaken by operators.

The main goal of such reforms is to integrate existing vehicle technology and datasets on the road network to allow access determinations to be made in close to real time manner.

The approach would involve road managers and road users (i.e. operators and drivers) all contributing road management and vehicle data and the NHVR collating and centrally processing that data in a single system. Table 5.2 summarises the role and function of those different entities under this new approach. Some of these roles and processes could be achieved within current systems, although in a less integrated manner. For example, councils can currently agree with

NHVR to have access permits issued automatically but this doesn't occur within a single automated process.

Table 5.2: The role and function of road managers, road users and the NHVR under the proposed approach

Entity	Role and function within the proposed approach
Road managers	• Contribute data on the technical status of their network assets • Consider local issues (such as community concerns related to particular routes) and information on these concerns
Road users	• Record and submit details on their planned vehicle configuration and load (such as mass, axle loads and dimensions) • Use existing internal systems or a new system (integrated across all RAVs) to apply for access to a route
NHVR	• Collate information from all road owners into a single source that is both up-to-date and comprehensive • Integrate existing road user systems into central processing system • Automatically process access application through central processing system

Source: Deloitte Access Economics.

The system could make use of current advances such as artificial intelligence (AI) to manage network information and approve access applications. The goal would be to have decision rules pre-programmed to calculate and approve routes (taking into account issues such as risks to public safety and amenity) and automatically process RAV permit applications.

To the extent there are any permit applications which cannot be processed by the system, there could be an option to escalate any uncovered applications to the relevant road manager for a separate determination. With machine learning, however, uncovered applications should be rare and reduce over time. The system would finally be complemented by truck telematics applications (such as adjusted IAP systems) to monitor compliance to approved routes.

This approach to regulating access could eventually be integrated with the broader HVRR agenda, particularly with respect to charging for access. This might involve establishing an agency, which takes the data on approved routes and actual travel and calculates the flow of road access payments between road user and road manager. This integration would fall within the scope of HVRR and so is beyond the scope of the current report.

The system would also generate useful information on areas where investment in the road network would create significant benefits for the trucking industry and community. For instance, bridges and certain pinch points on the road network may be the cause of a large percentage of access denials, these points could be flagged by the system for further investigation and potential investment by road managers.

Although this approach to managing access is quite different from the current approach, the system is actually not far removed from a number of existing technologies and could involve developing these existing technologies (or at least the approach taken) into an integrated, user-friendly system.

1. **ARRB's RAVRAT:** The RAVRAT provides decision making and data recording tools for governments when processing access applications. With integration, the RAVRAT could act as a single online repository that could be used to generate information for all vehicle routes with relevant access decisions.[23]

[23] See: http://ravrat.com/.

2. **The NHVR Journey Planner:** The NHVR's Journey Planner provides visual information about access issues based on existing approved routes.[24]
3. **The NHVR Access Portal**: This portal provides an online interface for lodging applications for access which are then routed back to road owners for their decision.[25]

One potential approach to developing the proposed system is to integrate these systems – so that, instead of forming add-ons to the existing approach to regulating access, the three systems are actually able to provide a streamlined, efficient, user-friendly approach.

The following Chapter quantifies the potential economic benefits of improving access for heavy vehicles.

[24] See: http://gis.nhvr.gov.au/journeyplanner/.
[25] See: https://www.service.nhvr.gov.au/.

6 Economic benefits

This Chapter looks at the potential benefits to the economy of addressing the policy challenges identified in Chapter 4. In particular, we model the reduction in costs that could occur if heavy vehicle access was improved and more vehicles were able to operate at higher mass limits.

The benefits seen in the modelling results come mainly from the use of more productive trucks. More productive trucks are able to carry more cargo per journey. While these trucks each cost more to operate, they actually result in a lower cost per tonne of freight. This means that the overall freight task can be completed at a lower cost when more productive vehicles are used.

6.1 Approach to modelling

6.1.1 Overview of model and outputs

We have developed a model based on a range of historical inputs on the performance of the Australian economy and trucking industry extending back to 1960. Our analysis excludes Western Australian and Northern Territory as they are not regulated by the HVNL. The model projects forward just over 30 years, starting in 2019 and ending in 2050. We model the proposed changes in regulation leading to improved heavy vehicle access to start to take effect from 2020 with the full transition completed by 2030.

The key freight related outputs considered are:

1. **Net Tonnes Kilometres (NTK)**, which measures the total freight task by looking at each tonne carried across its total journey. NTK excludes the weight of the vehicle.
2. **Vehicle Kilometres Travelled (VKT)**, which measures the total kilometres travelled by vehicles to complete the freight task.
3. **Vehicle Operating Costs (VOC)**, which is the cost of associated with vehicle usage.
4. **Externality costs**, which are the costs incurred by the rest of the economy, generated by freight movements. Externalities include air pollution, greenhouse gas emissions, noise, water pollution, nature and landscape impacts, urban separation and infrastructure costs.

The outputs are computed for a base case where no further regulatory changes are made and a policy scenario in which regulatory reforms are implemented leading to improved heavy vehicle access.

The main drivers of outcomes under the policy scenario are assumptions regarding vehicle shares and weights. The vehicle shares in the policy scenario are based on previous analysis from BITRE on potential vehicle shares over the period to 2030 under a range of policy approaches (BITRE, 2011).

Further detail on the modelling approach is provided in Appendix A.

6.2 Impacts of regulatory change on Australia's trucking industry

Australia's trucking industry is growing. With or without any intervention in regulatory policy, we expect that the NTK, VKT and VOC[26] to grow steadily over time. However, under the proposed policy scenario, costs will grow more slowly, delivering benefits to the economy.

In the policy scenario, where the proposed policy approaches are adopted, efficiencies in VOC are observed to take effect shortly after 2020. The policy changes continue to generate efficiencies relative to the baseline until after the year 2030, where vehicle shares are assumed to remain constant.

Table 6.1 compares and reports on the NTK, VKT and VOC for the three categories of vehicles under the policy scenario relative to the base case. The implementation of regulatory reforms that

[26] In nominal terms. The conversion to real terms will not be meaningful as it presents an exponential growth over time.

lead to improved heavy vehicle access, changes the trucking landscape by 2050. There will be a sizeable saving for Australia in terms of VOCs. This is driven by a redistribution of NTK between the different vehicle types, with the lower NTKs for LCVs and articulated vehicles being absorbed by rigid vehicles.

Table 6.1: Difference between Baseline and Scenario results in 2050, by vehicle type

	NTK (billion tkm)	**VKT** (billion km)	**VOC** ($billion)
LCVs	0.27 lower	0.73 lower	0.60 in savings
Articulated	0.42 lower	1.17 lower	1.33 in savings
Rigid	0.69 higher	0.15 higher	-0.16 in savings
Total	**No change**	**3.7 lower**	**1.8 saved**

Source: Deloitte Access Economics

In total, **VOCs in the policy scenario are forecast to be $13.6 billion less in NPV terms**, over the period to 2050. This translates to a 3.1% saving over the period to 2050 in present value terms, should there be an adoption of regulatory reforms that lead to improved heavy vehicle access. By 2050, VOCs are expected to be 3.7% less each year, generating benefits of some $1.8 billion a year.

Similarly, **externalities are expected to be $0.5 billion less in present value terms**, over the period to 2050. This translates to a 0.3% saving over the period to 2050 under the project scenario as compared to the base case. By 2050, externalities are expected increase by 0.5% each year.

Table 6.2, below, shows the cost of externalities under the base case, policy scenario and cost savings under the policy scenario as compared to the base case. The externalities are defined as the following:

- **Air pollution**: The emission of poisonous and harmful substances in the air by motor vehicles
- **Greenhouse gas**: The emission of a type of gas capable of absorbing infrared radiation, thereby trapping and holding heat in the atmosphere
- **Noise pollution**: The propagation of annoying and harmful sounds by motor vehicles
- **Water pollution:** Pollution through organic waste or persistent toxicants run-off from roads generated from vehicle use such as engine oil leakage and disposal, and particulate matter
- **Nature and landscape:** The impact on the natural environment such as habitat loss, loss of natural vegetation or reduction in visual amenity
- **Urban separation**: The costs as a result of separation for pedestrians, reduced non-motorised transport provision, and visual intrusion in urban areas
- **Upstream and downstream**: The indirect costs of transport such as energy generation, vehicle production and maintenance, and infrastructure construction and maintenance
- **Crash**: The costs of medical care, disability care, support services and the cost of emergency services as a result of motor vehicle accidents. This also includes the cost of wanting to avoid an accident.

Table 6.2: Breakdown of externalities

Externality	Baseline NPV ($b)	Scenario NPV ($b)	Savings/ loss (%)
Air pollution	$39.8	$39.7	0.3%
Greenhouse gas	$21.7	$21.6	0.4%
Noise pollution	$7.3	$7.3	0.3%
Water pollution	$8.5	$8.5	0.2%
Nature and landscape	$8.5	$8.5	0.1%
Urban separation	$4.7	$4.7	0.4%
Upstream and downstream	$83.7	$83.4	0.3%
Crash	$2,282.8	$2,282.8	0.0%
Total	$2,457.2	$2,456.6	0.3% (excluding crash costs)

Source: Deloitte Access Economics

Among the various externalities presented in Table 6.2, the cost of crashes is the largest and the most significant. This is the result of the substantial costs to society associated with medical care, disability care, support services and emergency services. Further, there may be damages or losses in productivity from death or disablement, quality of life and damage to property caused by the crash. Crash costs are the same under the base case and policy scenario due to the way that crash costs are calculated in Australian Government guidelines. However, we acknowledge that there may potentially be some cost savings under the policy scenario due to the greater safety features associated with modern heavy vehicles that would be used more under the policy.

6.3 Impacts of regulatory change on other Australian industries

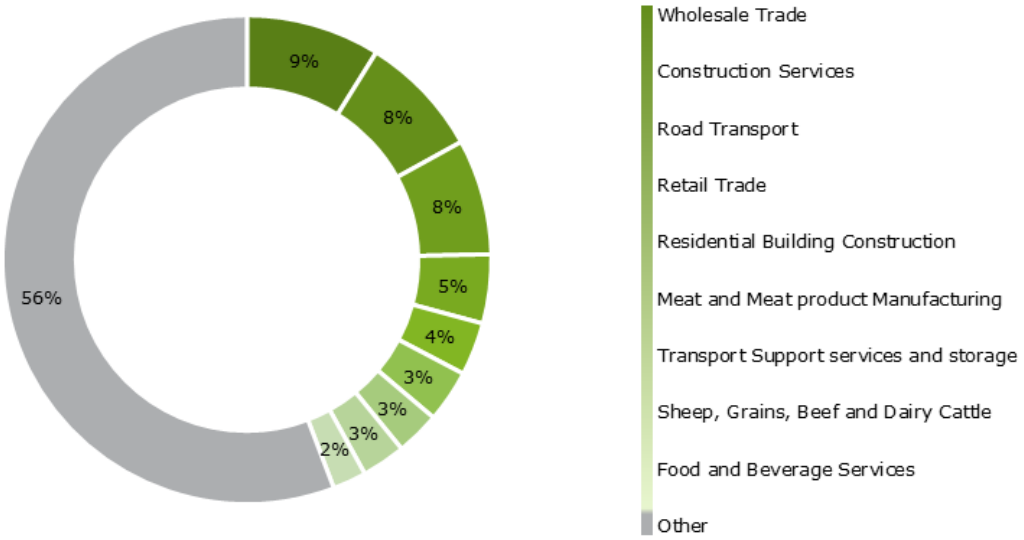
While the level of cost savings for the trucking industry itself are substantial, pursuing reform in the trucking industry is made even more important due to trucking's extensive role as an input into all other industries in the Australian economy. This Section illustrates the additional savings that could be realised in other Australian industries and everyday consumers that make use of trucking services, from a reform in heavy vehicle regulation.

All up, to meet the needs of household consumption we estimate that there is around $9.2 billion a year of trucking activity in Australia. If our policy suggestions were implemented and trucking costs fell due to the use of more efficient vehicles, we estimate that this could potentially result in a **reduction in costs for consumers in the economy of some $352 million a year in the long run** (today's dollars, realised in 2049-50) if savings are fully passed through the supply chain.

6.3.1 Impacts on Australian industries

When measured in dollar terms, the major industries that use trucking include wholesale trade, construction services, retail trade, housing construction and meat processing. Chart 6.1 shows the top 10 industries in terms of total expenditure in the economy on road transport.

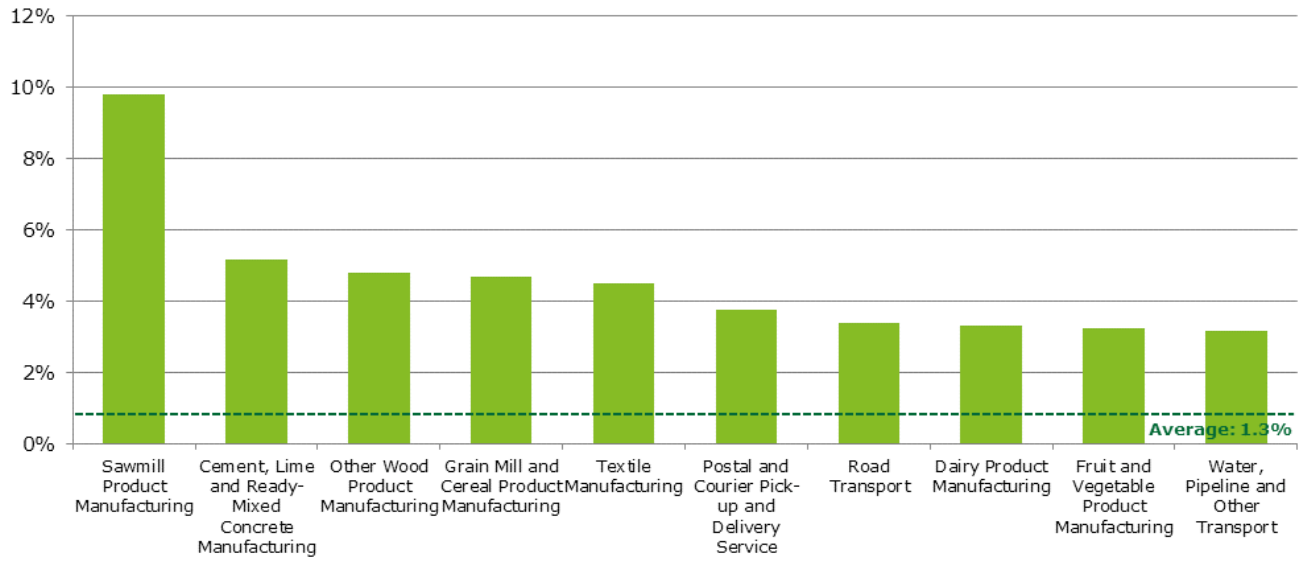
Chart 6.1: Breakdown of expenditure on road transport for top 10 industries



Source: Deloitte Access Economics, ABS

For other industries, while they spend relatively less on trucking, the expenditure represents a significant share of total industry inputs. Industries that are intensive users of trucking include lumber (where trucking is around 10% of industry inputs), and cement, wood manufacturing, grain manufacturing and textile manufacturing (all, around 5% of total industry inputs). Chart 6.2 shows the top 10 industries in terms of their expenditure on road transport as a share of their industry's total respective inputs.

Chart 6.2: Top 10 industries' expenditure on road transport as a share of inputs

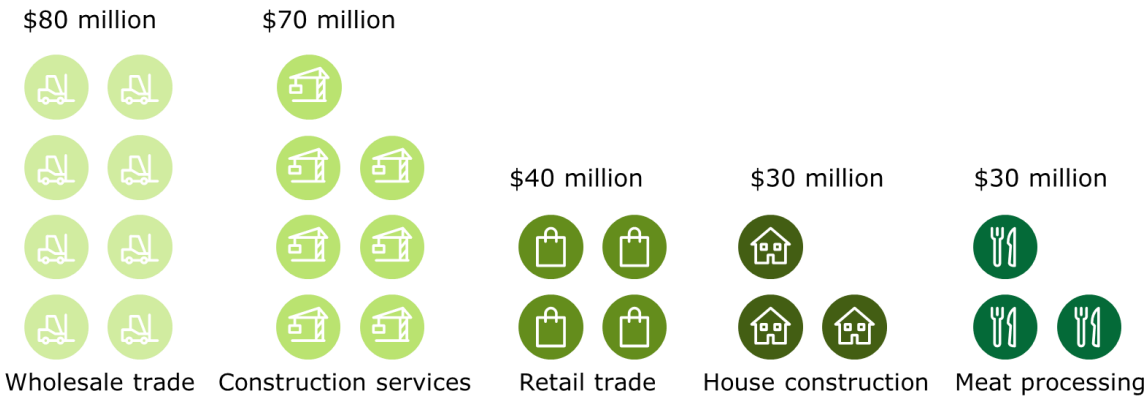


Source: Deloitte Access Economics

Given the linkages between trucking and other industries in the Australian economy, cost savings to the trucking industry could work to directly reduce the costs faced by other industries. We estimate for all industries in the economy, implementation of regulatory reforms to shift a greater proportion of trucking services to larger vehicles, could potentially amount to a reduction in costs of around **$0.9 billion a year by 2050** if savings are fully passed through the supply chain.

Figure 6.1 illustrates the potential annual cost savings for five industries that are among those with the largest total expenditure on road transport. Appendix B provides the break-down of the cost savings for each industry if savings are fully passed through the supply chain.

Figure 6.1: Annual savings in costs for select industries



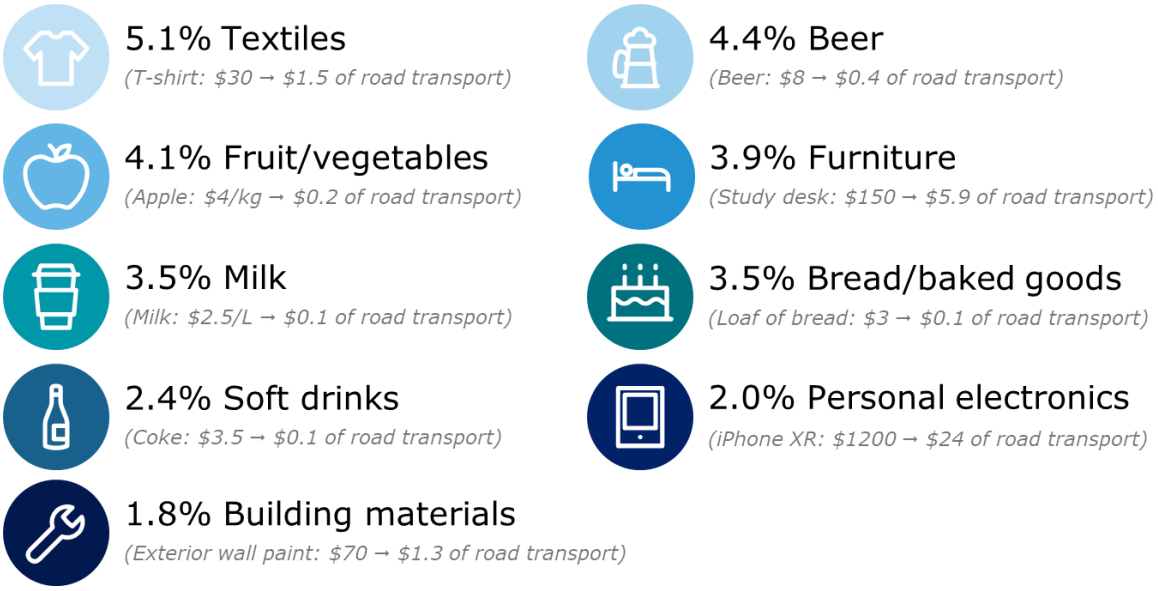
Source: Deloitte Access Economics. Note: Symbols depict $10 million increments.

6.3.2 Impacts on everyday consumer goods

From the consumer's point of view, trucking is an important component of most consumption items - every item on the shelf at a supermarket from milk to bread to clothing and shoes requires trucking to support them.

Figure 6.2 illustrates the contribution of trucking to the cost of everyday consumer goods after accounting for the full range of inputs, and the potential cost savings that could be achieved from implementing reforms to increase heavy vehicle access to our roads.

Figure 6.2: Percentage of costs made up by trucking, and example of savings in dollars

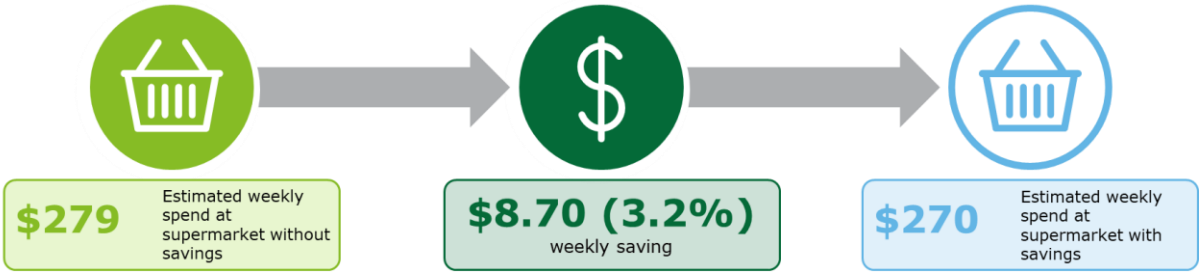


Source: Deloitte Access Economics

Note: The trucking costs for each industry are calculated taking into account the trucking costs incurred across the entire supply chain For example, the trucking costs associated with furniture accounts include those involved with timber first being trucked to the mill; mill products then being trucked to furniture factories; furniture then being trucked through the wholesale and retail supply chains; and finally, to the consumer's home.

Using the ABS' household expenditure survey (2015-16), it is estimated that households spend approximately $279 per week on everyday essential items. This includes expenditure on items such as bread, fruit, toiletries, and dairy products. We estimate the potential cost savings for the average consumer that could be achieved from implementing reforms to increase heavy vehicle access on our roads. We estimate that such reforms could save the average consumer up to $8.70 a week, or $452 per annum, on everyday purchases as seen in Figure 6.3 below, on the assumption that the savings are passed completely through the supply chain to the consumer. Appendix C provides further information on the methodology and the list of items included in the estimated weekly spend.

Figure 6.3: Example cost savings for the average consumer, in dollar terms



Source: ABS household expenditure survey 2015-16, Deloitte Access Economics.

6.4 Modelling productivity improvements

As discussed in Chapter 4, the Regulatory Impact Statement (RIS) for the NHVR anticipated that there could be significant benefits for the economy over 20 years, to the amount of around $12.4 billion (NPV) (under a best bet scenario). The majority of these gains ($8.7 billion (NPV)) were for estimated increases in productivity, and savings in compliance costs for industry ($1.9 billion (NPV)).

In light of the challenges that the industry has faced with the implementation of the NHVR, in this section of the report, we extend our economic model to consider what impact the reforms have actually had on industry productivity as compared to what was expected under the RIS.

To conduct this analysis, we estimate year-on-year changes in productivity for three groups over the period 2014-15 to 2017-18 (the years since the NHVR was introduced):

- the **actual productivity of the Transport, Postal and Warehousing industry**[27]
- a **benchmark group** capturing how productivity in the Road Transport industry could have potentially changed over time. This benchmark group is largely made up of the wholesale trade (53%), manufacturing (25%) and mining (19%) industries.
- an estimated, hypothetical path for increases in the Road Transport industry's productivity that would be needed **to realise all the productivity benefits estimated in the RIS** at the end of the 20-year period for the RIS.

For the actual productivity of the Transport, Postal and Warehousing industry, we use ABS data on the capital productivity index. For the estimated increase in productivity to meet the benefits estimated in the RIS, we use forecasted inputs in our model (total vehicle operating costs) while holding output (total NTK travelled) constant, to look how at how much of a decrease in total vehicle operating costs would be required to meet the estimated RIS productivity benefits.

However, comparing only the gap between actual industry productivity, and what was anticipated, does not take account for any changes in productivity that might have occurred over this period that were unrelated to the regulatory reforms. To control for these effects, we also look at a counterfactual or control scenario for a benchmark group in which we estimate how productivity may have changed in the absence of the NHVR. To do this, we use a weighted average of the actual productivity (using ABS' capital productivity index) of seven industries, which have historically (over the period 1995-96 to 2013-14) moved in line with productivity in the Transport, Postal and Warehousing industry.[28]

Figure 6.4 below presents the results of our modelling, showing the year-on-year change in productivity since the NHVR was introduced (2014) to today, and the preceding four years.

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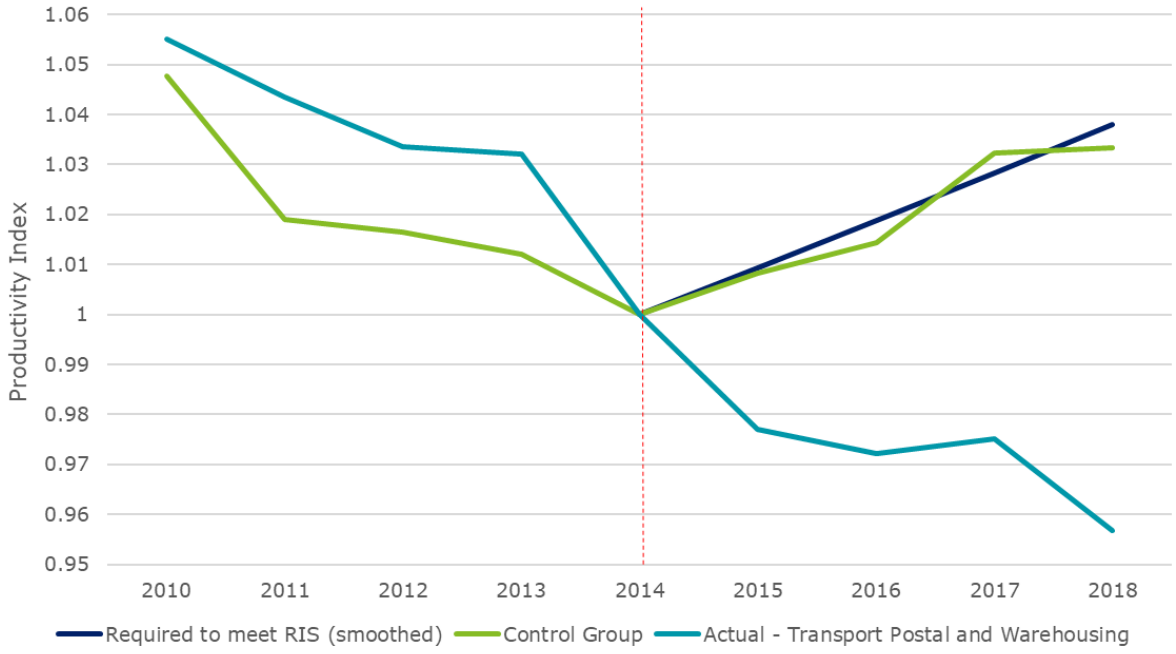
[27] ABS data is only available at the one-digit ANZSIC industry, meaning that we are unable to separate out productivity impacts for trucking as distinct from other components within the industry.
[28] The weights were calculated so that the productivity improvement in the benchmark group of industries was as close as possible to the productivity improvement in the Transport, Postal and Warehousing industry. This approach is similar to an approach called 'Synthetic Control Group'.

Figure 6.4: Productivity index, 2010-2018



Source: Deloitte Access Economics.

Our analysis shows a similar level and trend in the year-on-year change in productivity between the control group and what we estimate as the path for the Transport, Postal and Warehousing industry to realise all the productivity benefits anticipated in the RIS. This suggests that the RIS target may have been achievable. Despite the anticipated benefits, when we look at the actual productivity for the Transport, Postal and Warehousing industry, we see that it has continued to decline after 2014.

The ongoing decline in Transport, Postal and Warehousing is unlikely to be caused by the introduction of the NHVR but this analysis demonstrates that the reform has not put the industry on a new or better trajectory. This approach is useful for considering the impact of the reforms because ultimately, the benefits of reform will need to come through in productivity improvements for the trucking industry and the economy.

References

ABS. (2017a). *9208.0 - Survey of Motor Vehicle Use, Australia, 12 months ended 30 June 2016*. Retrieved November 1, 2018, from http://www.abs.gov.au/ausstats/abs@.nsf/mf/9208.0/

ABS. (2017b). *6530.0 - Household Expenditure Survey, Australia 2015-16*. Retrieved March 19, 2019, from http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/6530.0Main+Features12015-16?OpenDocument

ABS. (2018a, November 22). *3222.0 - Population Projections, Australia, 2017 (base) - 2066*. Retrieved from ABS: http://www.abs.gov.au/ausstats/abs@.nsf/latestProducts/3222.0Media%20Release12017%20(base)%20-%202066

ABS. (2018b). *5209.0.55.001 - Australian National Accounts: Input-Output Tables, 2015-16*. Retrieved November 15, 2018, from http://www.abs.gov.au/ausstats/abs@.nsf/mf/5209.0.55.001

ABS. (2018c). *5270.0 - Australian Transport Economic Account: An Experimental Transport Satellite Account*. Retrieved September 28, 2018, from http://www.abs.gov.au/AUSSTATS/abs@.nsf/Latestproducts/5270.0Main%20Features202010-11%20to%202015-16?opendocument&tabname=Summary&prodno=5270.0&issue=2010-11%20to%202015-16&num=&view=

ABS. (2018d, December 21). *6291.0.55.003 - Labour Force, Australia, Detailed, Quarterly, Nov 2018*. Retrieved from https://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6291.0.55.003Nov%202018?OpenDocument

ABS. (2018e, February 20). *8165.0 Counts of Australian Businesses, including Entries and Exits, Jun 2013 to Jun 2017*. Retrieved from ABS: http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/8165.0Main+Features1Jun%202013%20to%20Jun%202017?OpenDocument

ABS. (2018f). *Australian Industry 2016-17, Cat No. 8155.0*. Retrieved from https://www.abs.gov.au/AUSSTATS/abs@.nsf/Latestproducts/8155.0Quality%20Declaration02016-17?opendocument&tabname=Notes&prodno=8155.0&issue=2016-17&num=&view=

ACIL Tasman. (2004). *Trucking – Driving Australia's Growth and Prosperity.* Melbourne, VIC: ACIL Tasman.

ATA. (2014, February 14). *Friday Facts - ATA welcomes Heavy Vehicle National law*. Retrieved October 16, 2018, from Australian Trucking Association: http://www.truck.net.au/newsletters/friday-facts/friday-facts-ata-welcomes-heavy-vehicle-national-law

ATA. (2016). *Description of truck configurations.* Forrest, ACT: ATA.

ATA. (2018, May 11). *Submission to House of Representatives Standing Committee on Economics.* Retrieved October 18, 2018, from https://www.aph.gov.au/DocumentStore.ashx?id=208c9b85-4667-4f94-bfe8-7b8db6869cac&subId=565964

Australia Post. (2018). *Inside Australian Online Shopping.*

Australian Logistics Council. (2009). *The cost impact of regulation disparity in cross-border regions - a study encompassing the 'Sunraysia/Riverland region'.* Barton, ACT: Australian Logistics Council.

Austroads. (2018). *Local Road Access for High Productivity Freight Vehicles.* Sydney, Australia: Austroads.

BITRE. (2011). *Truck productivity: sources, trends and future prospects.* Canberra, ACT: Department of Infrastructure and Transport.

BITRE. (2014). *Freightline 1—Australia freight transport .* Canberra, ACT: BITRE.

BITRE. (2015). *Traffic and congestion cost trends for Australian capital cities.* Canberra, ACT: BITRE.

BITRE. (2016). *Australian road freight estimates: 2016 update.* Canberra, ACT: BITRE.

BITRE. (2017). *Australian Infrastructure Statistics Yearbook 2017*. Retrieved October 12, 2018, from https://bitre.gov.au/publications/2017/yearbook_2017.aspx

Centre for International Economics. (2011). *Benefit-cost analysis: National Heavy Vehicle Regulator (NHVR) model law.* Canberra, ACT: Centre for International Economics.

Department of Finance. (2006). *Handbook of Cost Benefit Analysis.* Canberra, ACT: Commonwealth Government.

Department of State Growth. (2018). *Tasmanian heavy vehicle enforcement transfers to NHVR*. Retrieved from Department of State Growth Transport: https://www.transport.tas.gov.au/latest_news/the_national_heavy_vehicle_regulator_update

IBISWorld. (2018). *Road Freight Transport - Australia Industry Report.* Los Angeles, California: IBISWorld.

National Transport Commission. (2011). *Heavy Vehicle National Law Regulation Impact Statement September 2011 .* Melbourne, VIC: National Transport Commission.

National Transport Commission. (2014). *Harmonisation of Pilot and Escort Vehicle Driver Requirements - National Accreditation Scheme Discussion Paper.* Melbourne, VIC: National Transport Commission.

National Transport Commission. (2016). *Who Moves What Where: Freight and Passenger Transport in Australia.* Melbourne, VIC: National Transport Commission.

National Transport Commission. (2017). *Assessing the effectiveness of the PBS scheme: Discussion paper.* Melbourne, VIC: National Transport Commission.

National Transport Commission. (2018a). *Reforming the Performance-Based Standards scheme: Policy paper.* Melbourne, VIC: National Transport Commission.

National Transport Commission. (2018b). *Review of Regulatory Telematics Report.* Melbourne, Vic: National Transport Commission.

National Transport Insurance. (2016). *NTI's Guide to the Trucking Industry 2016.* Sydney, NSW: National Transport Insurance.

NHVR. (2013). *An industry guide to access under the Heavy Vehicle National Law.* Brisbane, QLD: NHVR.

NHVR. (2016). *National heavy vehicle mass and dimension limits.* Brisbane, QLD: NHVR.

NHVR. (2017a, August 22). *ACT Class 1 permit applications to return to NHVR*. Retrieved from NHVR website: https://www.nhvr.gov.au/news/2017/08/22/act-class-1-permit-applications-to-return-to-nhvr

NHVR. (2017b). *Annual Report 2016-17.* Brisbane, Qld: NHVR.

NHVR. (2017c). *Issues Paper: 2017 Drafting of the National Higher Mass Limit Declaration.* Brisbane, QLD: NHVR.

NHVR. (2018a). *Annual Report 2017-18.* Brisbane, QLD: NHVR.

NHVR. (2018b). *Delegations project*. Retrieved from NHVR website: https://www.nhvr.gov.au/road-access/access-management/delegations-project

NHVR. (2018c). *Heavy Vehicle National Law Major Legislative changes commencing 1 October 2018: A guide for judicial officers and legal practitioners.* Brisbane: NHVR.

NHVR. (2018d). *National Harmonisation Program*. Retrieved from NHVR website: https://www.nhvr.gov.au/road-access/national-harmonisation-program

NHVR. (2018e). *Performance Based Standards: A guide for road managers.* Brisbane, QLD: NHVR.

NHVR. (2018f, May 28). *Victorian Class 1 permits transferred to NHVR Portal*. Retrieved from NHVR website: https://www.nhvr.gov.au/news/2018/05/28/victorian-class-1-permits-transferred-to-nhvr-portal

NSW Government Transport for NSW. (2016). *Principles and Guidelines for Economic Appraisal of Transport Invesment and Initiatives.* Sydney, NSW: NSW Government Transport for NSW.

OECD. (2018a). *Freight transport*. Retrieved October 20, 2018, from http://data.oecd.org/transport/freight-transport.htm

OECD. (2018b). *Population*. Retrieved October 31, 2018, from https://data.oecd.org/pop/population.htm

Office of Best Practice Regulation. (2016). *Cost-Benefit Analysis – Guidance Note.* Canberra, ACT: Department of the Prime Minister and Cabinet.

Queensland Audit Office. (2016). *Heavy vehicle road access reforms.* Brisbane, QLD: Queensland Audit Office.

Queensland Department of Transport and Main Roads. (n.d.). *Pilot and escort vehicle driver*. Retrieved November 20, 2018, from https://www.tmr.qld.gov.au/business-industry/Accreditations/Pilot-and-escort-vehicle-driver.aspx

South Australia Government. (2017). *Heavy vehicle permits*. Retrieved from South Australia Government: https://www.sa.gov.au/topics/driving-and-transport/heavy-vehicles/operating-a-heavy-vehicle/heavy-vehicle-permits

Transport Certification Australia. (2016). *Intelligent Access Program - Overview of the IAP Functional and Technical Specification.* Melbourne, Australia: Transport Certification Australia.

Transport Certification Australia. (2018a). *Improvements to the Intelligent Access Program (IAP).* Melbourne, VIC: Transport Certification Australia.

Transport Certification Australia. (2018b). *National Telematics Framework – Levels of Assurance.* Melbourne, Australia: Transport Certification Australia.

WA Government, Mainroads WA and WA Local Government Association. (2018). *State Road Funds to Local Government Agreement 2018/19 to 2022/23.* Retrieved from Mainroads WA: https://www.mainroads.wa.gov.au/Documents/State%20Road%20Funds%20to%20Local

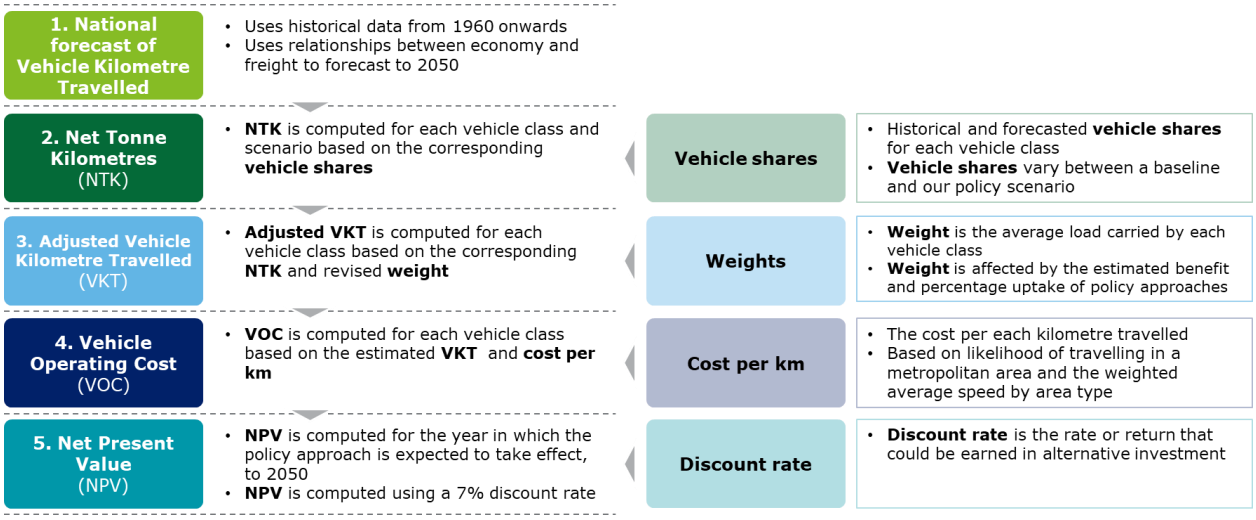
%20Government%20Agreement%202018-19%20to%202022-23.RCN-D18%5E23957281.PDF

WSP. (2018). *Review of Oversize Overmass (OSOM) Access Arrangements.* Perth, WA: WSP.

Appendix A: Modelling approach

The approach to modelling is summarised in Figure A.1, with each step explained in detail below.

Figure A.1: Model process



Source: Deloitte Access Economics

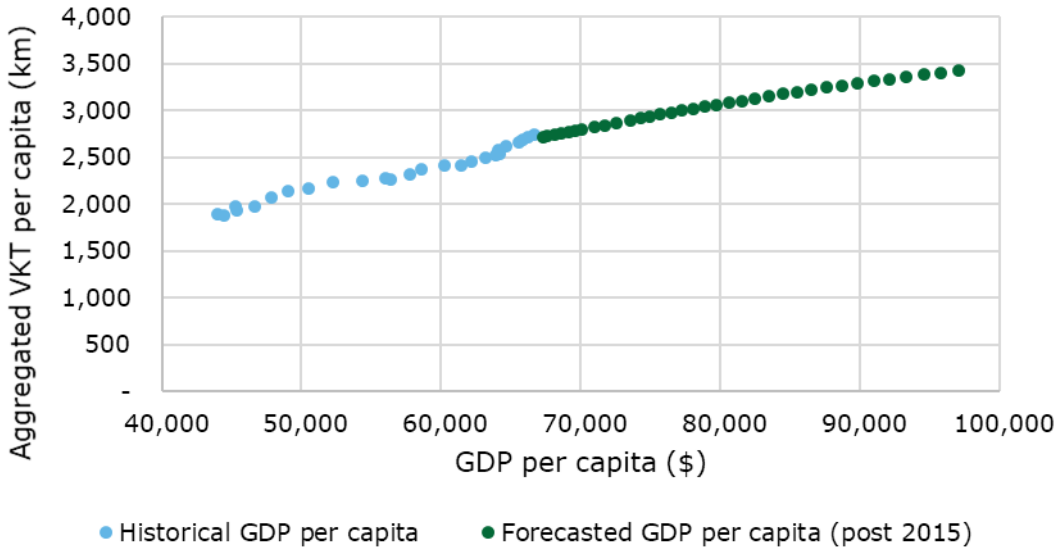
A.2. Vehicle Kilometres Travelled (VKT)

The model starts with an initial forecast of VKT for all freight in Australia.

Historical data shows that VKT per capita has been increasing despite a decline in VKT in certain vehicle types, and here has been a strong relationship between VKT per capita and gross domestic product GDP per capita (see Chart A.2).

We have forecast VKT by projecting forward historical data from BITRE (2015), and assuming a continuation of the historical relationship between freight and GDP per capita. We sourced GDP forecasts from Deloitte Access Economics and population projections from the Australian Bureau of Statistics (ABS).

Chart A.1: Location of trucking operators, 1990 to 2050



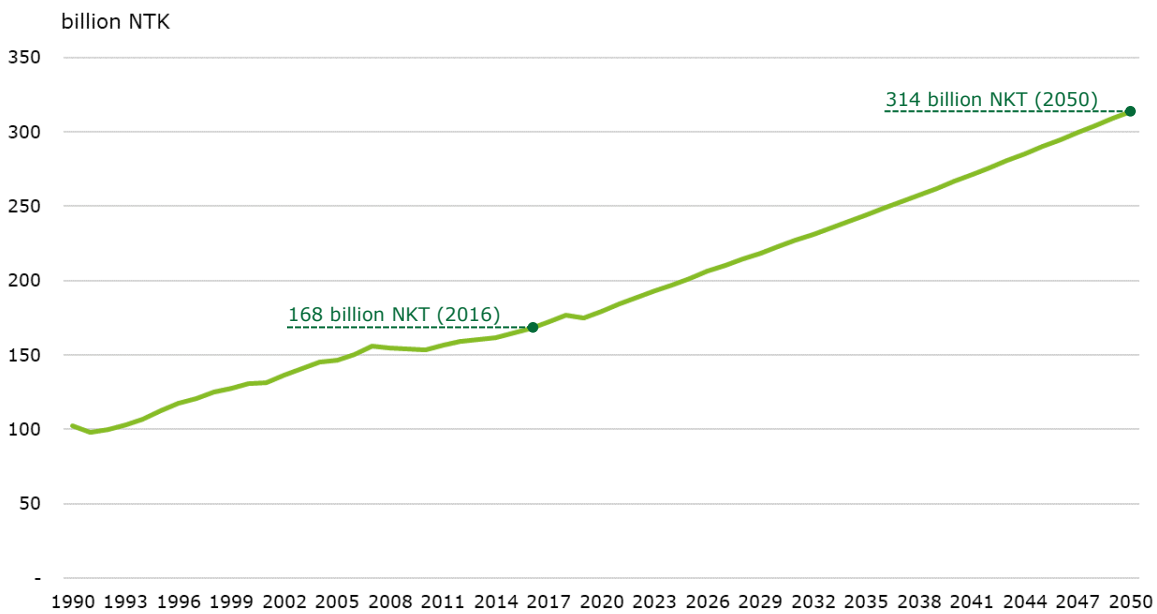
Source: Deloitte Access Economics, BITRE, ABS

A.3. Net Tonne Kilometres (NTK)

We sourced data on NTK for the years 2007 to 2016 from the ABS' Survey of Motor Vehicle Use (SMVU) (2017a). We project this historical data into the future by applying the per annum growth in forecasted VKT. This approach results in a fairly steady, linear growth in total NTK over the period to 2050, as seen in Chart A.2, below.

In our model, road freight volumes increase by 87%, from around 168 billion tonne kilometres in 2016 to around 314 billion tonne kilometres in 2050; an average growth rate of around 1.9% per year.

Chart A.2: Total NTK, 1990 to 2050



Source: Deloitte Access Economics, ABS.

A.4. Vehicle shares

Next, we apply vehicle shares to the NTK forecast.

Previous analysis from BITRE provides historical and forecasted shares of NTK for different freight vehicles types in Australia over the period to 2030 (BITRE, 2011). A common trend observed in historical vehicle shares across the years is the steady decline in Light Commercial Vehicles (LCVs) and Rigid Vehicles, with demand shifting towards articulated vehicles – that is, vehicles with the capacity to transport heavier loads.

However, since the BITRE forecast, online purchases - in both transaction count and size – has grown alongside the rise in e-commerce and demand for online shopping. In Australia Post's recent report on trends in online shopping, they have reported that online purchases and shopping expenditure has risen by 19.2% and 18.7% respectively, amounting to $21.3 billion (Australia Post, 2018). This growth is expected to draw more on LCVs, the primary choice of vehicle for delivering goods purchased online, as the size and scale of online shopping continues to expand in Australia. While this trend is not reflected in the vehicle shares, this has limited to no impact on LCVs, as the Heavy Vehicle National Law does not concern this vehicle type. As such, LCV is not within the scope of this report.

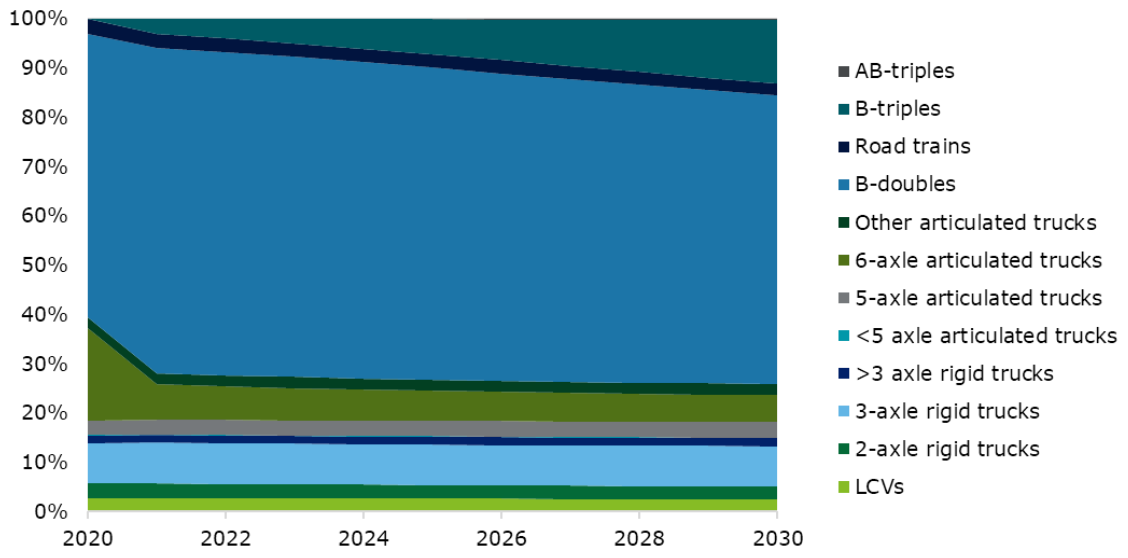
BITRE's report considers different scenarios of vehicle shares such as 'higher B-double' and 'extended IAP/PBS network access'. It is therefore useful for analysing improvements in heavy vehicle access.

For our policy scenario, which analyses the impact of increased heavy vehicle access, we use a combination of BITRE's 'higher B-double' and 'extended IAP/PBS network access'. This provides for the following:

- by 2021, a rising share of NTK for B-doubles, reaching a maximum of around 66% of NTK.
- between 2021 – 2030, a transition with B-triples operating on B-double routes, and AB-triple and BAB-quad heavy vehicle types operating on road train routes beyond 2021.
- post-2030, the impact of the change in policy is assumed to be completed, and so vehicle shares are assumed to be constant.

Assumed vehicle shares are shown in Chart A.3 below.

Chart A.3: Heavy Vehicle shares



Source: Deloitte Access Economics, BITRE

A.5. Adjusted Vehicle Kilometres Travelled (VKT)

We then recalculate VKT based on the NTK for each vehicle class and the weight of the average load carried under the policy scenario.

We calculate the potential increase in vehicle weights based on differences between General Mass Limits (GML) and Higher Mass Limits (HML) as set out in documentation prepared by the National Heavy Vehicle Regulator (NHVR) (2016).

Under the policy scenario, more vehicles would likely operate at the limits of HML and this would increase the average weight of vehicles in each vehicle class where HML is applicable. We apply the percentage increase in vehicle weight to average observed vehicle weights reported in the ABS' SMVU (2017a).

Table A.1 below presents the vehicle weights used in the baseline and policy scenario. In practice, the increased load is equivalent to a productivity improvement in the economy. The productivity improvement implies that an increased load results in a lower VKT as fewer trips must be made to transport the same amount of goods.

Table A.1: Average vehicle loads

Vehicle Class	Baseline average load (t)	Scenario average load (t)	Percentage change (%)
2-axle rigid trucks	1.1	1.1	0.0%
3-axle rigid trucks	10.5	10.6	1.1%
>3 axle rigid trucks	7.3	7.5	2.8%
<5 axle articulated trucks	15.8	15.8	0.0%
5-axle articulated trucks	23.5	23.8	1.3%
6-axle articulated trucks	23.4	24.2	3.5%
Other articulated trucks	38.3	40.0	4.4%
B-doubles	38.3	40.0	4.4%
Road trains	72.4	75.2	3.9%
B-triples	50.6	53.1	4.8%
AB-triples	60.7	63.3	4.3%

Source: Deloitte Access Economics

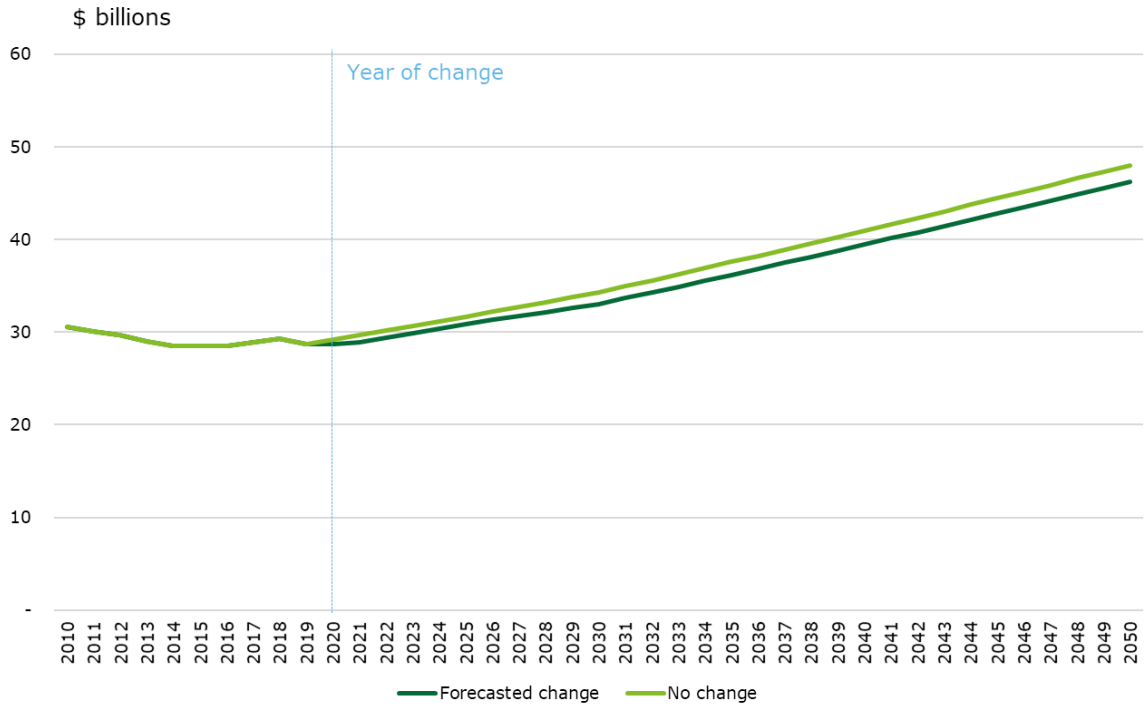
A.6. Vehicle Operating Costs (VOC) and externalities

The VOC is determined by the distance travelled and the associated cost per kilometre.

A number of factors influence the cost per kilometre – that is, vehicle class, speed, road characteristics and the likelihood of the vehicle travelling in a metropolitan or regional area. We account for each of these factors in the modelling by using a range of VOC values published by Transport for NSW (2016).

We have aggregated Transport for NSW's data on VOC into a weighted average cost per vehicle kilometre for each vehicle class. We then multiply this cost by the policy scenario VKT to estimate the total cost of operating heavy vehicles in Australia over the period to 2050. The results of the VOCs are presented in Chart A.4 below.

Chart A.4: Vehicle operating costs



Source: Deloitte Access Economics, Transport for NSW

Similarly, we calculate externalities based on a vehicle kilometre basis using unit rates published by Transport for NSW (NSW Government Transport for NSW, 2016). The externalities considered in the modelling are air pollution, greenhouse gas emissions, noise, water pollution, nature and landscape impacts, urban separation and infrastructure costs.

A.7. Net Present Value (NPV)

Finally, the NPV of both VOC and externality costs are used to summarise and quantify the value of the potential regulatory changes. A discount rate of 7% is used as an input to the NPV calculations. This is in line with requirements from the Office of Best Practice Regulation (2016) and Department of Finance (2006).

A.8. Flow on effects for other industries and consumers

To understand the impacts of the proposed regulatory changes on other industries and consumers, we use the ABS' input-output tables (ABS, 2018b). Input-output tables show the economic relationships between different industries and consumers and, for the purposes of this report, show how road transport flows through the economy – carrying goods from one industry to another and delivering them for consumption by households.

It is important to note that we have not calculated multipliers or other economic impacts based on the input-output table. Rather, we have used the input-output table to look at cost structures throughout the economy and the role of road transport.

Appendix B: Break-down of costs by industry

Industry	Savings ($m)	Proportion of total (%)
Accommodation	3.76	0.4%
Agriculture, Forestry and Fishing Support Services	2.73	0.3%
Air and Space Transport	14.78	1.7%
Aircraft Manufacturing	0.99	0.1%
Aquaculture	0.35	0.0%
Arts, Sports, Adult and Other Education Services (incl community education)	1.19	0.1%
Automotive Repair and Maintenance	2.93	0.3%
Auxiliary Finance and Insurance Services	7.57	0.9%
Bakery Product Manufacturing	4.95	0.6%
Basic Chemical Manufacturing	6.77	0.8%
Basic Non-Ferrous Metal Manufacturing	14.85	1.7%
Beer Manufacturing	4.99	0.6%
Broadcasting (except Internet)	0.47	0.1%
Building Cleaning, Pest Control and Other Support Services	2.83	0.3%
Cement, Lime and Ready-Mixed Concrete Manufacturing	17.63	2.0%
Ceramic Product Manufacturing	0.96	0.1%
Cleaning Compounds and Toiletry Preparation Manufacturing	1.12	0.1%
Clothing Manufacturing	0.12	0.0%
Coal mining	10.21	1.2%
Computer Systems Design and Related Services	2.62	0.3%
Construction Services	71.91	8.1%
Dairy Product Manufacturing	15.40	1.7%
Defence	2.62	0.3%
Domestic Appliance Manufacturing	0.55	0.1%
Electrical Equipment Manufacturing	1.46	0.2%
Electricity Generation	2.81	0.3%
Electricity Transmission, Distribution, On Selling and Electricity Market Operation	1.05	0.1%
Employment, Travel Agency and Other Administrative Services	6.91	0.8%
Exploration and Mining Support Services	2.25	0.3%
Finance	1.53	0.2%
Fishing, hunting and trapping	0.48	0.1%
Food and Beverage Services	19.70	2.2%
Footwear Manufacturing	0.24	0.0%
Forestry and Logging	2.57	0.3%
Forged Iron and Steel Product Manufacturing	0.30	0.0%
Fruit and Vegetable Product Manufacturing	5.25	0.6%
Furniture Manufacturing	3.30	0.4%
Gambling	2.07	0.2%

Industry	Savings ($m)	Proportion of total (%)
Gas Supply	0.75	0.1%
Glass and Glass Product Manufacturing	2.76	0.3%
Grain Mill and Cereal Product Manufacturing	8.83	1.0%
Health Care Services	18.60	2.1%
Heavy and Civil Engineering Construction	18.32	2.1%
Heritage, Creative and Performing Arts	1.16	0.1%
Human Pharmaceutical and Medicinal Product Manufacturing	5.04	0.6%
Insurance and Superannuation Funds	2.05	0.2%
Internet Service Providers, Internet Publishing and Broadcasting, Websearch Portals and Data Processing	0.22	0.0%
Iron and Steel Manufacturing	7.78	0.9%
Iron Ore Mining	3.29	0.4%
Knitted Product Manufacturing	0.02	0.0%
Library and Other Information Services	0.05	0.0%
Meat and Meat product Manufacturing	30.59	3.5%
Metal Containers and Other Sheet Metal Product manufacturing	1.72	0.2%
Motion Picture and Sound Recording	1.18	0.1%
Motor Vehicles and Parts; Other Transport Equipment manufacturing	7.11	0.8%
Natural Rubber Product Manufacturing	0.21	0.0%
Non Ferrous Metal Ore Mining	9.36	1.1%
Non Metallic Mineral Mining	2.00	0.2%
Non-Residential Building Construction	18.29	2.1%
Non-Residential Property Operators and Real Estate Services	4.40	0.5%
Oil and gas extraction	2.59	0.3%
Oils and Fats Manufacturing	1.63	0.2%
Other Agriculture	6.46	0.7%
Other Fabricated Metal Product manufacturing	3.35	0.4%
Other Food Product Manufacturing	8.56	1.0%
Other Manufactured Products	1.27	0.1%
Other Non-Metallic Mineral Product Manufacturing	1.70	0.2%
Other Repair and Maintenance	3.94	0.4%
Other Services	0.55	0.1%
Other Wood Product Manufacturing	15.69	1.8%
Ownership of Dwellings	0.88	0.1%
Paper Stationery and Other Converted Paper Product Manufacturing	4.95	0.6%
Personal Services	2.21	0.2%
Petroleum and Coal Product Manufacturing	4.72	0.5%
Plaster and Concrete Product Manufacturing	2.41	0.3%
Polymer Product Manufacturing	8.36	0.9%
Postal and Courier Pick-up and Delivery Service	18.36	2.1%
Poultry and Other Livestock	4.38	0.5%
Primary and Secondary Education Services (incl Pre-Schools and Special Schools)	5.46	0.6%
Printing (including the reproduction of recorded media)	2.30	0.3%
Processed Seafood Manufacturing	0.77	0.1%
Professional, Scientific and Technical Services	14.00	1.6%

Industry	Savings ($m)	Proportion of total (%)
Professional, Scientific, Computer and Electronic Equipment Manufacturing	1.59	0.2%
Public Administration and Regulatory Services	6.36	0.7%
Public Order and Safety	2.86	0.3%
Publishing (except Internet and Music Publishing)	3.51	0.4%
Pulp, Paper and Paperboard Manufacturing	1.97	0.2%
Rail Transport	8.92	1.0%
Railway Rolling Stock Manufacturing	0.88	0.1%
Rental and Hiring Services (except Real Estate)	5.27	0.6%
Residential Building Construction	31.11	3.5%
Residential Care and Social Assistance Services	7.08	0.8%
Retail Trade	40.43	4.6%
Road Transport	67.68	7.6%
Sawmill Product Manufacturing	15.66	1.8%
Sheep, Grains, Beef and Dairy Cattle	25.71	2.9%
Ships and Boat Manufacturing	0.89	0.1%
Soft Drinks, Cordials and Syrup Manufacturing	3.19	0.4%
Specialised and other Machinery and Equipment Manufacturing	4.47	0.5%
Sports and Recreation	3.56	0.4%
Structural Metal Product Manufacturing	10.15	1.1%
Sugar and Confectionery Manufacturing	3.88	0.4%
Tanned Leather, Dressed Fur and Leather Product Manufacturing	1.22	0.1%
Technical, Vocational and Tertiary Education Services (incl undergraduate and postgraduate)	6.80	0.8%
Telecommunication Services	5.80	0.7%
Textile Manufacturing	0.85	0.1%
Textile Product Manufacturing	1.57	0.2%
Transport Support services and storage	25.72	2.9%
Veterinary Pharmaceutical and Medicinal Product Manufacturing	0.20	0.0%
Waste Collection, Treatment and Disposal Services	2.84	0.3%
Water Supply, Sewerage and Drainage Services	1.84	0.2%
Water, Pipeline and Other Transport	11.43	1.3%
Wholesale Trade	78.55	8.9%
Wine, Spirits and Tobacco	2.67	0.3%
Total	885	100%

Appendix C: Cost saving estimates for weekly household spend on everyday items

The table below contains items that have been included in our calculations of the weekly household expenditure on everyday items. This list (and the prices for each item) have been taken from the ABS' Household Expenditure Survey, 2015-16. We have excluded from this list items considered not part of a consumer's typical weekly shopping (such as holidays or vehicle registration) or those not directly impacted by trucking (such as medical fees or gambling).

After refining the list of items, we then mapped each item to a relevant industry. To estimate the savings for each item, we then applied the percentage savings for each industry from implementing reforms in the trucking industry, as calculated in the model and presented in Appendix B above. It is assumed that the savings are passed completely through the supply chain to the consumer.

Item	Original price	Industry	Saving (%)	Saving ($)	Adjusted price
Food and non-alcoholic beverages					
Food and non-alcoholic beverages nfd	$17.61	Other Food Product Manufacturing	3.7%	$0.65	$16.96
Bread	$7.44	Grain Mill and Cereal Product Manufacturing	4.2%	$0.31	$7.13
Flour	$0.35	Grain Mill and Cereal Product Manufacturing	4.2%	$0.01	$0.34
Cakes, biscuits, puddings and related products	$9.06	Bakery Product Manufacturing	3.5%	$0.31	$8.74
Cereals and pasta	$4.91	Grain Mill and Cereal Product Manufacturing	4.2%	$0.21	$4.70
Meat (excluding fish and seafood) nfd	$2.26	Meat and Meat Product Manufacturing	3.1%	$0.07	$2.19
Processed meat (including ham, bacon and sausages)	$9.70	Meat and Meat Product Manufacturing	3.1%	$0.30	$9.41
Beef and veal	$5.20	Meat and Meat Product Manufacturing	3.1%	$0.16	$5.04
Mutton and lamb	$3.04	Meat and Meat Product Manufacturing	3.1%	$0.09	$2.95
Pork (excluding bacon and ham)	$1.91	Meat and Meat Product Manufacturing	3.1%	$0.06	$1.85
Poultry	$6.37	Meat and Meat Product Manufacturing	3.1%	$0.19	$6.17
Game	$0.02	Meat and Meat Product Manufacturing	3.1%	$0.00	$0.02
Offal	$0.32	Meat and Meat Product Manufacturing	3.1%	$0.01	$0.31
Other meat (excluding fish and seafood)	$0.15	Meat and Meat Product Manufacturing	3.1%	$0.00	$0.14
Fish and seafood nfd	$0.16	Processed Seafood Manufacturing	2.9%	$0.00	$0.15
Fish and seafood	$6.31	Processed Seafood Manufacturing	2.9%	$0.18	$6.13
Eggs and egg products	$2.17	Dairy Product Manufacturing	3.5%	$0.08	$2.09
Dairy products	$16.13	Dairy Product Manufacturing	3.5%	$0.57	$15.57

Item	Original price	Industry	Saving (%)	Saving ($)	Adjusted price
Edible oils and fats	$1.66	Oils and Fats Manufacturing	3.4%	$0.06	$1.60
Fruit and nuts nfd	$0.13	Fruit and Vegetable Product Manufacturing	4.1%	$0.01	$0.12
Fresh fruit	$13.04	Fruit and Vegetable Product Manufacturing	4.1%	$0.54	$12.50
Canned, frozen and bottled fruit	$0.80	Fruit and Vegetable Product Manufacturing	4.1%	$0.03	$0.76
Dried fruit and nuts	$2.77	Fruit and Vegetable Product Manufacturing	4.1%	$0.11	$2.66
Vegetables nfd	$0.15	Fruit and Vegetable Product Manufacturing	4.1%	$0.01	$0.14
Fresh vegetables	$14.08	Fruit and Vegetable Product Manufacturing	4.1%	$0.58	$13.50
Frozen vegetables	$1.17	Fruit and Vegetable Product Manufacturing	4.1%	$0.05	$1.12
Other vegetables	$1.86	Fruit and Vegetable Product Manufacturing	4.1%	$0.08	$1.78
Sugar	$0.31	Sugar and Confectionery Manufacturing	1.9%	$0.01	$0.30
Syrups, honey, jams, jellies and desserts	$1.12	Soft Drinks, Cordials and Syrup Manufacturing	2.4%	$0.03	$1.09
Confectionery	$14.05	Soft Drinks, Cordials and Syrup Manufacturing	2.4%	$0.34	$13.71
Spices, herbs, sauces, spreads, and other food additives	$6.14	Other Food Product Manufacturing	3.7%	$0.23	$5.92
Canned spaghetti and baked beans	$0.27	Other Food Product Manufacturing	3.7%	$0.01	$0.26
Packaged prepared meals	$5.79	Other Food Product Manufacturing	3.7%	$0.21	$5.58
Non-alcoholic beverages nfd	$0.68	Soft Drinks, Cordials and Syrup Manufacturing	2.4%	$0.02	$0.66
Soft drinks and packaged waters	$6.40	Soft Drinks, Cordials and Syrup Manufacturing	2.4%	$0.15	$6.24
Fruit and vegetable juice	$2.55	Other Food Product Manufacturing	3.7%	$0.09	$2.46
Tea and coffee	$3.61	Other Food Product Manufacturing	3.7%	$0.13	$3.48
Food drinks	$2.57	Soft Drinks, Cordials and Syrup Manufacturing	2.4%	$0.06	$2.51
Cordials and unpackaged milk based beverages	$0.72	Soft Drinks, Cordials and Syrup Manufacturing	2.4%	$0.02	$0.71
Other food and non-alcoholic beverages	$0.24	Other Food Product Manufacturing, Soft Drinks, Cordials and Syrup Manufacturing	3.1%	$0.01	$0.24
Alcoholic beverages					
Alcoholic beverages	$6.32	Wine, Spirits and Tobacco	1.9%	$0.12	$6.20
Beer	$11.01	Beer Manufacturing	4.4%	$0.49	$10.53
Wine	$10.96	Wine, Spirits and Tobacco	1.9%	$0.21	$10.75
Spirits	$5.10	Wine, Spirits and Tobacco	1.9%	$0.10	$5.00
Other alcoholic beverages	$0.83	Wine, Spirits and Tobacco	1.9%	$0.02	$0.81
Tobacco products					
Tobacco products	$12.70	Wine, Spirits and Tobacco	1.9%	$0.24	$12.46
Medical care and health expenses					
Medicines and pharmaceutical products	$16.45	Human Pharmaceutical and Medicinal Product Manufacturing	2.6%	$0.42	$16.03
Recreation					
Books, newspapers, magazines and other printed material	$6.89	Publishing (except Internet and Music Publishing)	2.2%	$0.15	$6.73

Item	Original price	Industry	Saving (%)	Saving ($)	Adjusted price
Animal expenses	$13.04	Veterinary Pharmaceutical and Medicinal Product Manufacturing	3.2%	$0.41	$12.63
Personal care					
Toiletries and cosmetics	$17.57	Cleaning Compounds and Toiletry Preparation Manufacturing	2.5%	$0.43	$17.14
Miscellaneous goods and services					
Stationery equipment	$4.75	Other Manufactured Products	2.4%	$0.12	$4.64
Total	**$278.86**		**3.2%**	**$8.70**	**$270.16**

Source: (ABS, 2017b). Note: Prices have been adjusted to today's dollars using inflation rates reported by DIIS.

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