



Increasing heavy vehicle volumetric load capacity
without increasing mass limits
Policy Paper

Report outline

Title	Increasing heavy vehicle volumetric load capacity without increasing mass limits
Type of report	Policy Paper
Purpose	Recommendations approved by the Transport and Infrastructure Council in May 2017
Abstract	This paper recommends options for safely increasing the size (volume) and productivity of heavy vehicles operating at masses less than the standard maximum.
Key words	Heavy vehicles, freight, safety, productivity, HVNL, volumetric load increase, volumetric freight
Contact	National Transport Commission Level 15/628 Bourke Street Melbourne VIC 3000 Ph: (03) 9236 5000 Email: enquiries@ntc.gov.au www.ntc.gov.au
ISBN	978-0-6480156-9-7

Contents

Executive summary	1
Current practice and opportunities to improve	1
Discussion paper proposals and feedback	2
Conclusions and recommendations	4
Implementation	6
1 Introduction	7
1.1 Background	7
1.2 Key objective of increasing heavy vehicle productivity	7
1.3 Previous papers	8
1.4 How to read this paper	9
2 Current practice and opportunities to improve	10
2.1 Limited response so far by road managers to this opportunity	10
2.2 Legislative requirements are ambiguous	11
2.3 Reasons why road managers are denying access to limit pavement wear and damage	12
2.4 Challenges for road managers determining an acceptable mass limit	12
2.5 Differences between access requests made by the NHVR on their own and others' behalf	13
2.6 PBS vehicles are still not being given broad road network access	13
2.7 Current access arrangements for key heavy vehicle types	13
3 Discussion paper proposals and feedback	15
3.1 Proposed heavy vehicle types	15
3.2 Proposed, increased road access for heavy vehicle types	16
3.3 Proposed implementation options	20
4 Conclusions and recommendations	22
4.1 Heavy vehicle types	22
4.2 Increased road access for heavy vehicle types	22
4.3 Implementation options	24
5 Implementation	26
5.1 Legislative amendments	26
5.2 Road assessments for restricted access heavy vehicles	26
5.3 Communicating changes and providing training	27
5.4 Publishing volumetric road networks	27
Appendix: Assumptions made in assessing recommendation benefits	28
5.5 Recommendation 1: General access for PBS Level 1 heavy vehicles	28
5.6 Recommendations 3: Heavy vehicles of up to 30 m total length	29
5.7 Assumption limitations	29
6 References	30

List of tables

Table 1. Proposed heavy vehicle types and dimension increases	15
Table 2. Road access options proposed in the discussion paper	16
Table 3. Prescriptive and PBS Level 1 heavy vehicle length limits and road access levels	17

List of figures

Figure 1. Historical increase in the road freight task.	8
Figure 2. Some current examples of heavy vehicle productivity gains by lengthening.	10
Figure 3. A segment of the Victorian higher productivity freight network map.	11
Figure 4. Length increases for rigid heavy vehicles to above 12.5 m and semi-trailers from 19 to 20 m.	17
Figure 5. A standard 26 m B-double compared with a 30 m B-double	18

Executive summary

This paper sets out options to allow larger heavy vehicles to increase their productivity on Australia's road network without reducing road safety or damaging road infrastructure.

Many heavy vehicles carrying lighter-weight loads (such as hay, cotton or empty shipping containers) are currently operating at less than their maximum mass limit. There is the opportunity to permit these vehicles to be physically larger and increase their freight volume if they remain under their legal mass limit.

Key objective of increasing heavy vehicle productivity

The key objective of this reform is to identify options for increasing heavy vehicle productivity.

Productivity growth is essential to improving Australians' standards of living. Heavy vehicle productivity is a measure of how efficiently a heavy vehicle (an input, requiring an operator to invest capital to procure and operate the vehicle) may generate an output (quantity of freight transported on the vehicle).

The productivity gains of adopting the recommendations in this paper could be as much as \$1.5 billion per annum if fully adopted. Increasing rigid heavy vehicle length by 2 metres could reduce fleet numbers from about 70,000 by up to 7 per cent or 5,000 fewer vehicles. More broadly, adopting 30 m B-double numbers could reduce their numbers from about 22,500 by up to 7.6 per cent or 1,700 fewer vehicles. The estimated savings in vehicle operating costs of these reductions are almost \$0.5 billion for rigid heavy vehicles and over \$1 billion for B-doubles.

Previous papers

This policy paper follows two preceding papers published by the NTC in 2016:

- An [issues paper](#) (NTC 2016a) set out key issues, including the road safety impacts of larger heavy vehicles, their potential impact on road infrastructure and how best to regulate larger vehicles. Options for increasing the volumetric capacity of heavy vehicles were identified, and stakeholder submissions were invited.
- A subsequent [discussion paper](#) (NTC 2016b) incorporated stakeholder feedback and set out six options for increasing the volumetric load capacity of heavy vehicles. Five of the options relating to allowing longer heavy vehicles access to more roads, and the sixth related to granting higher heavy vehicles access to more roads.

Current practice and opportunities to improve

Heavy vehicles are restricted from accessing some roads. Road managers apply criteria including:

- whether a heavy vehicle 'fits' on a given road, and
- whether the road is strong enough to support it.

Heavy vehicles operate in a range of configurations and it is impracticable for regulators to assess them all on an individual basis. They manage this by grouping heavy vehicles into standard types.

For example, the standard means of assessing a B-double's access is at its standard limits – i.e. 25 m long and 62.5 t total mass. A disadvantage is that a given B-double may be denied access to a road due to its standard maximum mass (62.5 t) being too high, even though its lesser, actual operating mass (e.g. 42 t) may be acceptable.

Some state road managers told us that they are already giving access to heavy vehicles at acceptable mass limits – including where those limits are less than the standard maximum.

A key example is the Victorian government's Moving More with Less strategy, under which VicRoads has published road access maps for higher productivity heavy vehicles at different mass limits. Where other road managers have given access to heavy vehicles at non-standard mass limits, it has predominantly been under permit arrangements. That approach limits the benefits, as it is typically restricted to an individual operator.

A road manager may deny an access request by assessing that consenting would cause damage to road infrastructure. But the normal operation of any vehicle on a road will cause some pavement wear.

Road managers are increasingly developing strategic road networks that encourage heavy vehicles to operate on preferred roads – as assessed against criteria including relative pavement wear. But there is a risk of road managers using this power in ways that result in greater net costs and potentially greater pavement wear.

Road managers have told us that accurately assessing the acceptable mass limit of a given road can require significant resources. But there is evidence of road managers being more conservative in how they assess restricted access heavy vehicles than those with as-of-right (general) access.

Road managers usually assess access requests differently between those made for:

- adding a road to a given heavy vehicle type’s as-of-right, gazetted road network
- allowing an individual operator of one or a restricted number of heavy vehicles to access a given road – via permit

Increasing as-of-right access by adding a road to a notice provides sustainable productivity improvements. This is because the increased access is made available to all operators, rather than just the one applying for permit access.

The Performance Based Standards (PBS) scheme is designed to allow access by more productive (larger) heavy vehicles, where applicants can demonstrate that the proposed vehicle meets the PBS safety standards. But road managers are yet to give adequate road access to PBS vehicles.

An example is where they have denied broad road access under the PBS Level 1 network, where prescriptive heavy vehicles have been given general access.

Current access arrangements for key heavy vehicle types

This section describes current access arrangements for some relevant, selected heavy vehicle types. Access for **PBS Level 1** heavy vehicles is described above.

Road managers are progressively increasing access for **A- and B-doubles up to 30 m long**. Transport ministers agreed in November 2014 to assess key national freight routes for their capacity to accommodate these vehicles.

South Australia has the most extensive PBS Level 2b (30 m length limit) road network – it is a moderately limited version of its 26 m B-double network.

Road access for **B-triples and AB-triples** is relatively restricted. Access is restricted to non-metropolitan and remote roads in Queensland, New South Wales, South Australia, the Northern Territory and Western Australia.

Road access arrangements for **heavy vehicles up to 4.6 m high** vary between states and territories.

Discussion paper proposals and feedback

Proposed heavy vehicle types

The discussion paper described a number of heavy-vehicle-based options. These are shown in the table below..

Proposed heavy vehicle types	Proposed dimension increase	From	To
Longer rigid heavy vehicles	Length limit	12.5	20
Longer semi- and truck-trailers		19	20
Longer B-doubles		26	30
A-doubles replacing B-doubles			
B-triples and AB-triples replacing B-doubles			
Height increase	Height limit	4.3	4.6

Stakeholders mostly supported, or did not oppose the proposed heavy vehicle types and dimensional increases. The proposed dimension increases provide potential productivity benefits. However, those benefits may only be realised if the vehicles are given sufficient road access.

Proposed, increased road access for heavy vehicle types

The discussion paper described preferred options for how each of the heavy vehicle types may be given increased road access. All of the proposed heavy vehicle types already operate on the roads to at least some degree. The productivity gains sought through this reform would be from increasing their road access. The preferred options for that are shown in Table 2.

Each road access option is described separately for prescriptive (non-PBS) and PBS-approved heavy vehicles. PBS heavy vehicles have separately-designated road networks to their prescriptive counterparts. They are also assessed to a higher performance standard – with the intention that they may access a broader part of the road network than prescriptive heavy vehicles.

Proposed heavy vehicle types	Proposed increase in road access	
	Prescriptive heavy vehicle	PBS heavy vehicle
Longer rigid heavy vehicles	No increased access	General access for PBS Level 1 heavy vehicles
Longer semi- and truck-trailers		
Longer B-doubles	Increase access to parts of B-double and 32 m road train networks	Increase access – expand PBS Level 2b network
A-doubles replacing B-doubles		
B-triples and AB-triples replacing B-doubles	Increase access to parts of B-double and 36.5 m road train networks	Increase access – expand PBS Level 3a network
Height increase	General access	

Queensland Transport and Main Roads (QTMR) and VicRoads supported the proposal to give **longer PBS Level 1 rigid heavy vehicles** general access to the road network. Transport for New South Wales (TfNSW) and the Tasmanian Department of State Growth preferred that expanded access be negotiated with local governments. But that process is inefficient – causing lengthy delays and is resource-intensive.

TfNSW and ACT were concerned about increasing the maximum length of rigid heavy vehicles from 12.5 to 20 m. They were concerned that these vehicles may not be capable of safely operating on the broader road network. But their length is practically limited by their need to be designed in a way that meets the PBS Level 1 safety standards.

No jurisdictions objected to the proposal to give **longer PBS Level 1 semi- and truck-trailers** general access to the road network. The length increase of only 1 m would have a lesser effect than the proposal for longer rigid heavy vehicles.

The proposals to increase access for **longer A- and B-doubles** were mostly supported in-principle. VicRoads and TfNSW restricted their support to only PBS-approved heavy vehicles.

There was limited support for the option of **B-triples and AB-triples replacing B-doubles**.

There was support for the option to **increase heavy vehicle height**. States including Victoria and Queensland had already implemented the proposal. The predominant view of road agencies and managers was that more clearly making operators responsible for assessing the overhead clearance of their vehicles would better clarify their responsibilities and liabilities.

General benefits (for all of the road access options) include:

- Fewer heavy vehicles on the roads, due to productivity gains resulting from using longer and higher heavy vehicles.
- Increased safety of road users - where longer and higher heavy vehicles are assessed to the higher PBS safety standards than the prescriptive vehicles they would replace.

Benefits of **longer PBS Level 1 heavy vehicles** (rigids, semi- and truck trailers) being given as-of-right, general access to the road network:

- an increases in rigid heavy vehicle length of 2 m could reduce rigid heavy vehicle numbers from about 70,000 by up to 7 per cent, or 5,000 vehicles¹
- a productivity increase of 8 per cent for a 1 m increase in total length (from 19 to 20 m) for a semi- or truck-trailer

¹ Based on the size of the national fleet of (larger) 3, 4 and 5 axle rigid vehicle numbers only.

- less red tape for heavy vehicle operators gaining approval to operate PBS Level 1 heavy vehicles.
- resources of road managers and the National Heavy Vehicle Regulator (NHVR) being freed up by not having to assess individual applications for PBS Level 1 heavy vehicles.

The key benefit of the proposal for **longer A- and B-doubles** was that increasing vehicle length by 4 m to 30 m could reduce B-double numbers from about 22,500 by up to 7.6 per cent, or 1,700 vehicles. The estimated savings in vehicle operating costs of these reductions are over \$1 billion .

The key benefit of **increase heavy vehicle height** is the greater productivity from broader road access and use of these vehicles. Another benefit is a clearer responsibility on operators to assess their vehicle would clear overhead hazards on given roads. Proposed implementation options

Proposed implementation options

Some jurisdictions preferred not to **make legislative changes** giving general access to PBS Level 1 at this time. But the proposal can only be effectively implemented that way.

There was mixed support for **making legislative changes** authorising the NHVR to grant road access without the formal consent of road managers and in limited circumstances. TfNSW were concerned that the proposal would mean ‘by-passing’ local road managers – who they believed needed to be part of the decision-making process.

Jurisdictions generally supported the proposal **for identifying roads to assess** that the NHVR and road authorities coordinate assessments and report to ministers.

No jurisdiction opposed the proposal **for standardising road access assessment approaches**, with VicRoads and TfNSW supporting it and others not responding. However, discussion with jurisdictional officers revealed to us that they may have interpreted the proposal differently than how we intended.

VicRoads and TfNSW offered support for the proposed **heavy vehicle standards option** to develop a policy for utilising both PBS and prescriptive standards. But their support was for such a policy to uniformly apply PBS standards (at least for heavy vehicles carrying an increased volume of freight, without increasing the applicable mass limits). This is not what we intended such a policy may recommend.

Jurisdictions supported this proposed **option for terms of access** - to progressively transition increases in access from permit to as-of-right access.

Conclusions and recommendations

Heavy vehicle types

All of the proposed vehicle types were supported, although there was less support for **B-triples and AB-triples replacing B-doubles** than other types.

Increased road access for heavy vehicle types

We assessed that the benefits of giving as-of-right, general access to **longer PBS Level 1 heavy vehicles** substantially outweighed the costs. We assessed the potential benefits at about \$0.5 billion and resulting from about 5,000 less rigid heavy vehicles needed if their length could be increased by 2 m.

Recommendation 1: General access for PBS Level 1 heavy vehicles

Amend the Heavy Vehicle National Law (HVNL) to grant PBS Level 1 heavy vehicles as-of-right, general access to the road network at up to the same mass limits as other heavy vehicles already operating under the same as-of-right, general access conditions.

We assessed that broad road access for **longer A- and B-doubles** had a potential benefit of \$1 billion, resulting from about 1,700 fewer B-doubles needed to transport the same amount of freight.

Broader feedback by jurisdictions revealed some differing interpretations of how to conduct access assessments that support volumetric principles. To better clarify that, we developed some guiding principles for their consistent application.

The overarching, guiding principle is to grant increased road access to heavy vehicles with increased volumetric load capacity, but no mass increase.

Supporting guiding principles are:

- No reduction in safety.
- No increase in mass.
- No need to re-assess vertical loading impact.
- Develop a tiered volumetric road network.
- Only assess relevant on-road performance criteria.
- Focus on utilising existing, standard heavy vehicle configurations.
- Road infrastructure constraints to guide how volumetric road networks are developed.

Recommendation 2: Guiding principles

The NHVR and road managers adopt the guiding principles for increasing allowed volume where mass is not the constraint.

While jurisdictions supported increasing the road access of longer A- and B-doubles, they were more mixed in their support for the types of roads to which we proposed they extend access. We have amended the proposal to delegate more responsibility to jurisdictions for identifying which roads are most suitable for increasing access to longer A- and B-doubles.

Recommendation 3: Incorporate the guiding principles in developing road networks for heavy vehicles of up to 30 m total length

That state and territory governments incorporate the guiding principles for increasing volumetric load capacity in identifying suitable road networks for 30m A-doubles and B-doubles.

Due to lesser support by jurisdictions for the proposal to increase access for **B-triples and AB-triples replacing B-doubles**, we have not made any specific recommendations for increasing their access.

There was broad support for the proposal to make operators of **higher heavy vehicles** (up to 4.6 m) more responsible for determining safe road access.

Recommendation 4: Operators to determine suitable access for heavy vehicles up to 4.6 m in height.

Amend the HVNL to give effect to the height increase for semi-trailers not approved under the PBS safety standards and incorporating the conditions as prescribed in these recommendations.

Implementation options

The preferred option to **amend the HVNL** to grant general access to PBS Level 1 heavy vehicles is addressed by Recommendation 1.

We have not made any recommendation for amending the HVNL to grant road access to heavy vehicles of a type to which a road manager has effectively, but not formally, already consented. Jurisdictions were concerned that this matter required more careful consideration than was practical within the scope of this reform and paper.

The **preferred option for identifying roads to assess** was for the NHVR and road authorities to coordinate assessments and report to ministers. There was broad support for this option, which is addressed in the Implementation section.

The **preferred option for standardising road access assessment approaches** was to develop standardised road assessment and reporting criteria. While there was in-principle support for the proposal, we concluded from stakeholder discussions that a challenge would be influencing road managers to adopt the criteria.

We concluded that a more effective means of influencing road managers to adopt the key principles proposed in this paper would be to amend the HVNL requirements for how they may respond to an access request.

In particular, we concluded that there was no reason why a road manager should deny a heavy vehicle access, due to road infrastructure damage associated with the vehicle's proposed mass. Rather, the principles as proposed in this paper and broadly supported by stakeholders would mean that a road manager would prescribe an acceptable mass limit.

Recommendation 5: Separate road access consent for heavy vehicles and applicable mass limits

Amend the HVNL to allow the NHVR to require a road manager to respond to a road access request by consenting to mass limits they have assessed would not damage road infrastructure.

The **preferred heavy vehicle standards option** was to develop a policy for utilising both PBS and prescriptive standards. This proposal received mixed support from jurisdictions. Due to the complexities and different views on this issue, we have not made any associated recommendations in this paper.

The **preferred option for terms of access** was to progressively transition from permit to as-of-right access. This proposal received strong support from jurisdictions. There is no need for and we have not made any formal recommendations.

Implementation

Legislative amendments

Legislative amendments would need to be developed to implement:

- Recommendation 1: General access for PBS Level 1 heavy vehicles
- Recommendation 4: Operators to determine suitable access for heavy vehicles up to 4.6 metres in height
- Recommendation 5: Separate road access consent for heavy vehicles and applicable mass limits

Subject to ministerial agreement, the NTC will prepare a draft Bill to amend the HVNL for consideration in late 2017.

Road assessments for restricted access heavy vehicles

Implementation here refers to the discrete task of developing specific road networks under Recommendation 3 only - for state and territory road agencies, and the NHVR to assess and declare road networks for A- and B-doubles up to 30 m in length.

Responsibility would be with state and territory road agencies, and the NHVR to develop plans for how they would conduct road assessments. We recommend that the NHVR report on those plans for consideration by Council at its 2nd round of meetings 2017 and then periodically on their implementation status.

Communicating changes and providing training

Recommendation 2 is for legislative amendments requiring road managers to change how they assess and respond to heavy vehicle road access requests. Effectively implementing the recommendation would require the NHVR to communicate and provide some training on the nature of the changes to road managers. Deliverables may include published training materials and training workshops as necessary.

Publishing volumetric road networks

Developing volumetric road networks that vary with heavy vehicle mass includes publishing them. The preferred medium for this type of publication is increasingly online, such as with the NHVR's Journey Planner.

1 Introduction

Key points

This paper recommends options for safely increasing the size (volume) and productivity of heavy vehicles operating at masses less than the standard maximum. These recommendations are made for Ministers' consideration.

The common practice of road managers assessing heavy vehicles' access at mass limits only has created an opportunity to increase access for those at lower masses. We were asked to identify options utilising that opportunity to better support Heavy Vehicle National Law objectives.

Heavy vehicle traffic levels are forecasted to increase. Raising heavy vehicle productivity would mitigate that increase and put downward pressure on the prices of freight and consumer goods.

This paper follows previous issues and discussion papers that we published, and stakeholder consultation.

1.1 Background

The total national road freight task was forecast to increase 1.8 times from 2008 to 2030 (Bureau of Infrastructure, Transport and Regional Economics, 2010).

Increasing the productivity of heavy vehicles is vital to managing this growth. Failing in this will mean more heavy vehicles on roads, higher road maintenance costs and more greenhouse gas emissions. These can all increase end prices for consumers.

Many previous heavy vehicles reforms have focused on increasing mass limits. The scope for further mass increases has progressively narrowed. Governments are now investigating other means to increase heavy vehicle productivity.

In 2014, transport ministers asked the National Transport Commission (NTC) to investigate the potential for productivity gains with heavy vehicles that are physically larger and able to transport a greater volume of freight while remaining within their maximum mass limits.

This policy paper recommends options to allow larger heavy vehicles on Australia's road network to increase their productivity without reducing road safety or damaging road infrastructure.

Many heavy vehicles carrying lighter-weight loads (such as cotton, wool or empty shipping containers) are currently operating at less than their maximum mass limit. Potential exists for these vehicles to be physically larger to increase their freight volume if they remain under their mass limit.

A volumetric road network is based on:

- Heavy vehicle type
- Mass limits at which the heavy vehicle may operate
- Roads on which the vehicle may operate, at a given mass limit.

In addition, road managers are unnecessarily denying heavy vehicles access to roads because they are assessing them at their maximum mass limit. A significant proportion operate below their limit, but are denied access to roads they could safely operate on without damaging infrastructure.

1.2 Key objective of increasing heavy vehicle productivity

The key objective of this reform is to identify options for increasing heavy vehicle productivity.

The economic term 'productivity' is commonly used as a measure of how efficiently inputs are converted into outputs. It is typically used to capture how much output an entity, sector or economy is generating with its inputs, i.e., the amount of output per unit of input.

Improvements in the efficiency of turning land transport inputs into outputs (or 'productivity growth' in economic terms) are essential to improving Australians' standards of living. Productivity growth

can directly improve the material wellbeing of individuals, as well as the competitiveness and profitability of businesses by lowering prices for consumers, raising real wages for employees, lowering costs for businesses and raising their profits, and raising tax revenues for governments.

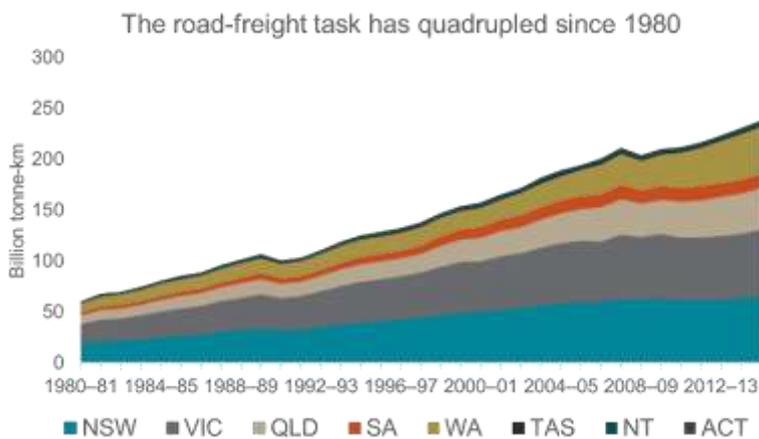
Heavy vehicle productivity is a measure of how efficiently a heavy vehicle (an input, requiring an operator to invest capital to procure and operate the vehicle) may generate an output (quantity of freight transported on the vehicle). The greater the quantity of freight a heavy vehicle transports, the higher its productivity.

The freight task in Australia has increased substantially in the last few decades with total freight volumes quadrupling over the past four decades, predominantly due to significant growth in road freight. The bulk of this freight, by weight, is served by trucks, which move around 70 per cent, with rail moving around 28 per cent.²

Increasing heavy vehicle productivity is vital to managing this growth. Failing to increase it would mean more heavy vehicles on roads, higher road maintenance costs and more greenhouse gas emissions. These can all increase end prices for consumers.

The productivity gains of adopting the recommendations in this paper could be as much as \$1.5 billion per annum if fully adopted. Increasing rigid heavy vehicle length by 2 meters could reduce fleet numbers from about 70,000 by up to 7 per cent or 5,000 less vehicles. More broadly adopting 30 m B-double numbers could reduce their numbers from about 22,500 by up to 7.6 per cent or 1,700 fewer vehicles. The estimated savings in vehicle operating costs of these reductions are almost \$0.5 billion for rigid heavy vehicles and over \$1 billion for B-doubles.

Figure 1. Historical increase in the road freight task.



1.3 Previous papers

This policy paper follows two preceding papers published by the NTC in 2016:

- An [issues paper](#) (NTC 2016a) set out key issues, including the road safety impacts of larger heavy vehicles, their potential impact on road infrastructure and how best to regulate larger vehicles. Options for increasing the volumetric capacity of heavy vehicles were identified, and stakeholder submissions were invited.
- A subsequent [discussion paper](#) (NTC 2016b) incorporated stakeholder feedback and set out six options for increasing the volumetric load capacity of heavy vehicles. Five of the options relating to allowing longer heavy vehicles to access more roads, and the sixth related to higher heavy vehicles to access more roads.
- A list of bodies that made submissions on the 2016 discussion paper is shown below.

² The remaining two per cent is mainly coastal shipping with negligible amounts of domestic freight carried by air. See: BITRE, *A dozen facts about transport in Australia*, November 2016, p. 5.

Consultation, NTC 2016 discussion paper

- Australian Trucking Association
- Ergon Energy
- NatRoad
- Queensland Department of Transport and Main Roads
- Roads ACT
- Transport Certification Australia
- Transport for New South Wales
- Truck Industry Council
- VicRoads.

1.4 How to read this paper

This policy paper was developed following stakeholder consultation on the issues and discussion papers we published in 2016.

Section 2 describes relevant aspects of legislation and current practice in how the NHVR and road managers administer heavy vehicle road access. It focuses on matters relevant to the paper's objective of assessing options for the broader use of heavy vehicles carrying an increased volume of freight, without increasing the applicable mass limits.

Section 3 describes the proposals made in the discussion paper, stakeholder feedback we received on them, analysis of both and assessments of their benefits.

Section 4 draws conclusions on each proposal and makes recommendations. The recommendations were developed for the consideration of ministers. Some of the discussion paper proposals were amended and some we have not proceeded with as recommendations in this paper.

Section 5 describes how the recommendations may be implemented, subject to their being approved by ministers.

2 Current practice and opportunities to improve

The reform focuses on assessing options for the broader use of heavy vehicles carrying an increased volume of freight, without increasing the applicable mass limits.

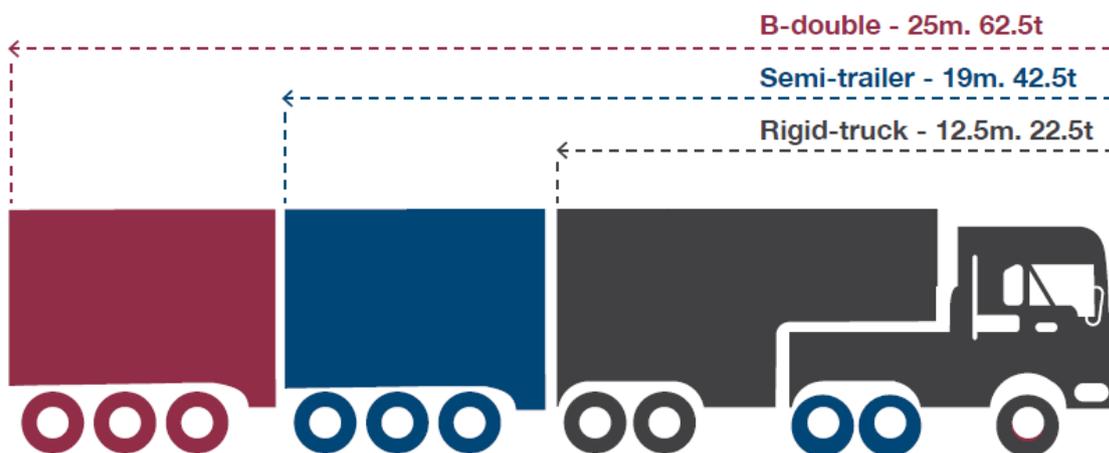
This opportunity arises from the practice of governments matching an increase in the size (volumetric load capacity) of a heavy vehicle with an increase in maximum mass.

Heavy vehicles are restricted from accessing some roads. Road managers apply criteria including:

- whether a heavy vehicle 'fits' on a given road
- whether the road is strong enough to support it.

Heavy vehicles operate in a range of configurations and it is impracticable for regulators to assess them all on an individual basis. They manage this by grouping heavy vehicles into standard types. Figure 2 illustrates three common types, as defined by their maximum length and mass.

Figure 2. Some current examples of heavy vehicle productivity gains by lengthening.



For the example heavy vehicle types in Figure 2, the HVNL gives as-of-right, general access to the rigid truck and semi-trailer. But the HVNL defines the B-double as a restricted access vehicle, meaning that road managers must consent before it may operate on a given road.

The standard means of assessing a B-double's access is at its standard limits – i.e. 25 m long and 62.5 t total mass.³ A disadvantage is that a given B-double may be denied access to a road due to its standard maximum mass (62.5 t) being too high, even though its lesser, actual operating mass (e.g. 42 t) may be acceptable.

The consequence would be transporting freight on a less productive heavy vehicle, such as a semi-trailer. This would mean higher freight costs, increased heavy vehicle traffic and road maintenance costs.

Ideally, a road manager would approve that B-double to operate at its lesser, acceptable mass limit. This is both an opportunity, but also a challenge as it increases the complexity of the road manager's task.

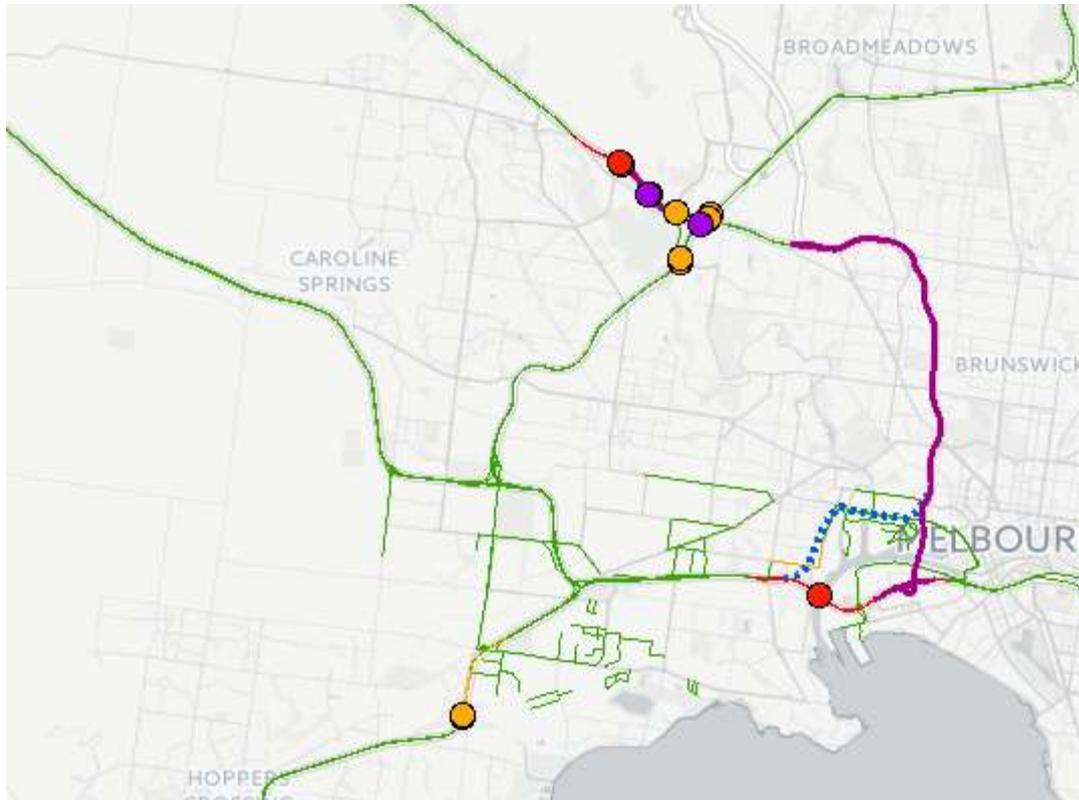
2.1 Limited response so far by road managers to this opportunity

Some state road managers told us that they are already giving access to heavy vehicles at acceptable mass limits – including where those limits are less than the standard maximum.

³ There are some variations on these limits for modern B-doubles, which have been neglected for the purposes of simplifying this example.

A key example is the Victorian government's Moving More with Less strategy, under which VicRoads has published road access maps for higher productivity heavy vehicles at different mass limits. A sample of those maps is shown in Figure 3, with the coloured circles indicating different mass limits at which higher productivity B-doubles may access those points on the road.

Figure 3. A segment of the Victorian higher productivity freight network map.



The access arrangements in Figure 3 are significant, as they are published. Where other road managers have given access to heavy vehicles at non-standard mass limits, it has predominantly been under permit arrangements. That approach limits the benefits, as it is typically restricted to an individual operator.

Anecdotal evidence is that local government road managers are less responsive. Local governments tend to have less resources and expertise than larger state and territory road agencies.

More can be done to increase road access for heavy vehicles carrying an increased volume of freight, without increasing the applicable mass limits.

2.2 Legislative requirements are ambiguous

The HVNL makes requirements for how road managers must determine heavy vehicle road access. This is to ensure that road manager decisions are made against national (HVNL) objectives. There are broadly two heavy vehicle categories – those with:

- as-of-right, general access – nominally heavy vehicle up to 19 m in length and 42.5 t total mass
- restricted access - heavy vehicles exceeding those limits, that may only operate on a road with consent of the road manager

The HVNL requires road managers to respond to an NHVR request for restricted road access by a heavy vehicle. A road manager may only deny an access request by assessing that consenting would:

- cause damage to road infrastructure
- result in loss of amenity to the community (i.e. increased noise, emissions or traffic congestion)
- pose significant risks to public safety

The criterion of 'caus[ing] damage to road infrastructure' is ambiguous. Clear examples are a heavy vehicle:

- that cannot be manoeuvred within the geometric constraints of a road and would strike road infrastructure – such as light poles and kerbs
- with a maximum mass that exceeds the structural integrity of a bridge on a given road – with a risk of causing serious damage or its collapse

The first of those criteria is associated with a heavy vehicle's on-road performance characteristics and is unrelated to its operating mass. The second can be mitigated by a road manager setting an acceptable mass limit (as proposed in this paper).

But there is some ambiguity in determining a threshold of road infrastructure damage, beyond which a road manager should deny access. The normal operation of any vehicle on a road will cause some pavement wear. By interpreting this wear as damage, a road manager could deny access to all restricted access heavy vehicles on all roads under their control.

Policy makers, including the NTC, did not develop the HVNL with the intention of that criterion providing road managers with such a broad power. If interpreted that way, it would not support the HVNL objective of 'promot[ing] industry productivity and efficiency in the road transport of goods and passengers by heavy vehicles'.

2.3 Reasons why road managers are denying access to limit pavement wear and damage

Some road managers have told us that they are denying heavy vehicles road access for the stated purpose of limiting pavement wear and damage. Roads are constructed to varying standards, which means that heavy vehicles cause some pavements to wear more rapidly than others. By denying heavy vehicles access to roads with more vulnerable pavements and diverting them onto roads with more durable pavements, road managers can minimise net pavement wear.

An example of where this practice may yield benefits is where multiple routes are available for a heavy vehicle's journey. Road managers are increasingly developing strategic road networks that encourage heavy vehicles to operate on preferred roads – as assessed against criteria including relative pavement wear.

Providing a given quality and quantity of heavy vehicle road access with the minimum degree of pavement wear is a valid objective. It supports the HVNL objective (NHVR, 2016) of 'manag[ing] the impact of heavy vehicles on.. road infrastructure'.

But there are some risks with this practice. One circumstance is where a road manager's preferred road causes an operator to cover a significantly longer distance. Another is where a road manager may deny access to a road ostensibly to prevent pavement wear, but by directing heavy vehicle traffic and associated costs onto another (adjoining) manager's roads.

Road managers may only deny access to heavy vehicles with restricted access. Operators may respond by continuing to access the road with less productive, as-of-right heavy vehicles (e.g. 19 m-long semi-trailers).

Each of those three circumstances describe how road managers may use HVNL powers to deny access in an attempt to limit pavement wear, but which may result in greater net costs and potentially pavement wear.

2.4 Challenges for road managers determining an acceptable mass limit

Road managers have told us that accurately assessing the acceptable mass limit of a given road can require significant resources. This is particularly when it is necessary to assess a bridge's structural capacity. It is impracticable to conduct bridge assessments for every, or even most, heavy vehicle access requests. This presents a challenge for identifying options by which road managers may determine an acceptable mass limit, instead of outright denying a heavy vehicle access to a given road.

The HVNL makes road managers responsible for determining whether a road is suitable to be accessed by a heavy vehicle. But feedback to us by road managers is that they typically lack the resources to exhaustively and accurately assess all of their roads. This has led to a circumstance in which heavy vehicles with:

- as-of-right, general access (e.g. semi-trailers up to 19 m long and 42.5 t total mass) may operate on a given road, despite the road manager not having properly assessed that the road (or bridge) is suitable

- restricted access (e.g. B-double up to 26 m long) are denied access to the same road, as the road manager is unable to determine that it is suitable – even at a mass no more than semi-trailers already operating on it

The implication is that road managers are more conservative in how they assess restricted access heavy vehicles than those with as-of-right (general) access. Some officers have told us that they assess that their liability increases when they make a positive decision to approve access for a restricted access heavy vehicle. By contrast, they perceive liability from harm or damage resulting from the operation of an as-of-right heavy vehicle to rest more with laws and law-makers.

2.5 Differences between access requests made by the NHVR on their own and others' behalf

The NHVR is responsible for making all requests for road access by a restricted access heavy vehicle to the relevant road manager⁴. But they are usually assessed differently for those made by the NHVR as a request for:

- adding a road to a given heavy vehicle type's as-of-right, gazetted road network
- allowing an individual operator of one or a restricted number of heavy vehicles to access a given road – via permit

In its guideline for granting access, the NHVR (2014, p.14) recommends that:

When deciding whether access should be granted, the first consideration should be to either expand the routes under an existing notice, or issue a new notice.

Increasing as-of-right access by adding a road to a notice provides sustainable productivity improvements. This is because the increased access is made available to all operators, rather than just the one applying for permit access.

In section 2.1, we discussed how some state road managers are already giving access to heavy vehicles at acceptable mass limits – including where those limits are less than the standard maximum. But it is unclear how much of that access is being given via notice and how much via permit.

2.6 PBS vehicles are still not being given broad road network access

The PBS scheme offers a practical mechanism for supporting the broader use of heavy vehicles carrying an increased volume of freight, without increasing the applicable mass limits.

PBS is designed to allow access by more productive (larger) heavy vehicles, where applicants can demonstrate that the proposed vehicle meets the PBS safety standards. The standards are the most accurate, available means of assessing a heavy vehicle's capacity to safely operate on roads.

An example of where PBS vehicles have been denied broad road access is the PBS Level 1 network. It officially corresponds to access 'from passenger cars to single articulated [heavy vehicles]' and 'represents general access to the road network' (NHVR 2007, p. 2).

But only in Queensland has general access been granted to PBS Level 1 heavy vehicles. Even that access is only available via individual permits that require operators to specify the roads on which they propose to operate the vehicle. In practice, that is a more restrictive form of access than the as-of-right, general access for prescriptive heavy vehicles.

Victorian road managers have granted a significant degree of road access, but it is still restricted when compared with general access and only available via individual permit applications. In other states and territories, road access for PBS Level 1 heavy vehicles is relatively more restricted.

As a result, operators overwhelmingly choose to operate prescriptive heavy vehicles with more advantageous as-of-right, general access. This arrangement encourages choosing heavy vehicles that are assessed to lower safety standards and with lower productivity levels.

2.7 Current access arrangements for key heavy vehicle types

This paper describes options for the broader use of heavy vehicles carrying an increased volume of freight, without increasing the applicable mass limits. The key means by which governments may

⁴ Road managers may currently and ostensibly receive requests from state road agencies, but these are made under powers delegated by the NHVR.

encourage broader use of a given heavy vehicle type is by increasing its road access – i.e. by allowing a longer or higher vehicle to access a given road. This section describes current access arrangements for some relevant, selected heavy vehicle types.

Access for **PBS Level 1** heavy vehicles is described in section 2.6.

Road managers are progressively increasing access for **A- and B-doubles up to 30 m long**. Transport ministers agreed in November 2014 to assess key national freight routes for their capacity to accommodate these vehicles.

VicRoads has declared a road network for these vehicles approved to PBS standards which includes tiered access at different mass levels (i.e. consistent with principles of increasing volumetric load capacity – see section 2.1 for further discussion).

South Australia has the most extensive PBS Level 2b (30 m length limit) road network – it is a moderately limited version of its 26 m B-double network.

New South Wales does not yet have much access for these vehicles. However, it is assessing options for expanding their access and has granted limited access around port areas for higher productivity vehicles falling within this category.

Western Australia and the Northern Territory have extensive access for higher productivity heavy vehicles that encompass A-doubles and B-doubles up to 30 m long.

Road access for **B-triples and AB-triples** is relatively restricted. Access is restricted to non-metropolitan and remote roads in Queensland, New South Wales, South Australia, the Northern Territory and Western Australia.

Road access arrangements for **heavy vehicles up to 4.6 m high** vary between states and territories. A national gazettal notice (CofA 2014) makes the height limit conditional on:

- semi-trailers with height determined by construction only
- mass limit reduced to 90 per cent of the applicable general mass limit (GML) value
- semi-trailer deck height to be no greater than 1.2 m for at least 50 per cent of its deck length
- semi-trailers to be fitted with air suspension.

The notice applies in all jurisdictions except Tasmania and non-participants Western Australia and the Northern Territory. But applicable jurisdictions have also varied in how they have given road access, with the notice specifying:

- no road access restrictions in Victoria and Queensland
- operators are required to obtain permission from a telecommunications infrastructure manager for travel in central Adelaide (South Australia)
- travel is permitted in New South Wales and the ACT on approved roads only

Tasmania has its own requirements and allows the transport of shipping containers at up to 4.5 m total height, but not on dog trailers. No gazetted route restrictions apply.

No restrictions apply in the Northern Territory.

3 Discussion paper proposals and feedback

Key points

Stakeholders mostly supported, or did not oppose the proposed heavy vehicle types and dimensional increases.

Jurisdictions generally offered support for the proposals to increase road access for the proposed heavy vehicle types. Where as-of-right access was proposed, some jurisdictions preferred that expanded access be negotiated with local governments. Some were concerned about the capacity of longer rigid heavy vehicles to safely operate on the broader road network.

Some jurisdictions preferred that any increased road access resulting from the proposals made here be restricted to PBS-approved heavy vehicles.

There was general support for making operators and not road managers primarily responsible for determining safe road access of higher heavy vehicles (up to 4.6 m).

3.1 Proposed heavy vehicle types

The discussion paper described a number of heavy-vehicle-based options. These were heavy vehicle types that we assessed as most suitable to carry an increased volume of freight, without increasing the applicable mass limits. The heavy vehicle types are shown in Table 1.

Table 1. Proposed heavy vehicle types and dimension increases

Proposed heavy vehicle types	Proposed dimension increase	From	To
Longer rigid heavy vehicles	Length limit	12.5	20
Longer semi- and truck-trailers		19	20
Longer B-doubles		26	30
A-doubles replacing B-doubles			36.5
B-triples and AB-triples replacing B-doubles			
Height increase	Height limit	4.3	4.6

The proposed option increasing heavy vehicle height to 4.6 m was conditional on a vehicle meeting prescribed conditions:

- For heavy vehicles approved under the PBS safety standards:
 - With no additional conditions to be applied, specific to the 4.6m height limit
- For heavy vehicles not approved under the PBS safety standards:
 - semi-trailers with height determined by construction only
 - mass limit reduced to 90 per cent of the applicable general mass limit (GML) value
 - semi-trailer deck height to be no greater than 1.2 m for at least 50 per cent of its deck length
 - semi-trailers to be fitted with air suspension.

Stakeholder feedback and analysis

Stakeholders mostly supported, or did not oppose the proposed heavy vehicle types and dimensional increases. The proposed heavy vehicle types excluded consideration of the nature of road access they may be given. Agreeing with the vehicle types did not bind any party to making any changes to access arrangements.

Benefits

The proposed dimension increases to each heavy vehicle type provide potential productivity benefits. However, those benefits may only be realised if the vehicles are given sufficient road access. Access proposals are discussed in section 3.2.

3.2 Proposed, increased road access for heavy vehicle types

The discussion paper described preferred options for how each of the heavy vehicle types may be given increased road access. All of the proposed heavy vehicle types already operate on the roads to at least some degree. The productivity gains sought through this reform would be from increasing their road access. The preferred options for that are shown in Table 2.

Each road access option is described separately for PBS-approved and prescriptive (non-PBS) heavy vehicles. PBS heavy vehicles are those approved under the PBS scheme and safety standards. They vehicles have separately-designated road networks to their prescriptive counterparts. They are also assessed to a higher performance standard – with the intention that they may access a broader part of the road network than prescriptive heavy vehicles.

Prescriptive (non-PBS) heavy vehicles here are of similar dimensions and general configuration, but are not approved under the PBS scheme and safety standards.

Table 2. Road access options proposed in the discussion paper

Proposed heavy vehicle types	Proposed options for increased road access	
	Prescriptive variant of candidate heavy vehicle	PBS variant of candidate heavy vehicle
Longer rigid heavy vehicles	Existing access – limited	General access for PBS level 1 longer rigid heavy vehicles with a total mass no greater than existing, prescriptive variants (42.5 t).
Longer semi- and truck-trailers	Existing access – limited	General access for PBS level 1 longer semi- and truck-trailers with a total mass no greater than existing, prescriptive variants (42.5 t).
Longer A- and B-doubles	Assess only a restricted part of the 25/26 m B-double network for its suitability to accommodate 30 m A-doubles and B-doubles on high-value or strategic routes.	If the existing PBS level 2b network is insufficient, assess only a restricted part of the PBS level 2a road network for its suitability to PBS level 2-approved longer A-doubles and B-doubles.
	Assess the broader, existing 25/26 m B-double road network for its suitability to accommodate longer 30 m prescriptive A-doubles and B-doubles. Immediately grant access for 30 m prescriptive B-doubles to the 32-m-long road train network.	Assess the existing PBS level 2a network for suitability to be expanded to 2b. Immediately expand the PBS level 2b A and B-double network to encompass the 32-m-long road train network.
B-triples and AB-triples replacing B-doubles	Assess only a restricted part of the 25/26 m B-double network for its suitability to accommodate prescriptive, 36.5-m-long B-triples and AB-triples.	Assess only a restricted part of the PBS level 2a road network for its suitability to PBS level 3-approved 36.5-m-long B-triples and AB-triples.

	Grant the candidate prescriptive 36.5 m A-triples and B-triples the same road access as applies to type 1 36.5 m (double) road trains.	Extend the PBS level 3a road network to at least the roads to which type 1 36.5 m (double) road trains have been granted access (at mass levels no greater than those road trains).
Height increase	General access 'overlaid' on any other applicable road access restrictions. For example, a 4.6-m-high B-double under this option would still be restricted to applicable B-double routes.	

Stakeholder feedback and analysis

QTMR and VicRoads supported the proposal to give **longer PBS Level 1 rigid heavy vehicles** general access to the road network. Illustrations and details on the proposed length increases are shown in Figure 4 and Table 3.

TfNSW and the Tasmanian Department of State Growth offered in-principle support, but preferred that expanded access be negotiated with local governments. But the process of road managers assessing access on a road-by-road basis is inefficient – causing lengthy delays and is resource-intensive. The proposal would remove road managers' ability to assess (including to deny) access by these vehicles.

Figure 4. Length increases for rigid heavy vehicles to above 12.5 m and semi-trailers from 19 to 20 m.

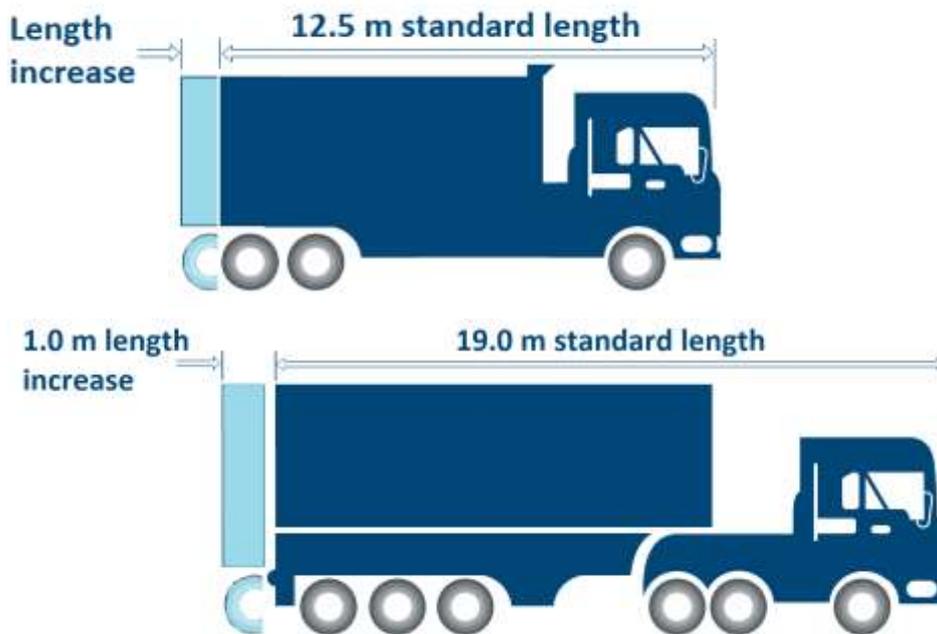


Table 3. Prescriptive and PBS Level 1 heavy vehicle length limits and road access levels

Heavy vehicle type	Prescriptive vehicle standards		PBS Level 1	
	Length limit	Road access	Length limit	Road access
Rigid	12.5 m	General access	20 m	Current: restricted access
Combination	19.0 m			Proposed: general access

TfNSW and ACT were concerned about the proposal to increase the maximum length of rigid heavy vehicles from 12.5 to 20 m. They were concerned that these vehicles may not be capable of safely operating on the broader road network.

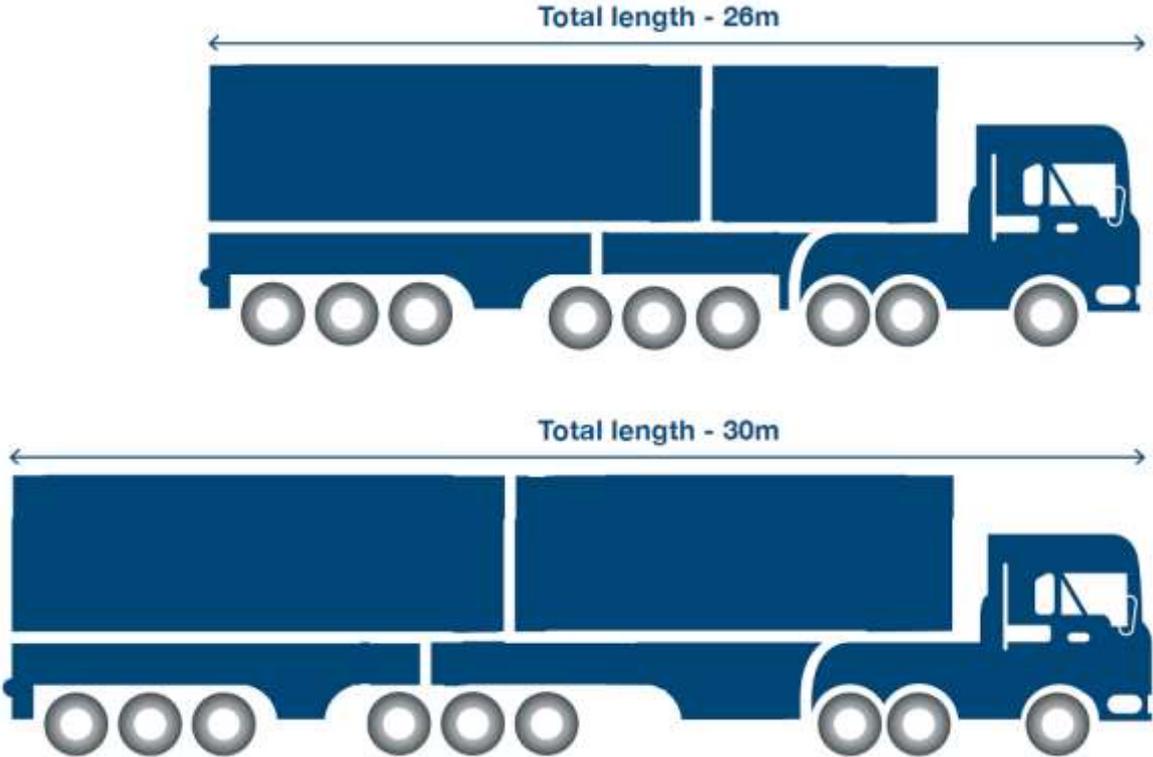
But the proposal is not to simply allow rigid heavy vehicles of up to 20 m length. Their length is practically limited by their need to be designed in a way that meets the PBS Level 1 safety standards. These standards determine a vehicle's ability to safely operate on the applicable roads. The onus is on applicants to develop their vehicle concept so that it meets the standards. A proposed vehicle design that fails to meet the PBS standards simply would not be approved. Most stakeholders accepted that the PBS standards were effective in serving that purpose.

There were fewer concerns for the proposal to give **longer PBS Level 1 semi- and truck-trailers** general access to the road network. The length increase of only 1 m would have a lesser effect than the proposal for longer rigid heavy vehicles. No jurisdictions objected to this proposal.

The proposals to increase access for **longer A- and B-doubles** were mostly supported in-principle. VicRoads and TfNSW restricted their support to only PBS-approved heavy vehicles. Queensland stated that their B-double road network would not fully accommodate longer A- and B-doubles – although this is acknowledged in our proposal. Tasmania stated the same and that they were planning network upgrades to improve access for these vehicles.

An illustration of a longer (30 m) B-double is shown in Figure 5.

Figure 5. A standard 26 m B-double compared with a 30 m B-double.



State and territory governments are already working to increase access on key freight networks. Some of that work was considered by transport ministers at their meeting in November 2014, where the publication of Australia's key freight routes was tabled. At the same time, ministers agreed to increase access for higher productivity heavy vehicles under principles consistent with the PBS standards and scheme (Transport and Infrastructure Council 2014).

State and territory governments' feedback on our proposal to increase access for longer A- and B-doubles was mostly consistent with that November 2014 agreement by ministers. Some road agencies stated they had already made significant progress on developing PBS Level 2b road networks (for 30 m A-doubles and B-doubles).

However, ministers were not asked to consider principles or outcomes specific to increasing heavy vehicle volumetric load capacity. Increasing access for longer A- and B-doubles at standard mass limits has benefits in its own right, but are not the increased access and benefits proposed in this paper. VicRoads was the only road agency to describe having implemented a high productivity

heavy vehicle road network consistent with the principles and objectives of this paper. That network includes tiered access for heavy vehicle types at different mass limits.

There was limited support for the option of **B-triples and AB-triples replacing B-doubles**. QTMR stated that roads approved for B-doubles were generally not suitable for larger B-triples and AB-triples, due to factors such as narrower lane widths.

There was support for the option to **increase heavy vehicle height**. States including Victoria and Queensland had already implemented the proposal. The predominant view of road agencies and managers was that more clearly making operators responsible for assessing the overhead clearance of their vehicles would better clarify their responsibilities and liabilities.

TfNSW and the ACT Government were concerned about the potential for increased numbers of collisions with overhead hazards. The proposal has not been implemented in those jurisdictions, where access for higher (up to 4.6 m-high) heavy vehicles is on approved roads only.

TfNSW stated that if the proposal were adopted, they would need an opportunity to transition from their existing approach of approving roads to the proposed one.

Benefits

General benefits (for all of the road access options) include:

- Fewer heavy vehicles on the roads, due to productivity gains resulting from using longer and higher heavy vehicles.
- Increased safety of road users - where longer and higher heavy vehicles are assessed to the higher PBS safety standards than the prescriptive vehicles they would replace.

Benefits of **longer PBS Level 1 heavy vehicles** (rigids, semi- and truck trailers) being given as-of-right, general access to the road network:

- productivity increases for rigid heavy vehicles longer than 12.5 m, depending on how much longer they are
 - 2 m could reduce rigid heavy vehicle numbers from about 70,000 by up to 7 per cent, or 5,000 vehicles⁵
 - 1 m could reduce semi-trailer numbers from about 55,000 by up to 3.4 per cent, or 1,900 vehicles.⁶
- a productivity increase of 8 per cent for a 1 m increase in total length (from 19 to 20 m) for a semi- or truck-trailer (NTC 2016a)
- less red tape for heavy vehicle operators gaining approval to operate PBS Level 1 heavy vehicles.
- resources of road managers and the NHVR being freed up by not having to assess individual applications for PBS Level 1 heavy vehicles.

A potential disadvantage of longer PBS Level 1 heavy vehicles is the cost to operators of having their heavy vehicle approved to the PBS standards. This cost can be several thousand dollars, but can be reduced if a single approval is used for multiple vehicles.

The key benefit of the proposal for **longer A- and B-doubles** was that increasing vehicle length by 4 m to 30 m could reduce B-double numbers from about 22,500 by up to 7.6 per cent, or 1,700 vehicles.⁷ The estimated savings in vehicle operating costs of these reductions are over \$1 billion .

The freight industry and governments have increasingly identified 30 m A- and B-double combinations as a safe and productive substitute for 26 m B-doubles. Implementing this proposal would help maximise their road access, by better managing circumstances in which the default maximum mass of these vehicles was an access barrier.

The benefits of 30 m A- and B-doubles extend beyond line haul freight on key networks. One application has been transporting shipping containers between ports and container yards. This task

⁵ Based on the size of the national fleet of (larger) 3, 4 and 5 axle rigid vehicle numbers only.

⁶ Based on the size of the national fleet of semi-trailers with 2 and 3 axle prime movers only.

⁷ Based on the size of the national fleet of 9 axle B-doubles only.

frequently requires access to heavily trafficked, urban roads and has been resisted by some residents.

- A- and B-doubles that are 30 m long can generally carry two 40-foot containers, while 26 m B-doubles can carry just one.
- NTC assessments concluded that a 30 per cent increase in productivity was possible with 30 m A- and B-doubles carrying general freight. This potentially means substituting up to every 3 trips made by existing 26 m B-doubles with two trips by longer, 30 m vehicles.

Implementing the proposal could predominantly be supported by road agencies within their existing work programs to assess access for 30 m A- and B-doubles

The key benefit of **increase heavy vehicle height** is the greater productivity from broader road access and use of these vehicles. Another benefit is a clearer responsibility on operators to assess their vehicle would clear overhead hazards on given roads. Failing to conduct this assessment is a common reason why operators currently strike overhead hazards.

It is difficult to quantify the benefits of this proposal. Industry feedback is that adoption would be restricted to operators with a specific need for 4.6 m-high heavy vehicles. This need would likely be associated with transporting freight types that needed the additional 0.3 m of height to fit into a vehicle.

3.3 Proposed implementation options

Preferred options for making legislative changes were to amend the HVNL to:

- grant general access to heavy vehicles approved under the PBS scheme to level 1 standards
- authorise the NHVR to grant road access to heavy vehicles of a type to which a road manager has effectively, but not formally, already consented.

The **preferred option for identifying roads to assess** was for the NHVR and road authorities to coordinate assessments and report to ministers. This gives the NHVR and road authorities responsibility for planning and coordinating how road managers would assess roads. State or territory road authorities would be responsible for:

- developing a plan for how to conduct road assessments in their state or territory
- incorporating within that plan steps to engage with local road managers to incorporate local road assessments
- plans for how they would engage with other stakeholders – for example, industry members – as necessary.

The NHVR would be responsible for coordinating the plans of state or territory road authorities to maximise nationally seamless road access for heavy vehicles with increased volumetric load capacity.

The NHVR and state and territory road authorities would submit their plans for the consideration of ministers and periodically report back on progress with implementation.

The **preferred option for standardising road access assessment approaches** was to develop standardised road assessment and reporting criteria.

The **preferred heavy vehicle standards option** was to develop a policy for utilising both PBS and prescriptive standards. Under this option, the NHVR would work with road managers and industry members to develop a policy guiding the consistent application of PBS and prescriptive standards to heavy vehicles with increased volumetric load capacity.

The **preferred option for terms of access** was to progressively transition from permit to as-of-right access. Under this option, the NHVR would work with road managers towards progressively granting as-of-right access to heavy vehicles with increased volumetric load capacity under gazettal notice. Access may initially be granted under permit-based trials, as necessary to accumulate sufficient data to determine consent under gazettal notice.

Stakeholder feedback and analysis

The proposal to **make legislative changes** give general access to PBS Level 1 heavy vehicles was discussed in section 3.2. While some jurisdictions and road managers would prefer to retain existing arrangements, this proposal can only be implemented by removing the current administrative barriers that require operators to apply for permits.

There was mixed support for **making legislative changes** authorising the NHVR to grant road access without the formal consent of road managers and in limited circumstances. TfNSW were concerned that the proposal would mean 'by-passing' local road managers – who they believed needed to be part of the decision-making process. VicRoads supported the proposal in-principle, but also emphasised the need to consult with local governments.

QTMR stated that the standards used in the past to give access to prescriptive heavy vehicles were no longer current. Because PBS is a newer scheme and applies higher standards, QTMR did not support automatically giving PBS vehicles access to roads approved for prescriptive ones. Other jurisdictions have made similar statements to the NTC.

The notion of progressively increasing access standards seems justified. But in practice no increase is achieved when the lower standards of the past are left in place for prescriptive vehicles. Jurisdictions generally supported the proposal **for identifying roads to assess** that the NHVR and road authorities coordinate assessments and report to ministers. TfNSW stated their belief that the task was the 'primary (and collective) responsibility of road managers, with support from the NHVR'.

No jurisdiction opposed the proposal **for standardising road access assessment approaches**, with VicRoads and TfNSW supporting it and others not responding. However, discussion with jurisdictional officers revealed to us that they may have interpreted the proposal differently than how we intended.

Officers mostly saw the proposal as presenting standards to guide how assessments should be conducted and that these already existed to some degree – e.g. the online RAVRAT⁸. But the proposal was as much about encouraging more consistent and systematic recording and disclosure of road assessment data. This was intended to assist with better identifying precise barriers to access and supporting more informed discussions between stakeholders in resolving them.

VicRoads and TfNSW offered support for the proposed **heavy vehicle standards option** to develop a policy for utilising both PBS and prescriptive standards. But their support was for such a policy to uniformly apply PBS standards (at least for heavy vehicles carrying an increased volume of freight, without increasing the applicable mass limits).

This is not what we intended such a policy may recommend. Heavy vehicles that are not assessed to and some of which do not meet PBS standards operate in all jurisdictions. These include new and older prescriptive heavy vehicles. This paper proposes options for road managers to give access to heavy vehicles at less than standard mass limits where the standard mass is a constraint. It is unjustified to consider giving access to a heavy vehicle at standard mass limits under prescriptive vehicle standards, but require that the same vehicle meet the higher PBS standards at lower mass limits.

Jurisdictions supported this proposed **option for terms of access** - to progressively transition increases in access from permit to as-of-right access.

⁸ The Restricted Access Vehicle Route Assessment Tool (RAVRAT) is an online tool that was developed and made available to assist road managers in conducting practical assessments of heavy vehicle access.

4 Conclusions and recommendations

Key points

We recommended that **longer PBS Level 1 heavy vehicles** be given as-of-right, general access. We assessed the potential benefits at about \$0.5 billion and resulting from about 5,000 less rigid heavy vehicles needed if their length could be increased by 2 m.

We recommended guiding principles to better clarify how the NHVR and road managers should conduct access assessments to best support volumetric principles.

We recommended increasing road access for **longer A- and B-doubles**. We assessed that broad road access had a potential benefit of \$1 billion, resulting from about 1,700 fewer B-doubles needed to transport the same amount of freight.

We recommended amending the HVNL to make operators and not road managers primarily responsible for determining safe road access of **higher heavy vehicles** (up to 4.6 m).

We recommended amending the HVNL to require that road managers specify an acceptable mass limit, rather than denying a heavy vehicle access at the standard one.

4.1 Heavy vehicle types

The principle of increasing road access for heavy vehicles carrying an increased volume of freight, without increasing the applicable mass limits can apply to all restricted access heavy vehicles.

The specific heavy vehicle types we proposed were those we assessed as most suitable. They were suitable because they had been given lesser road access than was possible, including by reducing their mass limits.

All of the proposed vehicle types were supported, although there was less support for **B-triples and AB-triples replacing B-doubles** than other types.

Recommendations for the proposed heavy vehicle types are made in section 4.2.

4.2 Increased road access for heavy vehicle types

We assessed that the benefits of giving as-of-right, general access to **longer PBS Level 1 heavy vehicles** substantially outweighed the costs. We assessed the potential benefits at about \$0.5 billion and resulting from about 5,000 less rigid heavy vehicles needed if their length could be increased by 2 m.

We acknowledge that some jurisdictions are concerned that the proposal meant road managers would no longer be responsible for consenting to access by longer PBS Level 1 heavy vehicles. However, we assessed that for these vehicles, consent is unnecessarily consuming limited government and industry resources. PBS Level 1 vehicles are assessed to higher safety standards than prescriptive vehicles that have never needed road manager consent.

Recommendation 1: General access for PBS Level 1 heavy vehicles

Amend the HVNL to grant PBS Level 1 heavy vehicles as-of-right, general access to the road network at up to the same mass limits as other heavy vehicles already operating under the same as-of-right, general access conditions.

We assessed that broad road access for **longer A- and B-doubles** had a potential benefit of \$1 billion, resulting from about 1,700 fewer B-doubles needed to transport the same amount of freight.

Jurisdictions supported the discussion paper proposal and noted their ongoing work in assessing options for increasing the road access of longer A- and B-doubles. But the benefits of this proposal would only be achieved by assessing that access in a way that supports heavy vehicles carrying an increased volume of freight, without increasing the applicable mass limits.

Broader feedback by jurisdictions revealed some differing interpretations of how to conduct access assessments that support volumetric principles. To better clarify that, we developed some guiding principles for their consistent application.

The overarching, guiding principle is to grant increased road access to heavy vehicles with increased volumetric load capacity, but no mass increase.

Supporting guiding principles are:

- **No reduction in safety.** This principle is achieved by road managers in how they consent to road access by heavy vehicles with an increased volumetric load capacity. Road managers are responsible for assessing whether access by a given heavy vehicle to a given road would be safe.
- **No increase in mass.** In this context, a mass increase is measured relative to a given length of road. A heavy vehicle with increased volumetric load capacity would be permitted to operate on a given road under the same mass limits as another (smaller) heavy vehicle on that road.
- **No need to re-assess vertical loading impact.** Under the principle of being granted no increase in mass, there is no need for a road manager to re-assess the vertical loading impact of a heavy vehicle with increased volumetric load capacity.
- **Develop a tiered volumetric road network.** Increasing road access for heavy vehicles with increased volumetric load capacity means developing road networks for a given heavy vehicle type at multiple, tiered mass limits.
- **Only assess relevant on-road performance criteria.** Increasing the volumetric load capacity of a heavy vehicle does not affect all on-road performance criteria. Unaffected criteria should be neglected for the purpose of a road manager determining whether to consent to its accessing a given road.
- **Focus on utilising existing, standard heavy vehicle configurations.** Increasing the volumetric load capacity of a heavy vehicle on a given road will yield a more practical outcome if it supports the use of an existing, standard heavy vehicle configuration.
- **Road infrastructure constraints to guide how volumetric road networks are developed.** An underlying principle is to grant increased access to heavy vehicles with an increased volumetric load capacity, where vertical loading impact (mass) is an access constraint. A key part of increasing access for these heavy vehicles is identifying circumstances (roads and their locations) where that type of constraint exist.

Recommendation 2: Guiding principles

The NHVR and road managers adopt the guiding principles for increasing allowed volume where mass is not the constraint.

While jurisdictions supported increasing the road access of longer A- and B-doubles, they were more mixed in their support for the types of roads to which we proposed they extend access. We have amended the proposal to delegate more responsibility to jurisdictions for identifying which roads are most suitable for increasing access to longer A- and B-doubles.

Recommendation 3: Incorporate the guiding principles in developing road networks for heavy vehicles of up to 30 m total length

That state and territory governments incorporate the guiding principles for increasing volumetric load capacity in identifying suitable road networks for 30m A-doubles and B-doubles.

Due to lesser support by jurisdictions for the proposal to increase access for **B-triples and AB-triples replacing B-doubles**, we have not made any specific recommendations for increasing their access. As for all heavy vehicle types, the NHVR and road managers may still apply the guiding principles to these vehicle types as and where appropriate.

There was broad support for the proposal to make operators of **higher heavy vehicles** (up to 4.6 m) more responsible for determining safe road access. The NTC believes that the process of developing legislative amendments would provide TfNSW with adequate opportunity to transition from their existing approach of approving roads to the proposed one.

Recommendation 4: Operators to determine suitable access for heavy vehicles up to 4.6 m in height.

That heavy vehicles up to a maximum height of 4.6 m be permitted to operate:

- (a) With any and all standing conditions and road access restrictions continuing to apply to the heavy vehicle, but excluding any conditions and road access restrictions currently applied as a condition of the heavy vehicle exceeding 4.3m total height*
- (b) For heavy vehicles approved under the PBS safety standards:*
 - a. With no additional conditions to be applied, specific to the 4.6m height limit*
- (c) For semi-trailers with dimensions measured by construction only and not approved under the PBS safety standards, with the:*
 - a. heavy vehicle mass limit reduced to 90 per cent of the applicable general mass limit (GML) value*
 - b. semi-trailer deck height to be no greater than 1.2 m for at least 50 per cent of its deck length*
 - c. semi-trailers to be fitted with air suspension*

Amend the HVNL to give effect to the height increase for semi-trailers not approved under the PBS safety standards and incorporating the conditions as prescribed in these recommendations.

4.3 Implementation options

Preferred options for making legislative changes were to amend the HVNL to:

- grant general access to heavy vehicles approved under the PBS scheme to level 1 standards
- authorise the NHVR to grant road access to heavy vehicles of a type to which a road manager has effectively, but not formally, already consented.

The preferred option to amend the HVNL to grant general access to PBS Level 1 heavy vehicles is addressed by Recommendation 1 in section 4.2.

We have not made any recommendation for amending the HVNL to grant road access to heavy vehicles of a type to which a road manager has effectively, but not formally, already consented. Jurisdictions were concerned that this matter required more careful consideration than was practical within the scope of this reform and paper.

There is compelling evidence of what could be an identical heavy vehicle approved under the PBS and prescriptive vehicle standards, that would be given reduced road access under the higher PBS standards. But we will address this issue as part of the PBS Marketplace project.

The **preferred option for identifying roads to assess** was for the NHVR and road authorities to coordinate assessments and report to ministers. There was broad support for this option, which is addressed in section 5 Implementation.

The **preferred option for standardising road access assessment approaches** was to develop standardised road assessment and reporting criteria. While there was in-principle support for the proposal, we concluded from stakeholder discussions that a challenge would be influencing road managers to adopt the criteria. We assessed the magnitude of that challenge as substantial, due to the large number (560) of local government road managers.

We have addressed the need for developing standardised guidelines in section 5.3 Communicating changes and providing training. But we concluded that a more effective means of influencing road managers to adopt the key principles proposed in this paper would be to amend the HVNL requirements for how they may respond to an access request.

In particular, we concluded that there was no reason why a road manager should deny a heavy vehicle access, due to road infrastructure damage associated with the vehicle's proposed mass.

Rather, the principles as proposed in this paper and broadly supported by stakeholders would mean that a road manager would prescribe an acceptable mass limit.

Recommendation 5: Separate road access consent for heavy vehicles and applicable mass limits

Amend the HVNL to allow the NHVR to require a road manager to respond to a road access request by consenting to mass limits they have assessed would not damage road infrastructure.

The **preferred heavy vehicle standards option** was to develop a policy for utilising both PBS and prescriptive standards. This proposal received mixed support from jurisdictions. We intended the proposal to address the practice of a road manager granting access in one circumstance to heavy vehicles under prescriptive standards and PBS in another.

Some jurisdictions proposed tying any policy of increasing road access for heavy vehicles carrying an increased volume of freight, without increasing the applicable mass limits, to PBS-approved vehicles only. But that would preclude road managers from applying the policy to any of the large range of heavy vehicles already operating under prescriptive standards. We see no justification for restricting the policy's potential benefits in that way.

Due to the complexities and different views on this issue, we have not made any associated recommendations in this paper.

The **preferred option for terms of access** was to progressively transition from permit to as-of-right access. This proposal received strong support from jurisdictions. We have recommended that responsibility for implementing the recommendations be delegated to the NHVR and jurisdictions. As they may still choose to give as-of-right access without any transition period, the proposal does not bind them to any outcome. There is no need for and we have not made any formal recommendations.

5 Implementation

Key points

Legislative amendments would be required to implement the recommendations in this paper. Road managers would need to assess roads under the guiding principles that are recommended. Guidance material and communication of changes to stakeholders would be required.

5.1 Legislative amendments

Legislative amendments would need to be developed to implement:

- Recommendation 5: Separate road access consent for heavy vehicles and applicable mass limits
- Recommendation 1: General access for PBS Level 1 heavy vehicles
- Recommendation 4: Operators to determine suitable access for heavy vehicles up to 4.6 metres in height

Lead agencies:

- NTC (drafting instructions)
- Queensland Office of Parliamentary Counsel (drafting amendments)

Deliverable:

- Legislative amendments

Timelines:

- Subject to ministerial agreement to recommendations in this policy paper, the NTC would prepare a draft Bill to amend the HVNL for consideration in late 2017.
- Following ministerial consideration of the draft Bill, and if agreed, the amending Bill would likely be considered by the Queensland Parliament (as host jurisdiction for the HVNL) in early 2018, with adoption of the amendments by other jurisdictions party to the HVNL to follow.

5.2 Road assessments for restricted access heavy vehicles

Two types of road assessments are recommended in this paper:

- Recommendation 5 is to amend the HVNL, requiring that a road manager respond to a road access request by the NHVR by consenting to mass limits at which they assessed would not damage road infrastructure.
- Recommendation 3 is for state and territory road agencies, and the NHVR to assess and declare road networks for A- and B-doubles up to 30 m in length.

Implementation here refers to the discrete task of developing specific road networks under Recommendation 3 only. Recommendation 2 would require road managers to change how they respond to access requests - its implementation is addressed separately in 5.3 below

Responsibility would be with state and territory road agencies, and the NHVR to develop plans for how they would conduct road assessments. We recommend that the NHVR report to Council on those plans on behalf of road agencies and then periodically on their implementation status.

Lead agencies:

- NHVR
- State and territory road agencies.

Deliverables:

- Plans by each state and territory road agency for assessing road access under guiding principles for heavy vehicles with increased volumetric load capacity
- Progress results of those road access assessments

- Gazetted increases in road access under HVNL.

Timelines:

- State and territory road agencies to develop plans at a state / territory level, in consultation with the NHVR, for assessing roads as part of volumetric road network
- NHVR to report plans to TISOC / Ministers for consideration at 2nd round of meetings 2017.

5.3 Communicating changes and providing training

Recommendation 2 is for legislative amendments requiring road managers to change how they assess and respond to heavy vehicle road access requests. Effectively implementing the recommendation would require communication to road managers and some training on the nature of the changes.

Lead agency:

- NHVR.

Deliverables:

- Published training materials and training workshops as necessary.

Timelines:

- Communication and delivery of training before the legislative requirements commence, which is anticipated to be mid-2018 at the earliest.

5.4 Publishing volumetric road networks

Developing volumetric road networks that vary with heavy vehicle mass includes publishing them. The preferred medium for this type of publication is increasingly online, such as with the NHVR's Journey Planner.

The task of updating publications to reflect increases and changes to road networks resulting from road assessments recommended in this paper can likely be absorbed within existing processes. However, any changes to online functionality needed to allow publishing volumetric networks would need to be addressed before they start being published.

Lead agency:

- NHVR.

Deliverables:

- Published volumetric road networks.

Timelines:

- To be determined by the NHVR.

Appendix: Assumptions made in assessing recommendation benefits

We assessed how some of the recommendations in this paper would affect composition of the heavy vehicle fleet and their aggregate distance travelled on the roads. We were able to assess only the recommendations for replacing one heavy vehicle type with an incrementally larger one.

Our assessments used the following data:

- numbers of registered heavy vehicle types in Australia – sourced from state and territory registration records from 2015/16
- average annual distances travelled in Australia – sourced from Australian Bureau of Statistics Survey of Motor Vehicle Usage (SMVU) data, for each heavy vehicle type:
 - in total, and
 - by type of commodity being transported.

We estimated which variants of a given heavy vehicle type may be volume-constrained. We did this by reasoning that only the larger variants were likely to be volume-constrained. Operators of smaller variants already have the option to procure a larger heavy vehicle. That they have not taken that option likely indicates a constraint that would apply regardless of whether the recommendations in this paper were implemented.

An example of such a constraint is an operator transporting small freight quantities (e.g. an ancillary operator transporting their own goods in limited quantities).

We estimated the number of those volume-constrained heavy vehicles that were transporting volume-constrained freight. SMVU data categorises those heavy vehicle types by the predominant commodity type they are used to transport. We estimated that categories such as manufactured goods were likely to be of low density and volume-constrained, while other higher density ones such as bulk liquids were not.

From these two estimates, we were able to assess:

- The total number of a given heavy vehicle type, and its average and aggregate distance travelled per annum, and
- The number for that vehicle type being used to transport volume-constrained loads.

Each recommendation was for the size of a given heavy vehicle type to be increased. From that size increase we estimated the associated increase in freight quantity. From that unit vehicle increase, we estimated the number of heavy vehicles and distance travelled needed to transport the same total freight quantity.

These reductions in heavy vehicle numbers (assuming the average distance travelled per annum remained constant) and aggregate distance travelled are two of the key benefits of this reform.

We used the NTC's PAYGO heavy vehicle operating cost calculator to assess the financial effects of those reductions in heavy vehicle operation.

5.5 Recommendation 1: General access for PBS Level 1 heavy vehicles

Rigid heavy vehicles

We assessed the relevant rigid heavy vehicle types to be:

- 3 axle rigid truck GVM greater than 16.5 tonnes
- 4 axle rigid truck GVM greater than 20 tonnes
- 5 axle rigid truck GVM greater than 20 tonnes

These are the larger rigid heavy vehicles. Smaller rigid heavy vehicles were likely chosen by operators for reasons that meant they were not volume-constrained.

The recommendation was to increase the current 12.5 m length limit for rigid heavy vehicles to a length limit of 20 m. The 20 m limit is an outer limit – in practice rigid heavy vehicles would almost certainly need to be built with a shorter length to meet the PBS safety standards.

We assumed a length increase of 2 m for rigid heavy vehicles – i.e. from 12.5 to 14.5 m. We assessed that this meant a 20 per cent increase in productivity (freight quantity).

Articulated heavy vehicles

We assessed the relevant articulated heavy vehicle types to be:

- Short combination prime mover with 2 axles
- Short combination prime mover with 3 axles

These are semi-trailer combinations. We assessed that truck-trailer combinations were not volume-constrained, as they are predominantly used to transport higher density freight such as dirt and quarry products.

The recommendation was to increase the current 19 m length limit for articulated heavy vehicles to 20 m for those meeting the PBS safety standards. We assessed that this meant a 10 per cent increase in productivity (freight quantity).

5.6 Recommendations 3: Heavy vehicles of up to 30 m total length

We assessed that A- and B-doubles of up to 30 m in length would replace B-doubles of up to 26 m length and with at least 9 axles. B-doubles with less than 9 axles are predominantly smaller in size and used to access confined areas, such as fuel deliveries to service stations. They are not volume-constrained.

The recommendation was to increase the current 26 m length limit for B-doubles to 30 m for A- and B-doubles. We assessed that this meant a 32 per cent increase in productivity (freight quantity).

5.7 Assumption limitations

The assumptions we made in assessing the effects of each recommendation are subject to limitations that affect their accuracy.

The selection of heavy vehicle variants that may transport volume-constrained freight was conservative. The availability of the PBS safety standards allows for more innovative heavy vehicle designs that would support increasing the size of smaller heavy vehicles while maintaining their manoeuvrability. We discounted these vehicles in our assessments.

The estimates of commodity types that are volume-constrained were subject to uncertainty. The commodity types quoted in the SMVU are broad classifications, encompassing commodities of varying densities. While a proportion of the commodities we selected would inevitably not be volume-constrained, this is offset by the reverse – that some we de-selected would be. We have no practicably available means of assessing the accuracy of these estimates.

Another limitation is the rate of adoption for volumetrically-increased heavy vehicles. For some operators, procuring new heavy vehicle stock is unaffordable and they would continue operating their existing heavy vehicles. Road access restrictions are a key limiting factor – the more access made available to a given heavy vehicle type, the greater the rate of adoption by operators.

The estimates we have included in this paper are estimates of the benefits associated with uniform adoption of the recommended heavy vehicle types (for volume-constrained transport operations only). They are the benefits that would result from widespread implementation of the recommendations by governments – which is what we have recommended. As adoption rates in even ideal circumstance would inevitably be less than uniform, this assumption would tend to overstate the true benefits.

The estimates are made only for the specific heavy vehicle types we referenced in this paper. Those were the vehicles we assessed that the recommendations were most practicably applied. But the guiding principles apply to any and all heavy vehicle types. The aggregate benefits we assessed in this paper exclude those and in that way are conservative.

6 References

Commonwealth of Australia (CofA) 2014, *Heavy vehicle national law: National class 3 heavy vehicle 4.6m high by construction: Semitrailer dimension exemption (notice) 2014 (no. 1)*, viewed 4 April 2017, <<https://www.nhvr.gov.au/files/c2014g00235-national-class-3-4-6m-construction-semitrailer.pdf>>.

National Heavy Vehicle Regulator (NHVR) 2007, *Performance-Based Standards Scheme – Network Classification Guidelines July 2007*, NHVR, Brisbane.

National Heavy Vehicle Regulator (NHVR) 2015, *Approved Guidelines for Granting Access*, <<https://www.nhvr.gov.au/files/nhvr0141-1-201402-approved-guidelines-for-granting-access.pdf>>

National Heavy Vehicle Regulator (NHVR) 2016, *Heavy Vehicle National Law (Queensland) February 2016*, NHVR, Brisbane.

National Transport Commission (NTC) 2016a, *Increasing heavy vehicle volumetric load capacity without increasing mass limits – Issues paper*, viewed 2 March 2017, <[http://www.ntc.gov.au/Media/Reports/\(E4F14442-0D55-4829-B904-8B5D9BC7B915\).pdf](http://www.ntc.gov.au/Media/Reports/(E4F14442-0D55-4829-B904-8B5D9BC7B915).pdf)>.

National Transport Commission (NTC) 2016b, *Increasing heavy vehicle volumetric load capacity without increasing mass limits – Discussion paper*, viewed 2 March 2017, <[http://ntc.gov.au/Media/Reports/\(6805FC2D-66DC-4B1C-C715-E034D3817C51\).pdf](http://ntc.gov.au/Media/Reports/(6805FC2D-66DC-4B1C-C715-E034D3817C51).pdf)>.

Transport and Infrastructure Council 2014, *Communiqué – Launceston, Friday, 7 November 2014*, viewed 10 April 2017,

<http://transportinfrastructurecouncil.gov.au/communiqué/files/Council_2nd_Communique_7_November_2014_FINAL.pdf>