Austroads

Research Report
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Local Road Access for High Productivity Freight Vehicles

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Abstract

This report examines the status of Australia's municipal Performance Based Standards (PBS) networks and the challenges of providing access to High Productivity Freight Vehicles (HPFV) on local roads.

The many challenges local road managers face when assessing roads for HPFV access are impeding Australia's progression towards safer and more efficient road freight transport.

A comprehensive outline of the contemporary barriers to local road access was compiled following an intensive consultation process including face-to-face interviews with more than 40 professionals from state road authorities, local government associations, local councils, transport industry associations, transport companies and other government agencies, and an online stakeholder survey.

Real-life case studies were compiled to demonstrate how some road managers have overcome concerns about swept path width, intersection clearance time, route compliance, increased infrastructure consumption, bridge loading and stakeholder acceptance to ultimately provide access where it was warranted.

Ten recommendations for further investigation are presented, focusing on education, funding needs, legislative change, appeals processes, cost recovery frameworks and route assessment guidelines and tools.

Keywords

High Productivity Freight Vehicles, HPFV, Performance Based Standards, PBS, access, local roads

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About Austroads

Austroads is the peak organisation of Australasian road transport and traffic agencies.

Austroads' purpose is to support our member organisations to deliver an improved Australasian road transport network. To succeed in this task, we undertake leading-edge road and transport research which underpins our input to policy development and published guidance on the design, construction and management of the road network and its associated infrastructure.

Austroads provides a collective approach that delivers value for money, encourages shared knowledge and drives consistency for road users.

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- Roads and Maritime Services New South Wales
- Roads Corporation Victoria
- Queensland Department of Transport and Main Roads
- Main Roads Western Australia
- Department of Planning, Transport and Infrastructure South Australia
- Department of State Growth Tasmania
- Department of Infrastructure, Planning and Logistics Northern Territory
- Transport Canberra and City Services Directorate, Australian Capital Territory
- Australian Government Department of Infrastructure, Regional Development and Cities
- Australian Local Government Association
- New Zealand Transport Agency.

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Summary

It is a unique challenge for road managers to approve road access for High Productivity Freight Vehicles. Typically a product of the Performance Based Standards Scheme, the larger and heavier road freight vehicles of today have the potential to exceed the geometric and structural capacity of our road system. More often than not, however, barriers to access approval for these vehicles have no basis in infrastructure capacity. Regardless of their basis, barriers must be identified and overcome if Australia's world-leading progression towards safer and more efficient road freight transport is to continue.

Local road managers are subject to specific challenges not faced by their state and territory counterparts. Those challenges were perhaps not sufficiently recognised and acknowledged by those who developed and promoted the Performance Based Standards Scheme over the past two decades. This, coupled with the importance of local road access to many transport tasks, puts the challenges currently faced by local road managers front and centre in this research.

Through various stakeholder consultations, an outline of the contemporary barriers to local road access was compiled. The findings of face-to-face interviews with more than 40 professionals from state road authorities, local government associations, local councils, transport industry associations, transport companies and other government agencies were combined with those of an online stakeholder survey to produce a discussion of the barriers to Australia's High Productivity Freight Vehicles.

While infrastructure capacity constraints do feature among the barriers, the vast majority of barriers were found to stem from road managers' incomplete understanding of Performance Based Standards, resource shortages, and areas for improvement in the Heavy Vehicle National Law.

Seven real-life case studies were compiled to demonstrate how some road managers overcame concerns about swept path width, intersection clearance time, route compliance, increased infrastructure consumption, bridge loading and stakeholder acceptance to ultimately provide access where it was due.

Ten recommendations for further investigation are presented, focusing on education, funding needs, legislative change, appeals processes, cost recovery frameworks and route assessment guidelines and tools.

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1. Introduction

Roads managed by local councils provide necessary links between state-managed highways and some freight origins and destinations such as silos, sale yards, rail heads, distribution centres, industrial parks and depots. These local roads—colloquially known as 'the last mile'—may lack the geometric or structural capacity to accommodate longer and/or heavier truck configurations that are now being approved under the national Performance Based Standards (PBS) Scheme. By virtue of their increased carrying capacity, PBS-approved vehicle configurations are often referred to as High Productivity Freight Vehicles (HPFVs).[1]

The inability of some local roads to accommodate HPFVs means that the safest and most efficient freight transport solution is not always possible. To-date, neither transport planning nor land use planning has effectively delivered complete freight routes that extend from origin to destination. This is exacerbated by roads being under the control of different road managers with different priorities. As a result, local roads that form the first or last portion of a freight route may not be designed for access by HPFVs.

It can be difficult for local governments to balance the needs of the different users of local roads. Freight movement on local roads can have a detrimental impact on the amenity of an area; an area normally used for local shopping or children attending school can be compromised by the noise and air pollution associated with truck traffic.

First and last mile issues manifest where the level of access is lower than that available on nearby freight routes. For example, local governments may refuse to give consent for HPFVs to access their local roads for a number of reasons, including:

- wear caused by heavy vehicles that cannot be addressed without additional funding, and the difficulties involved in obtaining that funding from the usual local government funding sources
- concerns about the amenity impacts of noise and air pollution, hours of operation, and the general safety implications of heavy vehicles in residential areas
- access being limited to off-peak periods which may not meet the supply and demand conditions of deliveries
- insufficient knowledge and expertise to assess the impact of various mass and dimension scenarios
- insufficient capability within local government to assess bridges and road design matters, such as turning paths to accommodate longer vehicles
- an inability to safely accommodate these vehicles on current road infrastructure
- providing sufficient evidence to meet the criteria of the NHVR to refuse access including possible damage to infrastructure, the environment and a threat to road safety when tools and knowledge are low or non-existent.

This report presents the findings of stakeholder consultation aimed at identifying the barriers to local road access for HPFVs, and uses a number of case studies to demonstrate some of the options available to local road managers when considering HPFV road access.

1 The term HPFV may also mean other (non-PBS) high-productivity restricted-access vehicles, such as B-doubles, which sometimes require access to local roads that are not presently approved for their use. This report focuses on local road access for PBS-approved combinations, which is the foremost challenge for HPFV access on local roads at the time of writing.

2. Status of Municipal PBS Networks

2.1 National overview

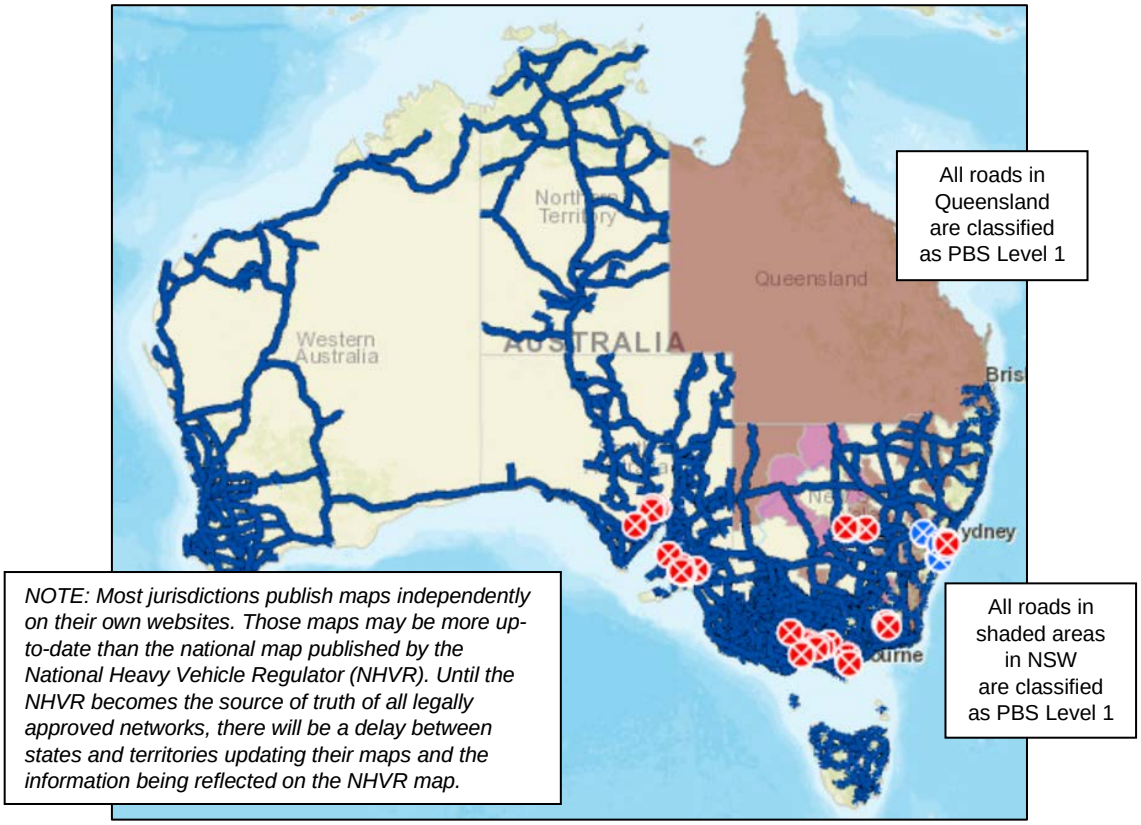
The PBS Scheme was approved by Australian transport ministers in October 2007. The associated road network classification and mapping, which is essential to the operation of the Scheme, has progressed slowly in the years since. There is evidence of great disparity across jurisdictions that can only be attributed to factors other than the suitability of the roads for classification.

The policy position approved by Australian transport ministers in October 2007 (National Transport Commission, 2007) was that PBS Level 1 road access means General Access for vehicles and combinations with an overall length up to 20 metres, subject to the following note:

> *General Access is subject to a 50 tonne[2] gross mass limit, posted local restrictions and restrictions or limitations specified by the jurisdiction.*

It was also agreed by ministers that PBS Levels 2A, 3A and 4A were to be based on existing road networks for 26-metre B-doubles, 36.5-metre road trains and 53.5-metre road trains, respectively. For various reasons most road managers, state and local, have gone on to conduct their network classification and mapping in a manner inconsistent with the agreed national position, with roads being individually assessed. Figure 2.1 shows a high-level view of the current Australian PBS Level 1 road network, which is the network most relevant to local road access.

Figure 2.1: Published PBS Level 1 network in Australia (includes both state and local roads)



Source: National Heavy Vehicle Regulator – Journey Planner, http://gis.nhvr.gov.au/journeyplanner/ (accessed 27 August 2017)

2 In practice the limit is 50.5 tonnes if the motor vehicle has a complying 6.5-tonne steer axle.

At a meeting of the Transport and Infrastructure Council on 19 May 2017, the following was agreed in relation to heavy vehicle productivity. Note in particular the comments relating to General Access for PBS Level 1 vehicles (Transport and Infrastructure Council, 2017a):

> *A range of heavy vehicle policy initiatives designed to boost Australia's heavy vehicle fleet productivity through increases in allowable volumetric load capacity without increasing mass limits were also agreed. These initiatives include greater as-of-right, general access for Performance Based Standard Level 1 heavy vehicles where the infrastructure allows it, greater accountability by road managers to the NHVR for road access requests, and increased access for heavy vehicles 4.6 m in height that meet prescribed conditions. Modelling undertaken under the auspices of the National Transport Commission suggests up to $1 billion per year in realizable benefits can be achieved by industry from these measures.*

At a meeting of the Transport and Infrastructure Council on 10 November 2017, transport ministers approved a change to the Heavy Vehicle National Law to allow general access for PBS Level 1 vehicles up to 42.5 tonnes. It is expected that the corresponding provisions will soon be passed by the Queensland Parliament.

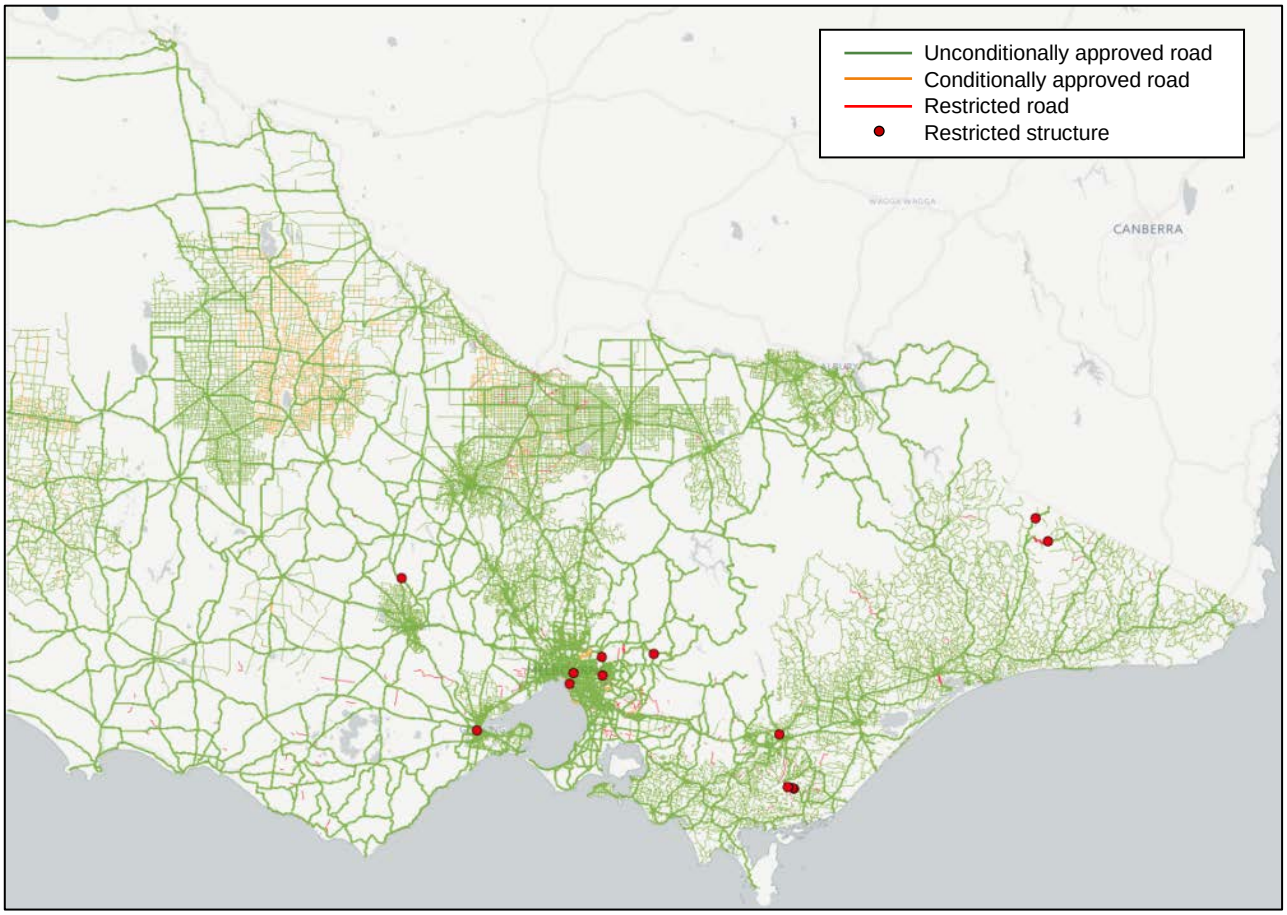
2.1.1 Queensland

Queensland's state and local road managers agreed to adopt the national policy position that all roads would be approved as PBS Level 1, and that all existing restricted access networks for 26-metre B-doubles, 36.5-metre road trains and 53.5-metre road trains would be approved as the corresponding PBS Level 2A, 3A and 4A networks, respectively. The agreed road classifications were formally implemented by the state road authority on behalf of municipalities early in the life of the PBS Scheme, and they continue to have effect under the Heavy Vehicle National Law. Queensland has also developed significant PBS Level 2B links on state roads between the 36.5-metre road train network, the Port of Brisbane, the New South Wales border at Tweed Heads and other strategic locations.

2.1.2 Victoria

Victorian municipalities have spent several years working collaboratively with VicRoads to incrementally add roads to the PBS Level 1 and PBS Level 2A networks. This has involved face-to-face consultation with municipalities by a full-time VicRoads officer and an electronic mapping interface on the VicRoads website that is updated weekly. The whole of Victoria is shown in Figure 2.2, where it can be seen that many municipalities have classified their entire networks as PBS Level 1. Some rural municipalities have gone one step further and classified their entire networks as PBS Level 2A.

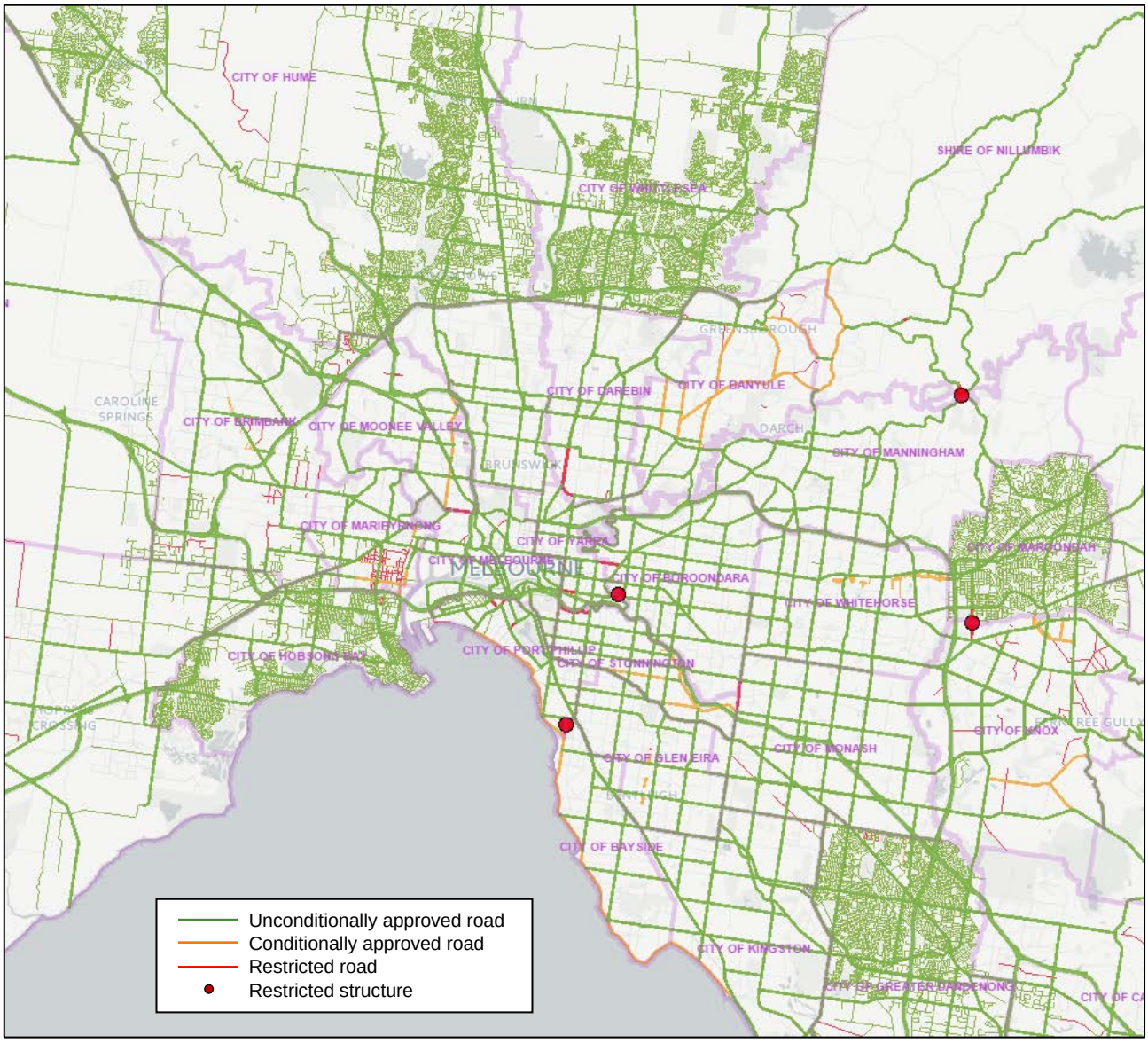
Figure 2.2: Published PBS Level 1 network in Victoria



Source: VicRoads – Heavy vehicle network maps in Victoria, https://www.vicroads.vic.gov.au/business-and-industry/heavy-vehicle-industry/heavy-vehicle-map-networks-in-victoria/ (accessed 2 May 2017)

The Melbourne metropolitan area is shown in Figure 2.3, where it can be seen that significant progress has been made on the PBS Level 1 network in the Cities of Hobsons Bay, Hume, Whittlesea, Maroondah and Greater Dandenong. Some industrial streets in several municipalities have been classified as PBS Level 2A (not shown).

Figure 2.3: Published PBS Level 1 network in metropolitan Melbourne

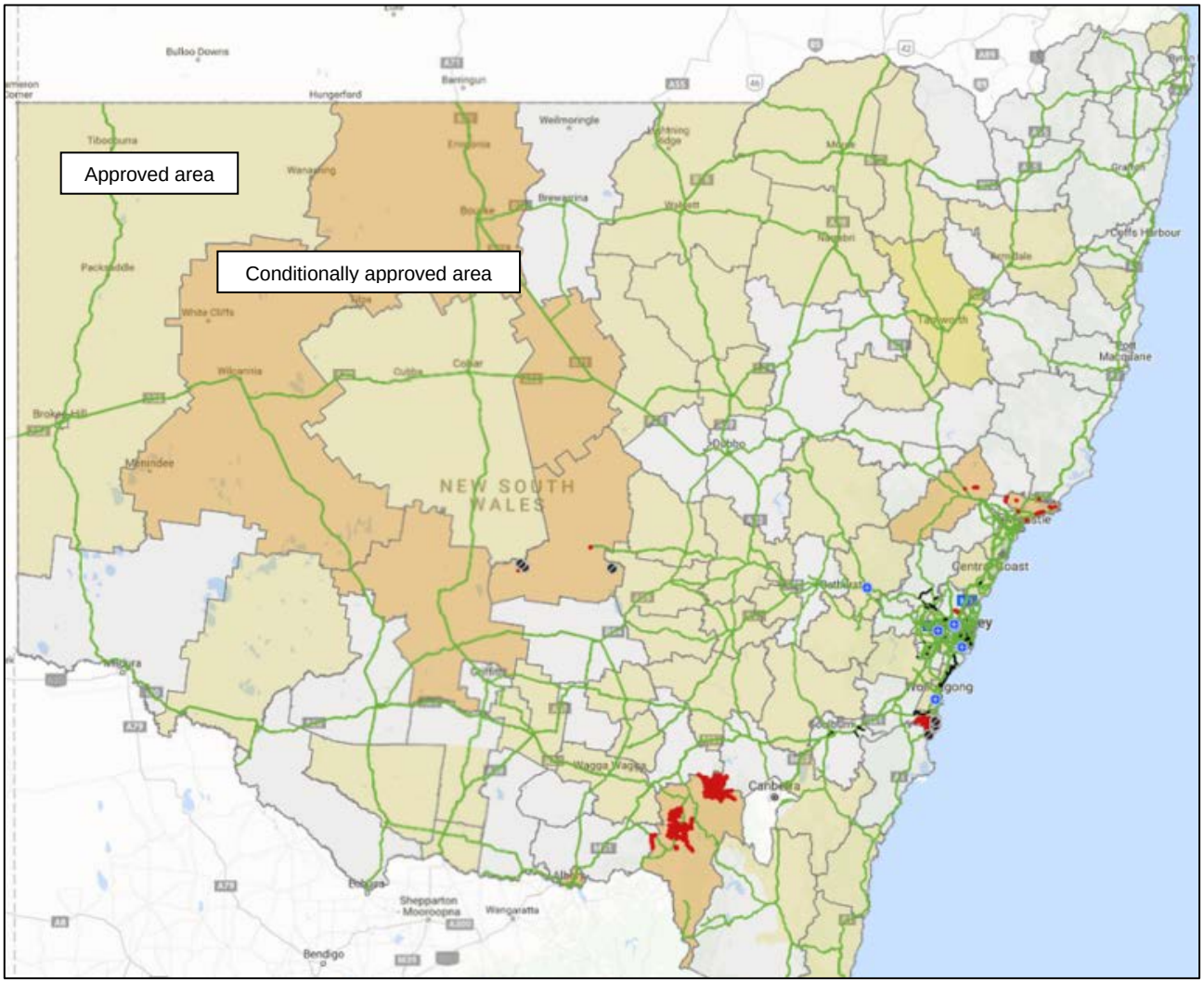


Source: VicRoads – Heavy vehicle network maps in Victoria, https://www.vicroads.vic.gov.au/business-and-industry/heavy-vehicle-industry/heavy-vehicle-map-networks-in-victoria/ (accessed 2 May 2017)

2.1.3 New South Wales

The PBS Level 1 network in New South Wales is quite well advanced in remote areas, with many rural municipalities giving blanket approval for PBS Level 1 (some with conditions) as indicated in Figure 2.4. Where approval is conditional, in most cases the conditions relate only to unsealed roads (dust and wet weather). The PBS Level 2A network has similar coverage in remote municipalities.

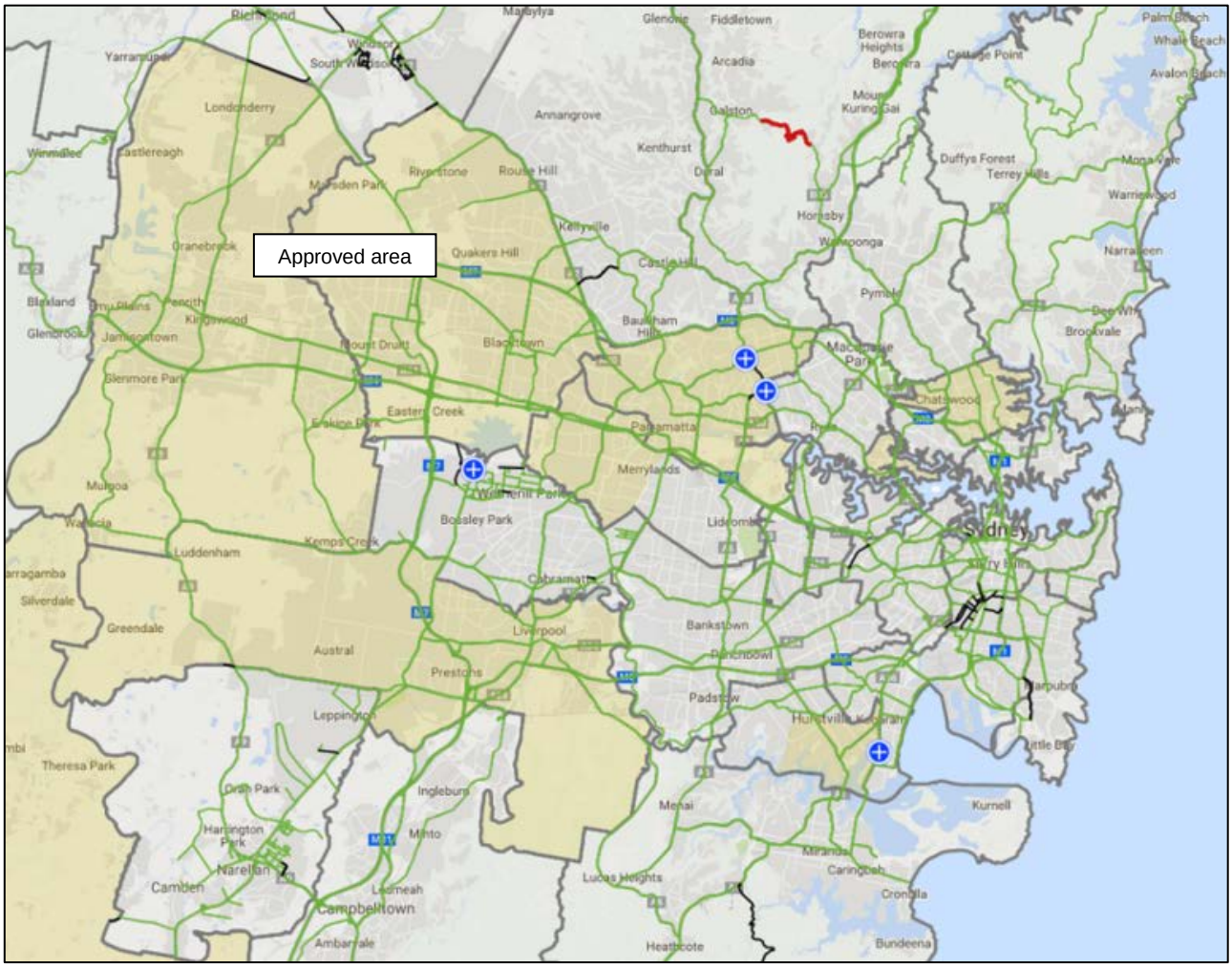
Figure 2.4: Published PBS Level 1 network in New South Wales



Source: Roads and Maritime Services New South Wales – Performance Based Standards Map, http://www.rms.nsw.gov.au/business-industry/heavy-vehicles/maps/performance-based-standards/map/ (accessed 6 October 2017)

Figure 2.5 shows that the PBS Level 1 network in metropolitan Sydney is comprised mostly of state-managed arterial roads, with the exception of several outer municipalities where unconditional blanket approval has been granted. The PBS Level 2A network in metropolitan Sydney incorporates very few local roads at this time.

Figure 2.5: Published PBS Level 1 network in metropolitan Sydney



Source: Roads and Maritime Services New South Wales – Performance Based Standards Map, http://www.rms.nsw.gov.au/business-industry/heavy-vehicles/maps/performance-based-standards/map/ (accessed 6 October 2017)

2.1.4 Tasmania

All State roads in Tasmania are classified as PBS Level 1. No municipal roads have a PBS classification.

The Department of State Growth recently consulted with all Tasmanian municipal road managers with respect to having all municipal roads added to the PBS Level 1 network. This was reportedly the first time that local governments in Tasmania had been formally requested to do so by any government entity. Nevertheless, there were no major concerns and it appears likely that local governments will be supportive of a request, soon to be issued by the Department, that each municipality provides formal consent to add all municipal roads to the PBS Level 1 network.

2.1.5 Northern Territory

As PBS is not specifically recognised under Northern Territory law, the Northern Territory does not maintain a mapped PBS network. The Northern Territory does however recognise PBS approvals and where required will issue three-year permits of exemption to PBS-approved vehicles. Levels of access are considered case-by-case upon application for the permit. Vehicles are for the most part granted General Access, however larger combinations such as road trains may be restricted to major arterials and industrial areas.

It should be noted that some PBS vehicles, and vehicles with comparable or greater productivity, do not require special consent or approvals and have as-of-right General Access, or are captured under alternative schemes in the Northern Territory. As such, applications to recognise PBS approvals are rare.

The Department of Infrastructure, Planning and Logistics generally makes access decisions for PBS-approved vehicles, however will consult with local governments if the proposed vehicle may present any unusual hazards or specific infrastructure concerns.

2.1.6 Western Australia and South Australia

In Western Australia and South Australia, major arterial roads are classified as PBS Level 1. South Australia also has some municipal roads classified as PBS Level 1; these are in the south-east part of the state, on the Eyre Peninsula and within industrial areas around Adelaide. South Australia also has networks for PBS Level 2A, 2B, 3A, 3B and 4A.

2.1.7 Australian Capital Territory

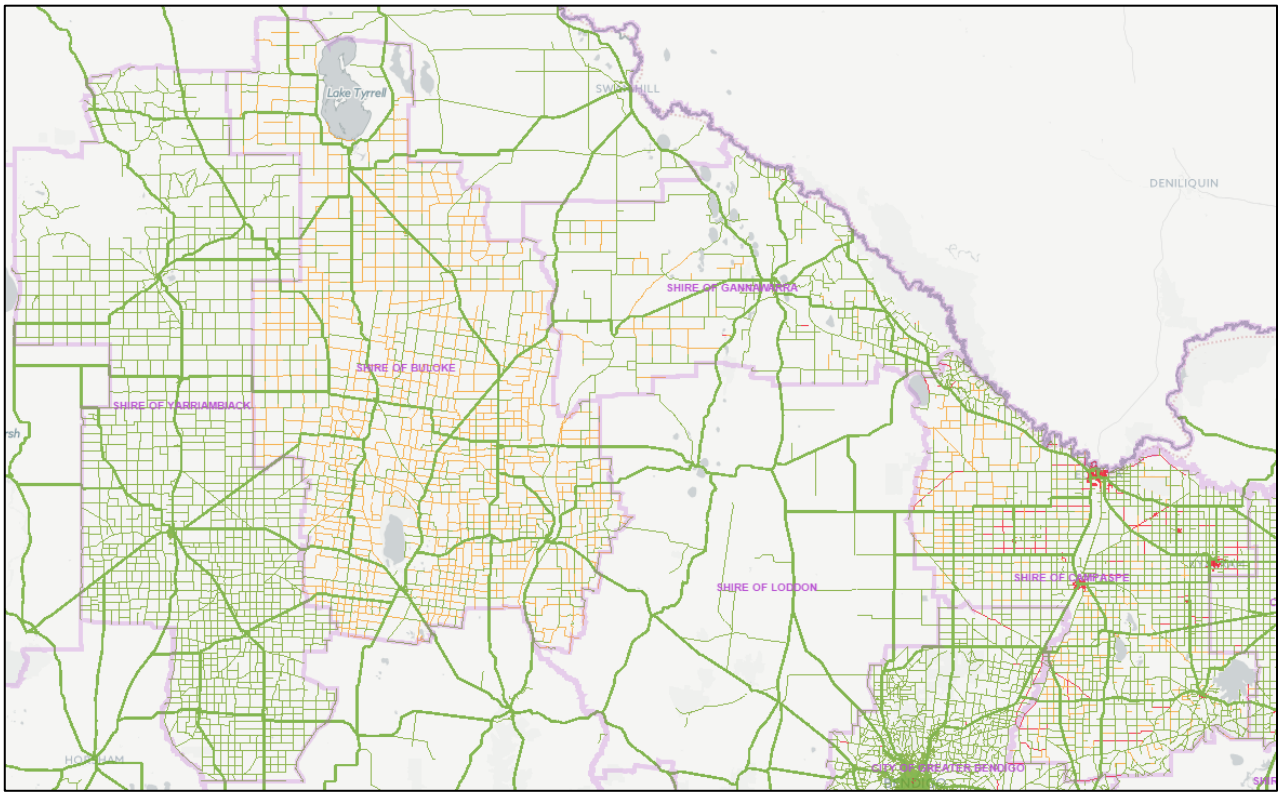
The Australian Capital Territory has a network of major arterial roads classified as PBS Level 1. No other roads in that jurisdiction are PBS-classified.

2.2 Demonstration of how positions can differ between road managers

One can locate many examples of road manager boundaries highlighting different positions on road network classification. Commencing at the state/territory level, with reference to Figure 2.1 (page 2), the termination of numerous PBS-classified Northern Territory roads at the borders of Western Australia and Queensland, and of numerous PBS-classified South Australian roads at the borders of the Northern Territory and Queensland, demonstrates that the same road can be treated differently by different road managers. Similar examples can be found at the municipal level.

Figure 2.6 shows the published PBS Level 1 network across several contiguous municipalities in rural north-western Victoria. The disparate approaches to PBS Level 1 network mapping in the Shires of Yarriambiack, Buloke, Gannawarra, Loddon and Campaspe are contrasted in the following sections. Another contiguous municipality to the north of these, the Rural City of Mildura, is discussed separately.

Figure 2.6: Published PBS Level 1 network in rural north-western Victoria



Source: VicRoads – Heavy vehicle network maps in Victoria, https://www.vicroads.vic.gov.au/business-and-industry/heavy-vehicle-industry/heavy-vehicle-map-networks-in-victoria/ (accessed 27 April 2017)

2.2.1 Shire of Yarriambiack

All roads in the Shire of Yarriambiack are unconditionally classified as PBS Level 2A (which incorporates PBS Level 1). Most of the municipal roads outside of the townships are unsealed. Figure 2.7(L) is typical of a remote, unsealed municipal road, while Figure 2.7(R) is typical of a sealed municipal road in a township.

Figure 2.7: (L) Hopevale Rd, Beulah, (R) Intersection of Murdoch St and Yarrack Ln, Hopetoun

Source: Google Maps, https://www.google.com.au/maps/ (accessed 27 April 2017)

2.2.2 Shire of Buloke

Immediately to the east of the Shire of Yarriambiack is the Shire of Buloke, which has a similar landscape and road network. The Shire of Buloke differs from the Shire of Yarriambiack in terms of its PBS network because, although all of its roads are classified as PBS Level 2A (incorporating PBS Level 1), most of its municipal roads are conditionally classified. The condition placed on these unsealed municipal roads is:

> *Council road accessible in dry weather only and to be used for pick up and delivery, NOT as a through road.*

2.2.3 Shire of Gannawarra

The Shire of Gannawarra has no municipal roads classified as PBS Level 2A, but a significant number are classified as PBS Level 1. Many of those roads are conditionally approved, with the following condition:

> *Council road accessible in dry weather only*

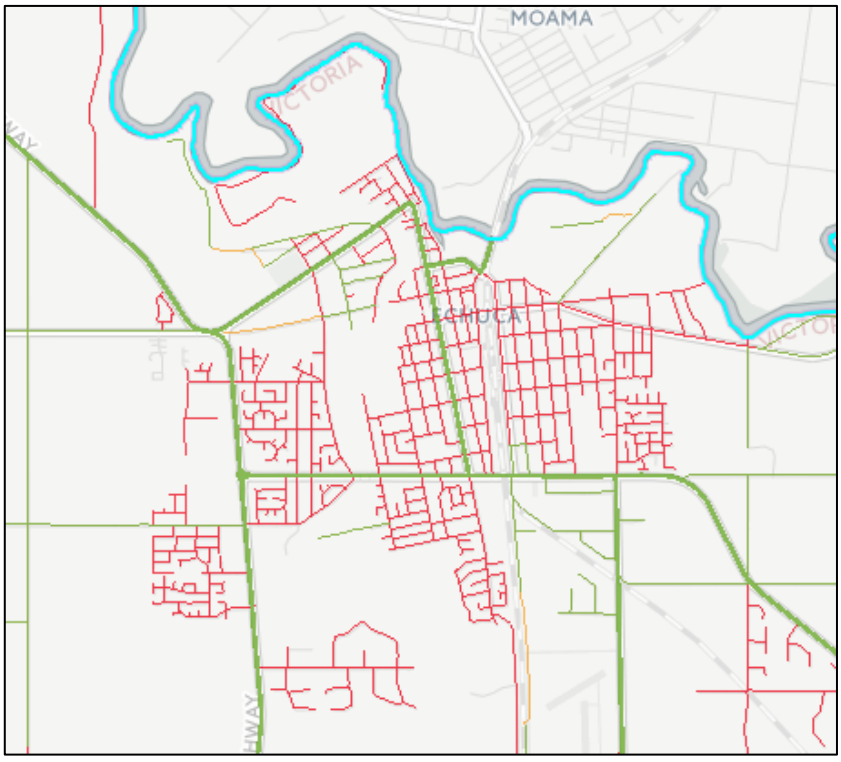
2.2.4 Shire of Loddon

The Shire of Loddon has a comparatively small portion of its roads classified as PBS Level 1, but those that are classified are classified unconditionally. There are no municipal roads classified as PBS Level 2A.

2.2.5 Shire of Campaspe

All roads in the Shire of Campaspe are either classified as PBS Level 1 (conditionally or unconditionally) or explicitly restricted. All of the town centres in this municipality (Echuca, Tongala, Kyabram, Rochester and Rushworth) restrict PBS vehicle access on practically all municipal roads, as shown by example in Echuca in Figure 2.8. The few roads that are not restricted are industrial or sparsely populated.

Figure 2.8: Published PBS Level 1 network in Echuca

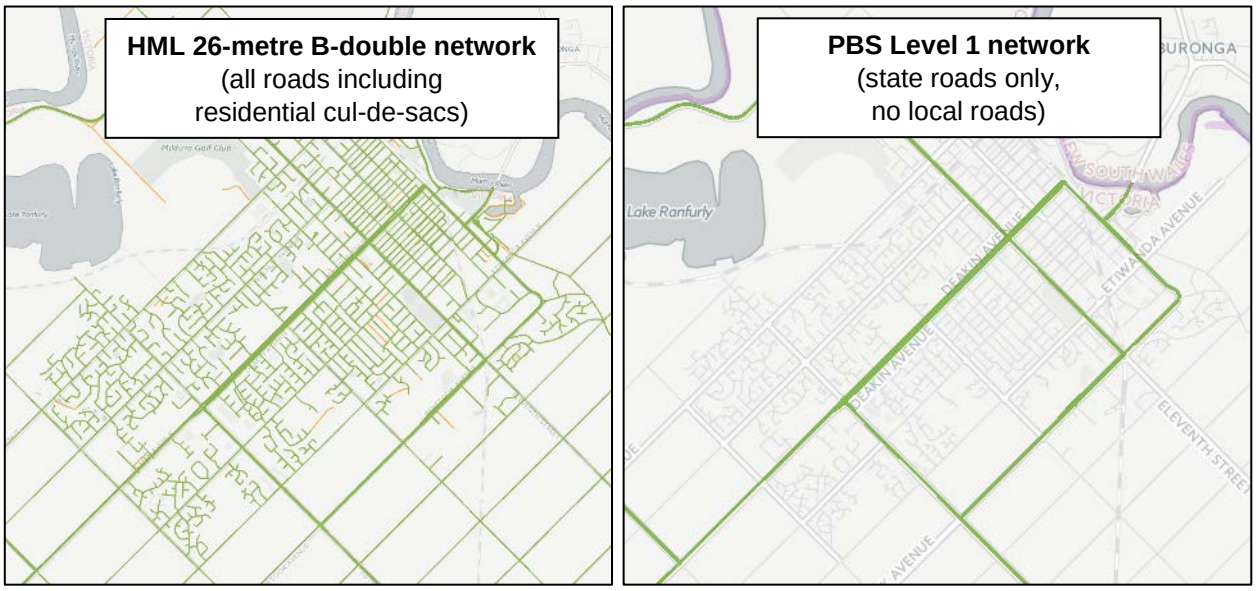


Source: VicRoads – Heavy vehicle network maps in Victoria, https://www.vicroads.vic.gov.au/business-and-industry/heavy-vehicle-industry/heavy-vehicle-map-networks-in-victoria/ (accessed 2 May 2017)

2.2.6 Rural City of Mildura

The Rural City of Mildura, which is contiguous with the Shires previously discussed, has a distinctly different approach to HML 26-metre B-doubles and PBS Level 1 combinations. Figure 2.9 shows the remarkable HML 26-metre B-double network on the left, which features all roads including residential cul-de-sacs, compared with the PBS Level 1 network on the right, which features only state-managed roads. The PBS Level 1 network is intended for vehicle configurations of only 20 metres overall length and 50.5 tonnes gross combination mass, versus 26 metres and 68.5 tonnes for HML B-doubles.

Figure 2.9: Published HML 26-metre B-double and PBS Level 1 networks in Mildura



Source: VicRoads – Heavy vehicle network maps in Victoria, https://www.vicroads.vic.gov.au/business-and-industry/heavy-vehicle-industry/heavy-vehicle-map-networks-in-victoria/ (accessed 27 April 2017)

3. Stakeholder Consultation

The stakeholder groups most relevant to this research are:

- Municipal officers who have a role in heavy vehicle road access decision-making in their municipality
- Representatives of transport companies who have applied for local road access for a PBS vehicle
- Peak bodies who collate and communicate the views of the above stakeholders
- Public sector organisations that have a national role in PBS road access.

In addition to teleconferences with the Project Reference Group (Table 3.1), this research is based on the following consultation methods with other stakeholders (Table 3.2):

- Small-group face-to-face meetings of around two hours with representatives of the one organisation
- One-on-one telephone interviews with targeted individuals who were unable to be consulted personally
- An online survey broadcast to grass roots stakeholders via local government and transport industry associations.

Each consultation method had its benefits:

- Small-group face-to-face meetings with representatives of the one organisation enabled a more personal connection between the researcher and the stakeholders, eliciting deep personal views that might otherwise have been contained in a mixed large-group workshop style of consultation
- Small-group face-to-face meetings allowed each stakeholder to have their say and ensured that the important issues were fully explored
- One-on-one telephone interviews allowed specifically desirable stakeholders to be targeted more easily
- An online survey allowed grass roots stakeholders to have a say.

Table 3.1: Project Reference Group

Organisation	Representative
Roads and Maritime Services New South Wales	Brett Graham
Roads Corporation Victoria (VicRoads)	Peter Michell
Department of Economic Development, Jobs, Transport and Resources Victoria	Peter Frauenfelder*
Queensland Department of Transport and Main Roads	Mark Blanchard
Main Roads Western Australia	Rich Bain
Department of Planning, Transport and Infrastructure South Australia	Lillia Rozaklis
Department of State Growth Tasmania	Andrew Poole
Department of Infrastructure, Planning and Logistics Northern Territory	Jed Graetz
Transport Canberra and City Services Directorate, Australian Capital Territory	Tim Wyatt
Australian Local Government Association	Kym Foster
New Zealand Transport Agency	Marinus La Rooij

** Austroads Project Manager*

Table 3.2: Targeted stakeholders

Organisation	Representatives
Australian Local Government Association*	Kym Foster, John Pritchard
Australian Trucking Association*	Chris Loose, Bill McKinley
Brimbank City Council*	Claude Manno
Cardinia Shire Council*	Nicholas Charrett
City of Whitehorse*	Mirjam Fabijanic
Patersons Transport	Craig Day
Department of Economic Development, Jobs, Transport and Resources (Victoria)*	Peter Frauenfelder
Department of Planning, Transport and Infrastructure (South Australia)*	Carlo Anzellotti, Mark Crossling, Tony Dawkins, Stratton Killis, Stephen Pascale, Lillia Rozaklis, Carmelo Rositano, Angela Slagter
Department of Transport and Main Roads (Queensland)*	Larry Griffiths, Russell Hoelzl, Paul Langton, Chris Lunson, Geoff McMillan, David Wilson
Local Government Association of Queensland*	Scott Britton, Robert Chow
Local Government Association of South Australia*	Lea Bacon, Neville Hyatt
Local Government New South Wales*	Richard Connors
Municipal Association of Victoria*	John Hennessy, Ian Mann (consultant)
National Heavy Vehicle Regulator*	Jose Arredondo, Roger Garcia, Nick Gralton, Kerry Plater
National Transport Commission*	Julian Del Beato, Sri Kannan
Pickering Transport Group	Bernie Belacic
Roads and Maritime Services New South Wales*	Brett Graham, Reuben John
Transport Certification Australia*	Chris Koniditsiotis
VicRoads*	Peter Michell, David Moore, Sam Palermo, Victor Trumper

** Consulted via a face-to-face meeting*

4. Online Survey

An online survey was conducted early in the project to allow grass-roots input into the process of identifying barriers to local road access and case studies of access decisions where such barriers were overcome. There was a low response rate and many responses were incomplete. Consequently, the survey findings do not represent the views of a significant number of municipalities.

4.1 Design

The 7-page survey targeted two distinct stakeholder sub-groups—local road managers, and transport companies seeking local road access—so respondents were only served specific pages of the survey that were relevant to their previous responses.

The survey is reproduced in full in Appendix A. Headings indicate which respondents were served each page.

4.2 Data collection

The primary means of disseminating the survey to the two stakeholder sub-groups were:

- The Australian Local Government Association (ALGA) distributed the survey to all of the state/territory Local Government Associations, who were asked to distribute the survey to local councils.
- The Australian Trucking Association (ATA) and Heavy Vehicle Industry Australia (HVIA) distributed the survey to their member organisations, which include state-based and industry-specific transport associations, major transport companies and major industry suppliers. Member associations were asked to distribute the survey to their own members.

4.3 Analysis

The survey attracted 31 responses, of which 11 were valid.

Two of the 11 valid responses provided contact details only. One of those was from a Local Government Association and one was from a trailer component supplier.

Of the remaining nine valid responses, three were from local councils, two were from Local Government Associations and four were from transport companies.

4.3.1 Local government respondents

The three local councils who took part in the survey were not the same as those who took part in face-to-face consultation. None of the local councils had previously contributed to any road access decisions for PBS vehicles. One of the Local Government Association respondents reported contributing to two road access decisions for PBS vehicles, of which one was successful. This respondent provided the following statement describing how the successful access decision had faced a barrier that was ultimately overcome:

> *Lack of factual information. Overcome through providing sound advice on which a good decision could be made.*

The most valuable part of the local government responses was the ranking of their concerns about various potential barriers to access. Respondents were asked to give a ranking of high, medium or low to describe the level of concern they had for 11 different issues that could potentially be a barrier to local road access.

Table 4.1 lists the 11 concerns and the rankings given by the respondents who answered this question.

Table 4.1: Level of concern about various potential barriers

Potential barrier		Likelihood that the potential barrier would cause concern for the respondent L = low, M = medium, H = high (by respondent)				
		1	2	3	4	5
1	Understanding of the vehicle configuration	M	H	M	M	M
2	Concerns about road safety	M	M	H	H	H
3	Access to evaluation tools and guidelines	M	H	H	M	M
4	Information about infrastructure capacity (geometric, structural)	M	H	H	H	M
5	Geometric capacity to handle longer combinations	M	M	H	H	H
6	Bridge structural capacity to handle heavier combinations	M	M	H	H	H
7	Effect on infrastructure maintenance intervals and life cycle costs	M	L	H	M	H
8	Resources to conduct evaluations	M	H	H	H	H
9	Amenity considerations	M	L	M	L	M
10	Concern about setting a precedent and 'opening the floodgates'	M	M	M	M	H
11	Compliance with conditions such as speed, mass, time-of-day and approved routes	M	L	M	H	H

In the absence of any clear trends in the responses, the subtle take-home messages are:

- Potential barrier 8 (resources to conduct evaluations) was of the greatest concern, receiving four high rankings and one medium ranking.
- Potential barrier 9 (amenity considerations) was of the least concern, receiving two low rankings and three medium rankings.
- Potential barriers 7 and 11 received a mixture of low, medium and high rankings. All other potential barriers received only medium and high rankings.
- Respondent 2, who stood out for giving three low rankings, is from a remote area in the Northern Territory.

4.3.2 Transport industry respondents

The issues raised by the four transport industry respondents were:

- One respondent complained that he was unable to operate at Higher Mass Limits over a state-managed bridge in New South Wales unless he enrolled in the Intelligent Access Program and fitted onboard electronic scales to his PBS combination. As this is consistent with the long-held position of Roads and Maritime Services New South Wales, it was not considered further in this research.

- One respondent advised that he was able to secure access for a 30-metre combination on some local roads subject to swept path assessments for some turns. He argued that the combination satisfied Level 2 standards and therefore should not be subject to swept path assessment. This issue is discussed in Sections 5.2.3 and 6.2.
- Two respondents complained about the revocation of PBS road classifications in New South Wales for truck and dog combinations. This issue is discussed in Section 5.5.6.

5. Barriers to Local Road Access

Stakeholder consultation revealed that the barriers to local road access for high-productivity freight vehicles are more likely to be perceived than actual, and that education about the PBS Scheme may assist in addressing perceived barriers to access.

The degree of resistance to access varies considerably with the degree of compatibility between the proposed vehicle and the road on which it seeks access. Consider the following scenarios:

- A PBS vehicle of a particular level (e.g. Level 2A) seeks access to a road with the corresponding design standard (e.g. classified as Level 2A or better, or yet to be PBS-classified but already gazetted for B-double access)[3]
- A PBS vehicle of a particular level (e.g. Level 2A) seeks access to a road with a lower design standard (e.g. classified as Level 1, or yet to be PBS-classified and not already gazetted for B-double access).

In the first scenario, where the vehicle and road geometric standards are supposed to be matched, barriers to access are less likely to be technical. Where a technical barrier does exist in this scenario, it is more likely to be about bridge capacity than about geometric fit.

In the second scenario, where the vehicle and road geometric standards are not matched, barriers to access are more likely to be technical, and may include amenity in addition to bridge capacity and geometric fit.

The following sections discuss the many barriers to high-productivity freight vehicle access that were either raised or inferred during stakeholder consultation.

5.1 Misunderstanding the finite freight task

The amount of road freight transported in Australia is independent of the types of heavy vehicles used. Take a commercial, agricultural or industrial precinct in any Australian city or local government area; the farms, factories, warehouses, processing plants, retail outlets and other freight-generating businesses that operate in that precinct have a certain amount of business that requires a certain amount of freight to be moved; that amount of freight is driven by the size of the economy and the success of the businesses, not simply by the ability to fit more freight on each heavy vehicle. It follows that using heavy vehicles with a greater freight capacity, whether that be greater mass, greater volume or both, will not result in more freight being transported, but rather will result in a reduction in the number of heavy vehicle movements required to service the given freight task over a given period of time.

In the consultations it emerged that recognition of this basic principle is limited. In one case, a local road manager had to be counselled on the fact that heavy vehicles transporting product from a factory with 20 per cent more payload capacity per vehicle would not result in the factory automatically generating 20 per cent more product; rather, the same amount of freight would be transported with fewer trips. Larger vehicles do not directly cause more freight to be generated.

3 Let us set aside, for the time being, that parts of the gazetted B-double network do not meet the design standard recommended for B-doubles. This subject is discussed in Section 5.4.1.

Consider another example in the dairy industry. Dairy cows produce milk every day; the amount of milk produced each day varies with the seasons, but on any given day of the year it is more or less governed by nature. If a certain number of cows on a certain number of farms produce a certain amount of milk each day, and a certain number of heavy vehicles make a certain number of trips each day to collect that milk and transport it to a processing plant, then using larger, heavier vehicles with a greater capacity per vehicle will mean fewer vehicle-kilometres to transport that fixed amount of milk. The dairies will not produce more milk unless their production capacity is increased. The number of heavy vehicle movements will diminish for a given production capacity.

What is not always clear to the local road manager is that a more productive vehicle is likely to replace a less productive vehicle, and the number of vehicle movements, if not the number of vehicles altogether, is likely to be lower across the transport task when higher-productivity vehicles are employed.

5.2 Misunderstanding the PBS Scheme

The PBS Scheme was for many years considered to be an arcane system for niche road transport operations. When take-up started to boom over the past five years, some municipalities invested heavily in understanding and proactively preparing for the more general take-up of the Scheme. Within a large number of councils there appears to be limited experience with, and understanding of, the PBS Scheme; this has contributed to inefficiencies in the assessment of road access applications. The following sections outline many barriers to road access that are suggestive of a limited understanding of the PBS Scheme by road managers.

5.2.1 Perceived risks to safety, infrastructure or amenity

Stakeholder engagement suggested that there is a perception that PBS vehicles, by definition, bring with them an increased risk to public safety, infrastructure integrity and amenity. Consequently the default position taken in many cases is that this perceived increase in risk must be contained, monitored, compensated for, or avoided altogether. Refusing access to PBS vehicles limits the uptake of newer, safer heavy vehicles and puts upward pressure on the average age of the Australian heavy vehicle fleet. PBS vehicles are proven to be less likely to be involved in a crash (Austroads, 2014). A key finding of Austroads (2014) was that PBS vehicles were responsible for 66 per cent fewer crashes than conventional vehicles per unit of distance travelled. When considering only serious and major crashes, PBS vehicles were responsible for 76 per cent fewer crashes than conventional vehicles per unit of distance travelled.

Elected local councillors acting in the interests of their local community can face challenges when considering road access for larger vehicles, even if their own understanding is sufficient to support access. It can be difficult to communicate the benefits of certain access decisions to the broader community.

Such restrictions on PBS vehicle access are inconsistent with the actual risk faced. Targeted communications with residents regarding the safety and productivity improvements offered by PBS vehicles may assist road managers in more readily approving access for these combinations.

5.2.2 Mistaking PBS vehicles for HML/OSOM vehicles

The Municipal Association of Victoria reported that due to the relative timing of the PBS Scheme and Higher Mass Limits access being rolled-out in Victoria, local road managers who are not well-versed in the PBS Scheme have a tendency to think of applications for PBS vehicle access as being similar to those that they are accustomed to receiving for Higher Mass Limits (HML) and Class 1 Over-Size Over-Mass (OSOM) permits. Those pre-existing application types are the ones that local road managers will have spent the majority of their time on in the years prior to the more general uptake of PBS, and with good reason those are the ones that will have given them cause to give greater consideration to safety, infrastructure and amenity risks.

These distinct silos of heavy vehicle access management, each of which has its own access management issues, tend to be blended into one in the mind of the local road manager, which can have a crippling effect on what should, in many cases, be a relatively uncomplicated road access decision. It is not uncommon for issues totally irrelevant to a PBS road access decision to be the reason why access is not granted.

It was also noted that an increasing number of PBS combinations with tandem axle groups have the same gross combination mass under both CML and HML. Councils sometimes get confused about which mass limit scheme the vehicle is operating under, which can have an impact on access decisions.

5.2.3 Expecting swept path width to be too great

Swept path width is one of the many aspects of heavy vehicle performance that is directly controlled by the PBS safety-related standards to remain within acceptable limits. Nevertheless, swept path width was often brought up in the consultations as both a safety and infrastructure concern. No other aspect of performance was mentioned.

Municipal officers reported a resistance to allowing access for PBS vehicles unless swept path width was checked first, because:

- it was believed that there would be an increased risk of damage to infrastructure such as kerbs and pits near the apexes of left-hand turns
- it was believed that the vehicle may not be able to enter or exit a property without modifications to the gate and the crossover
- it was believed that the vehicle may not be able to turn around within the bounds of a property and exit the property in a forward direction.

Anecdotally, road access decisions that were initially being hindered by concerns about swept path width were ultimately resolved once it was established that the PBS vehicle did in fact have acceptable swept path width. The method of establishment in these situations was typically either a computer-based swept path analysis, a controlled physical demonstration or an explanation of how swept path is controlled in the PBS Scheme . In all of the cases discussed with stakeholders in preparing this report, the longer PBS vehicle was found to have no more swept path width than the vehicles already approved to use the road. For example, where 26-metre B-doubles are already approved, 30-metre A-doubles that meet Level 2 standards do not have greater swept path.

Despite the fact that the PBS standards require vehicles to demonstrate acceptable swept path width in order to access the same roads as equivalent prescriptive vehicles, it is anecdotally common for road managers to either not grant access on the basis of assumed or perceived greater swept path width, or request swept path width to be checked. It appears that a lack of understanding by road managers regarding the comparison between PBS combinations and their prescriptive counterparts impedes road access decision-making.

At times it is necessary to consider access for large vehicles on roads that do not currently accommodate vehicles of that size; for example, when considering access for a PBS Level 2A vehicle on a road that is only classified as PBS Level 1. There are some technical ‘grey areas’ to contend with if swept path performance is being checked for such access decisions. For example, it is legal, by exemption from the relevant road rule, for a vehicle to cross the road centre-line when turning into a property, if it is safe to do so. A road manager however may not feel comfortable allowing access if that manoeuvre is likely to be performed many times per day; one may question whether the intent of the exemption was only to accommodate occasional occurrences. Another example is how much of a margin to allow between the edges of the swept path envelope and any kerbs or seal edges. Normal practice is to allow 0.6 metres but one state road authority advised that it regularly uses less than 0.6 metres to allow access for more desirable PBS vehicles.

5.2.4 Misunderstanding of the relationship between PBS networks and existing networks

The PBS Scheme was built on the concept of matching vehicles and roads. Vehicles and roads are independently assessed using objective measures and given classifications of 1, 2, 3 or 4. A vehicle with a particular classification number is eligible to operate on a road of the same or higher classification number, subject to road manager approval.

It is important to note that the levels into which vehicles are classified were developed based on the performance characteristics of the prescriptive fleets operating at the time of the development of the standards.

The Network Classification Guidelines (National Transport Commission, 2007) describe the four levels of PBS road classification and the corresponding four levels of PBS vehicle classification in terms of their correlation with existing prescriptive vehicle classes, as shown in Table 5.1.

Table 5.1: PBS network descriptions adapted from the Network Classification Guidelines (Table 1)

PBS road classification	PBS vehicle classification	Equivalent prescriptive vehicle configuration
Level 1	Level 1	19-metre prime mover and semi-trailer
Level 2	Level 2	26-metre B-double
Level 3	Level 3	36.5-metre A-double road train (Type I)
Level 4	Level 4	53.5-metre A-triple road train (Type II)

The reason this correlation exists is two-fold:

- The Network Classification Guidelines were based on existing road design guidelines for the listed present vehicle types
- The Standards and Vehicle Assessment Rules (National Transport Commission, 2008) ensure that PBS vehicles and combinations that are assessed and classified into one of the four levels have on-road performance suitable for operation on the corresponding network.

This means:

- a road currently accessible by General Access combinations should be classified as PBS Level 1
- a road currently accessible by 26-metre B-doubles should be classified as PBS Level 2
- a road currently accessible by 36.5-metre A-doubles should be classified as PBS Level 3
- a road currently accessible by 53.5-metre A-triples should be classified as PBS Level 4.

Local road access for PBS combinations does not reflect the correlation between prescriptive combinations and PBS combinations.

5.2.5 Distinguishing the difference between Class A and Class B networks

The Network Classification Guidelines set out two classes of PBS road network—Class A and Class B—as shown in Table 5.2.

Table 5.2: Network access by vehicle length

Vehicle performance level	Network Access by Vehicle Length, L (m)	
	Access Class A	Access Class B
Level 1	L ≤ 20 (General Access*)	
Level 2	L ≤ 26	26 < L ≤ 30
Level 3	L ≤ 36.5	36.5 < L ≤ 42
Level 4	L ≤ 53.5	53.5 < L ≤ 60

** General Access is subject to a 50 tonne[4] gross mass limit, posted local restrictions and restrictions or limitations specified by the jurisdiction*

The reason that a distinction was made between Class A and Class B based on the overall length of the combination was to overcome some of the length-related issues that are important in road classification but are independent of vehicle performance. (These are discussed later in this section.) When road managers were asked to commence classifying roads into the four PBS Levels—knowing that PBS vehicles could be longer than prescriptive vehicles—they asked, '*How long could these PBS vehicles get? We need to know so that we can account for the increased length when checking certain things in our route assessments.'* The policy response was to introduce Class A networks for PBS vehicles that are not longer than existing prescriptive vehicles. That way the entire B-double network, for example, could be migrated to a PBS Level 2A network for PBS vehicles up to 26 metres long. Then the Class B networks were to be based on an increased length, which was to be accounted for in the network classifications. The increased length to assume for each network level was agreed based on the vehicle types that would be likely to seek access to those networks. For example, 30 metres was selected for Level 2B because that was a neat fit for two 40-foot shipping containers or two 20-pallet semi-trailers in either a long B-double or a short A-double configuration.

The Queensland Department of Transport and Main Roads has developed a supplement to the Network Classification Guidelines intended to be used in the task of assessing Class B networks (Department of Transport and Main Roads, 2014). The supplement identifies that the increased length of Class B vehicles will place increased demands on road infrastructure, and it provides recommendations and updated data relating to the following parameters:

- Signal timing, stacking distance and storage lengths at intersections
- Warning times and stacking distances at railway level crossings
- Overtaking provision
- Rest area, de-coupling area and enforcement bay size.

It is important to note that these parameters do not include swept path width or carriageway width requirements. That is because Class B vehicles are subject to the same performance requirements as Class A vehicles in these respects, including those for swept path and straight-line tracking performance. A 30-metre A-double is referred to as a PBS Level 2B combination only because it is longer than 26 metres; in all other respects it has performance suitable for Level 2A access.

Whenever a road manager does not allow a PBS Level 2B vehicle to access a PBS Level 2A road or a gazetted B-double road on the grounds of swept path width or lane width, it may be considered that an incorrect access decision has been made, unless the road is not actually of Level 2A or B-double standard.

4 In practice the limit is 50.5 tonnes if the motor vehicle has a complying 6.5-tonne steer axle.

5.2.6 Axle group loads are the same

The maximum mass permitted to be carried by each axle or axle group of a PBS vehicle is the same as that permitted for the same type of axle or axle group of a prescriptive vehicle. For example, whether a vehicle is PBS or prescriptive, a triaxle group is permitted to carry 20 tonnes (General Mass Limits). The gross combination mass of a PBS combination may however be higher than that of a prescriptive combination if it has more axles. Individual axle or axle group loads can actually be less for a PBS combination because some PBS combinations are limited to lower axle loads for compliance with safety or infrastructure standards. A good example is high-mass combinations operating at 'Tier 1' axle loads, which are reduced axle loads satisfying the bridge formulae. The combination may only be approved at the maximum axle loads on a specific route, and may have Tier 1 axle loads approved for other roads.

If the gross combination mass is higher, this will increase the loading on some types of bridges, typically those with continuous spans or those with long, simply-supported spans. Short-span bridges and culverts will not be affected because they do not need to support all axles of the combination at once. Nevertheless, where bridge loading is increased, a road manager should determine whether that additional loading can be accommodated within the bridge's capacity and not refuse access due to 'increased bridge loading'.

By virtue of the fact that the axle group loads are the same as for prescriptive vehicles, a PBS vehicle cannot cause more damage to a pavement than the equivalent prescriptive vehicle.

5.2.7 Difficulty interpreting a PBS Vehicle Approval

A PBS Vehicle Approval (formerly known as a PBS Final Approval) is a certificate issued by the National Heavy Vehicle Regulator when a PBS Certifier has inspected a proposed PBS combination and established that the combination meets all of the minimum design specifications listed in the corresponding PBS Design Approval. The PBS Vehicle Approval number is required when applying for a permit. In the case of most truck and dog combinations, the PBS Vehicle Approval in combination with the National Truck and Dog Notice takes the place of a permit.

A PBS Vehicle Approval contains such information as:

- mass limits
- operating conditions
- exemptions from Australian Design Rules and National Regulations
- dimensions
- VINs and relevant technical specifications of all vehicle units covered by the approval
- tyres fitted to the vehicle at inspection and those that may replace them in future.

The mass limits section of a PBS Vehicle Approval can be difficult to interpret, particularly where mass limits are dependent on:

- axle spacings
- the classification of the road or network on which the vehicle is operating at any point in time, in which case the same vehicle might have different mass limits on different roads
- the type of bridge assessment conducted, in which case 'Tier 1' mass limits, based on bridge formula calculations, are allowed network-wide while 'Tier 2/3' mass limits, based on more complex assessments, are allowed only on approved parts of the network, and often only on specific routes.

A local road manager may be considering a permit application that has a page of tables setting out the applicable axle group and gross combination mass limits. Some combinations have one set of Tier 1 mass limits for Level 1 roads, one set of Tier 1 mass limits for Level 2 roads, and a set of Tier 2/3 mass limits for specific roads approved by the road manager. All of these limits may have a degree of variability depending on the specific dimensions of the combination, which may vary between different vehicle units listed on the PBS Vehicle Approval.

It has been suggested that this section of the PBS Vehicle Approval should be clarified, and that the degree of complexity that can be incorporated into a single approval should be limited.

Not only is this a barrier to local road access approval, but it makes roadside enforcement difficult. If a PBS Vehicle Approval cannot be understood by the roadside enforcement officer, it is more likely that non-compliant operation will fail to be identified. Stakeholders advised of a tendency for roadside enforcement officers to give vehicle operators the benefit of the doubt if a PBS Vehicle Approval is too complex.

Notwithstanding all of the above discussion, in many cases the fine details of a Vehicle Approval should not matter all that much. For example, many 7-axle PBS truck and dog combinations are subject to the sorts of complexities described in this section, but all of them lie within the same overall bounds of 20 metres overall length and 57.5 tonnes gross combination mass. Road manager approval may be considered on the principle of accepting a vehicle that falls within the envelope, which would relieve some of the complexity in access assessment.

5.2.8 Lack of support from the National Heavy Vehicle Regulator (NHVR)

Local council stakeholders expressed a united view that support from the National Heavy Vehicle Regulator (NHVR) was insufficient. Many of those stakeholders referred to previous indications by the NHVR that tools would be created and made available to local councils to assist in dealing with PBS road access. Examples included a ready reckoner to which road managers could refer to assist with PBS road access decisions, and a set of standard operating conditions to be applied in various circumstances. It is understood that while these items have yet to be made available.

One Local Government Association made the comment that the NHVR has produced no plan or roadmap for the direction and future of PBS, which is making it difficult for them to communicate and unite their members in action towards better PBS road access.

5.2.9 Staff changes and loss of corporate knowledge

Regardless of how much is done to improve the education level of municipal road managers in relation to PBS, staff turnover is a universal problem. Understanding PBS is an ongoing journey for an individual which can take years to achieve, so changes in staffing results in serious corporate knowledge loss. At times a municipality may have a key staff member on leave and a backup person needs to take over. That person is not as well-versed as the usual respresentative, either through lack of training and experience or lack of continuity in the role, and will typically struggle with certain road access decisions.

5.3 Fear of unintended consequences or of personal liability

5.3.1 Opening the floodgates

Road managers often complain of a fear of ‘opening the floodgates’ when considering more expansive access for high-productivity freight vehicles. This kind of aversion to progressive access decision-making is unduly restricting access in certain scenarios.

Consider the following three hypothetical scenarios:

- **Scenario A:** A local road manager who is considering access for a PBS vehicle on a road that *already allows* a corresponding prescriptive heavy vehicle fears that granting access may attract many more such applications for access to that road.
- **Scenario B:** A local road manager who is considering access for a PBS vehicle on a road that *does not already allow* a corresponding prescriptive heavy vehicle fears that granting access may attract many more such applications for access to that road.
- **Scenario C:** A local road manager who is considering access for a PBS vehicle *on a particular road* in their municipality fears that granting access may attract applications for access *to other roads* in their municipality.

In the consultations this topic was typically first discussed with Scenario A in mind. The benefits of PBS vehicles—particularly in terms of fewer heavy vehicle movements without exceeding the capability of the road—were mutually accepted, and it was soon acknowledged that a fear of Scenario A is unfounded. If anything, a local road manager should be encouraging the type of access described in Scenario A, because of the benefits it brings to all parties concerned.

Discussions then moved onto Scenario B, where local road managers explained that they might be willing to allow access for a longer and heavier vehicle under permit, for example for a B-double combination making one delivery per week to a factory on a non-gazetted road, because the benefits of that access would outweigh the impost. Many more such vehicles, however, could not be permitted to use the same road using that logic. If, for example, all of the factories on that road decided to start receiving goods by B-double, the road might have to accommodate many movements per day and could become unsafe. Of course, the road manager is not required to consider these potential future access requests, and should consider each present case on its merits, but it is natural for a road manager to think of the future implications of any present access decision.

Finally, Scenario C brought up a kind of fear that is almost impossible to protect against: the fear of the unknown. If local businesses became aware of improved access being granted in one part of the municipality, they might be prompted to seek similar access approval in other parts of the municipality. The local road manager might expect applications to start coming in for just about any road in the municipality, without knowing in advance which roads they might be, what type of vehicle might be involved, and whether or not access will be possible in every case. This is the worst kind of fear, as it can prevent a road manager from making any decisions at all.

5.3.2 Increased responsibility on local road managers

Prior to the Heavy Vehicle National Law (HVNL) a state road authority had the power to grant heavy vehicle access to any road, including local roads, without a legal obligation to seek approval from local road managers. Under the HVNL, each road manager is solely responsible for consenting to heavy vehicle access to the roads it manages.[5,6]

This places a new responsibility on the local road manager—one for which they may be ill-equipped to handle—and it can have an almost paralysing effect. Should there be any serious adverse consequences resulting from a poor access decision, such as an avoidable fatality or catastrophic failure of a large structure, the municipal officer responsible for the decision could be held personally liable.

5 In New South Wales prior to the HVNL a Ministerial Delegation allowed Roads and Maritime Services to grant access to certain PBS vehicle configurations only.

6 Despite there being no legal obligation to do so, when VicRoads rolled out its B-double and Higher Mass Limits networks, a condition of access was that operators were required to seek local road manager endorsement for access to local roads on the network. Compliance with this condition was below expectations, which saw local road managers receive an artificially low number of access requests pre-HVNL and a step increase in requests upon HVNL implementation.

From discussions with Queensland stakeholders in particular (Section 5.3.4) and to a lesser extent in other jurisdictions, consideration of personal liability can lead to unduly conservative decisions, such as unnecessary operating conditions, unnecessary and costly engineering assessments, or access refusal altogether. The NHVR is working to clarify the subject of personal liability for municipalities.

5.3.3 Outsourcing engineering assessments

An example of a workaround used by a municipal officer who was unable to make an access decision involving a high-mass combination crossing an ageing bridge was to grant access on the condition that the applicant first engaged a consulting engineer to perform a bridge loading assessment, and accept liability in the event that there was a structural failure. It is unlikely that the applicant would have been successful in completing that task.

Outsourcing engineering assessments can work where a road manager is under-resourced and the consulting engineer has an existing relationship with the road manager and good access to asset data. In general, however, it is understood that consulting engineers may take a more conservative approach than the infrastructure owner, partly because of their less intimate knowledge of the assets but also because of their own fear of liability and rising professional indemnity insurance costs.

5.3.4 Queensland-specific liability issues

In Queensland an engineer must be qualified as a Registered Professional Engineer of Queensland (RPEQ) to provide engineering advice where the parameters for consideration are outside of established boundaries; in other words, wherever engineering judgement is necessary. In the PBS context—for example, where access is sought on a road that has yet to be PBS-classified—engineering judgement may be required when considering access unless the road manager is able to make a decision using the established Network Classification Guidelines (National Transport Commission, 2007).

An RPEQ will make an access decision on a technical basis. The municipality's engineering manager, who is ultimately responsible for the road network in a local government area, can make the final decision after considering the advice of the RPEQ and other factors such as the benefit to the local community and responding to community attitudes to heavy vehicles. In the event that the RPEQ advises against granting access, even if that advice happens to be based on unduly conservative assumptions for the reasons described earlier, it would be a brave engineering manager who grants access against the RPEQ's advice.

Approximately half of all municipalities in Queensland have an RPEQ on staff. The other half may have engineers without an RPEQ qualification who may or may not be aware of the need to engage an RPEQ for certain access decisions.

5.4 Insufficient or unknown infrastructure capacity

Governments—including at the local level through the Australian Local Government Association—are engaged in the Heavy Vehicle Road Reform (HVRR) process endorsed by the Council of Australian Governments (COAG). A key element of the HVRR process is to improve data collection across the road network through the development of asset registers. This process has to-date focused on key freight routes, but it is envisioned that it will include local government roads in the near future. Transport and Infrastructure Council (2017b) contains further details of the HVRR process.

Infrastructure capacity, in terms of both design standard and condition, will be discussed in terms of:

- Road geometry
- Structures (bridges and culverts)
- Pavements.

These aspects of infrastructure design are ostensibly technical and more likely to be insurmountable barriers to road access. They are, however, equally exposed to the potential for poor access decision-making.

In any debate about whether or not the design standard or condition of a particular piece of infrastructure is a barrier to road access, one must be clear about whether the limiting factor is the potential for catastrophic failure or the effect on the lifespan or lifecycle cost of the infrastructure. If it is the former, then expenditure is required before access may be granted. If it is the latter, then expenditure that was planned for a future date must be brought forward, which has an effective marginal cost and needs to be considered against other competing priorities for maintenance expenditure.

5.4.1 Road geometry

As already discussed earlier in this report, road geometry should ideally not be an access barrier where a PBS vehicle is seeking access to a road with the corresponding geometric standard (e.g. a PBS Level 2A vehicle seeking access to a PBS Level 2A road or a road that is gazetted for B-double access). Despite this sensible logic, however, road access is at times not granted for PBS vehicles on roads gazetted for B-double access.

Numerous stakeholders reported what appears to be a common problem with road geometric design—that some roads currently gazetted for B-double access are no longer suitable, or were never technically suitable, for that access according to the guidelines for road classification. Those roads were initially gazetted, or continue to be gazetted despite no longer being suitable, for purely political reasons; it would be a brave political decision to de-classify a well-used B-double road that is found to be deficient, as it would have far-reaching consequences. It is relatively easy, on the other hand, to simply not grant a permit for any other type of vehicle that wishes to use the road. Applicable to both state and local road managers, this issue is a matter of tolerating the risk of B-double access and not adding to the problem by knowingly permitting more trucks. As one stakeholder put it, '*Gazetting the road for B-doubles wasn't my decision, so I can sleep at night, but granting a permit for something new is my responsibility.*'

It is apparent also that PBS road access refusal is sometimes being used as a means for attracting limited road funding.

In some cases road managers may be able to allow access by considering the performance of the actual vehicle rather than the maximum road space allowance for that class of vehicle. For example, an existing B-double road with a sealed lane width of only 2.9 metres may not be able to be classified as PBS Level 2 because the Tracking Ability on a Straight Path (TASP) standard allows Level 2 vehicles to use up 3.0 metres of lane width. If the road manager knew that the TASP of the proposed vehicle was no more than 2.9 metres, access could potentially be granted. Stakeholders have suggested that it would beneficial if road access requests from the NHVR to road managers included such performance figures for the proposed vehicle. Other examples include Startability and Gradeability. A steep grade on a road may prevent it from being classified to a certain PBS Level, but a proposed vehicle might have superior performance in that area.

5.4.2 Structures (bridges and culverts)

Bridge loading is an emotive subject that tends to get more attention than pavement loading does, because of the potential for catastrophic failure and danger to human life. Pavements do not fail so catastrophically; there is evidence in many parts of Australia of pavements operating for years in a state of disrepair, only causing discomfort to vehicle occupants and additional wear and tear on vehicles.

Around Australia there are varying degrees of concern for bridge and culvert loading by PBS vehicles. The Municipal Association of Victoria reported that bridge and culvert loading was a concern in only 6 per cent of PBS access requests handled by their members to-date. Similarly, the Local Government Association of South Australia reported that bridge and culvert loading is not a major issue in South Australia where there are few structures on the network, particularly on local roads. Nevertheless, when bridge and culvert loading is a concern in a particular PBS access request, it can be one that is difficult for local road managers to resolve.

In most cases, the stresses that would be imposed on a structure by a proposed PBS vehicle are not significantly greater than those imposed by prescriptive vehicles currently accessing the structure. They may in fact be less than those imposed by over-mass permit loads that cross it from time to time. In these situations road manager concerns often revolve more around the rate of consumption of the life of the asset than its load-bearing capacity.

Allowing general freight traffic to be more heavily loaded via the PBS Scheme, within the bounds of what is already allowed for certain combinations, will not immediately destroy structures. It may however result in a shorter lifespan and increased lifecycle cost for a structure, so as long as funding for infrastructure maintenance is not linked to productivity outcomes, a road manager may have little incentive to allow heavier loads on existing structures. Some road managers are more progressive than others in this regard.

In the growing number of cases where PBS combinations impose greater stresses in structures than those imposed by existing vehicles, the capacity of bridges and culverts is a matter that must be resolved before access may be granted. If access is not granted, it will be for one of the following reasons:

- the infrastructure capacity is insufficient
- the infrastructure capacity is unknown (either because of insufficient resources or insufficient asset data)
- the road manager does not understand the effect of the proposed vehicle on the infrastructure.

For state roads, the state road authority generally has the ability to resolve infrastructure capacity using its internal human resources and assets databases. For local roads, it is probable that the local road manager will be unable to resolve the infrastructure capacity.

One area in which the effects of PBS vehicles on structures is poorly understood is culverts and short-span simply-supported bridges. It is not uncommon for a local road manager to fear for the integrity of such structures under the loading of longer and heavier combinations such as 85.5-tonne A-doubles. The reality is that these longer and heavier combinations do not place any more demand on culverts and short-span simply-supported bridges than prescriptive vehicles, because the structures are never exposed to the entire combination at once; the axle group loads that do travel over the structure at any one time are the same as those that exist in prescriptive vehicles. In effect, A-doubles are often less of an impost than conventional B-doubles, which have consecutive triaxle groups.

There will be times when infrastructure capacity is indeed a limiting factor in a PBS access request. In these situations a local road manager would benefit from some guidance on how to assess the access request, in particular on how to accept and manage smaller margins of safety.

5.4.3 Pavements

As discussed elsewhere in this report, pavement loading is sometimes used as a reason to not grant access to a PBS vehicle, on the grounds that the pavement would not be able to sustain the additional loading caused by a heavier vehicle. It has been explained in this report that PBS vehicle axle group mass limits are the same as (and sometimes less than) prescriptive vehicle axle group mass limits, so the pavement wear effect of each axle group is no worse for a PBS vehicle than it is for a prescriptive vehicle. Further, over a whole vehicle combination, despite having a higher overall mass, the majority of PBS vehicles result in no worse pavement wear for a given freight task, because of the reduction in trip numbers required to transport the same amount of freight.

The example in Table 5.3 illustrates this by comparing a PBS Level 2B A-double combination with a benchmark semi-trailer combination. With around twice the payload capacity, the A-double requires only half the number of trips for a given freight task, resulting in around three-quarters of the pavement wear.

Table 5.3: Pavement wear comparison of PBS A-double versus conventional semi-trailer benchmark

	Semi-trailer	PBS A-double
Gross combination mass at GML (tonnes)	43.0	79.5 (185%)
Payload at GML (tonnes)	24.0	48.7 (203%)
Trips per 1,000 tonnes of payload	42	21 (50%)
Equivalent Standard Axles (ESAs) per 1,000 tonnes of payload	304	225 (74%)

Source: Adapted from Australian Trucking Association (2016)

In some unique cases, the pavement wear effect may be increased in comparison with conventional vehicles. Some PBS combinations have been approved with axle group configurations that do not comply with the PBS Pavement Vertical Loading Standard (PVLS).[7] These combinations exploit the high mass-per-axle of multiple single axles on a vehicle unit. In one extreme example, a single semi-trailer featured four single axles at 9 tonnes each (10 tonnes in Victoria). Because of the high ESA attributed to a 9- or 10-tonne single axle, even taking into account the finite freight task and the reduced number of trips the PBS combination results in greater pavement wear.

The key issue is how to recover the additional road wear costs. At the moment there is no sufficient differential in the registration charges and there is no easily administered alternative solution. Individual agreements between road managers and operators may be an option, but this would be cumbersome if it involved separate agreements with each and every road owner. Road managers may be less inclined to object to these less-road-friendly (but more productive) combinations if any increased road maintenance costs could be easily offset by increased road user charges.

5.5 Shortcomings of the Heavy Vehicle National Law (HVNL)

When the Heavy Vehicle National Law (HVNL) was introduced in 2014, it brought with it some new challenges that must be overcome if local road access is to be more easily managed.

5.5.1 Road manager consent increases burden on municipalities

The HVNL requires every road manager to consent to heavy vehicle access on its roads. This is a marked change from the way things were done prior to the HVNL, where it was possible in some cases for state road authorities to lead the way on many local road access issues. In those cases they had the resources to assess, and the power to grant, access to all roads in the state, and typically took on the more challenging aspects of the task. Municipalities were not required to house significant resources for managing road access requests, and more or less trusted the decisions made by the state road authority.

Nothing paints as clear a picture of the increased burden on municipalities as the experience of the City of Greater Dandenong. This municipality, home to industrial areas in Melbourne's south-east, received approximately 10 road access requests per annum prior to the HVNL. After the HVNL that number rose to more than 50 per week, with well over 3,000 in the first year. The situation improved when the municipality introduced access pre-approvals for the more common access types. (Pre-approvals are discussed in Section 5.5.7.) Using the existing B-double and HML networks as a basis, many roads were pre-approved for high-productivity freight vehicles and special purpose vehicles, and the administrative burden has been reduced to approximately 3-4 applications per week that are not covered by the pre-approvals.

The City of Greater Dandenong is an example of a municipality that was sufficiently resourced to find its way through; other municipalities are not so sufficiently resourced, and are having a more difficult time adjusting to the new regime.

7 The PVLS developed as part of the initial PBS reform package in 2007 was intended to be an interim standard pending the introduction of a more elaborate version that allows greater productivity. The interim standard requires axle groups to comply with conventional Australian Design Rule (ADR) definitions. It is possible to obtain exemptions from the applicable ADRs by application outside of the PBS Scheme, allowing a 'non-complying' PBS combination to be approved.

5.5.2 In-Principle Access Support has no legal status

Under the HVNL a PBS access permit may only be granted if a vehicle has a PBS Vehicle Approval. The only way that this can be obtained is by having the vehicle assessed by an accredited PBS Assessor, obtaining a PBS Design Approval, building the combination, and having it inspected by an accredited PBS Certifier. In most cases this would require an investment of $500,000 to $750,000 in new vehicle equipment, with no guarantee that access will be granted.

Consider the scenario of an applicant seeking access for an 85.5-tonne A-double on an existing 68.5-tonne B-double route. The additional 17 tonnes will be a significant factor in the decision to approve access, and access may only be possible at a lower gross combination mass for reasons of bridge loading. The reduced mass may make the proposed operation unviable. An applicant would be unable to justify the risk of proceeding with the formal process, including the construction of a brand new combination, without knowing first whether access will be granted and the mass at which it will be granted.

After receiving a large number of such requests from applicants, the NHVR established an administrative process known as In-Principle Access Support (IPAS). The purpose of IPAS is to provide an avenue for road managers to offer their support for the proposed operation ‘in-principle’, subject to the applicant going on to complete the formal approval process.

IPAS is not recognised under the HVNL. A road manager is not legally bound to respond to a request for IPAS. If they do, they are not legally bound by the statutory timeframes that apply to a permit application, there is no appeal process in the event of a refusal, and a certificate of IPAS, if obtained, is not legally binding.

A peculiar step in the IPAS process is the generation of a faux PBS Vehicle Approval certificate by the NHVR. The NHVR looks at the proposed combination and makes an educated assessment of what PBS Level the combination is expected to satisfy. A faux PBS Vehicle Approval certificate is generated for the combination and this accompanies the IPAS request that is sent out to the relevant road managers. Sometimes this certificate is inconsistent with the certificate ultimately produced for the combination, which can cause complications when the applicant finally applies for a permit.

A more efficient process for IPAS that is recognised under the law and legally binding on road managers is needed, but it will need to be carefully designed. The NHVR is currently reviewing the IPAS system.

5.5.3 No penalty for failing to resolve access within statutory timeframe

Under the HVNL there is no penalty for a road manager who fails to respond to an access request within the statutory timeframe. Therefore there is limited incentive for the road manager to respond.

Industry stakeholders support a change to the law that would make it consistent with the Airports Act 1996 (Federal Register of Legislation, 2016). This Act, which applies to Commonwealth owned and leased airports, sets out clauses in Section 81 that have the effect of approving any draft master plan submitted to the Minister by an airport-lessee company if the Minister does not respond within a given timeframe. An excerpt from the Act is shown in Figure 5.1.

Figure 5.1: Excerpt from the Airports Act 1996

81 Approval of draft by Minister

(1) This section applies if an airport-lessee company gives the Minister, in writing, a draft master plan.

(2) The Minister must:

(a) approve the plan; or

(b) refuse to approve the plan.

…

(5) If the Minister neither approves, nor refuses to approve, the plan before the end of:

(a) the period of 50 business days after the day on which the Minister received the draft plan; or

(b) a longer period (of no more than an extra 10 business days) that the Minister specifies in a written notice to the airport-lessee company;

the Minister is taken, at the end of that period, to have approved the plan under subsection (2).

Local road managers are not supportive of this approach, citing the following concerns during consultation:

- Some local road managers, including about one-third of all Victorian municipalities, are not authorised to make certain road access decisions without consulting councillors, which takes more time than is generally available to respond. Those road managers feel that to modify council protocols to satisfy such a change to the law may undermine the intent of those protocols.
- Some local road managers believe that the proposed approach may result in unintended approvals that risk public safety.
- Some local road managers had experienced bureaucratic errors within the NHVR in which the NHVR was unaware that responses had been given, so they feel that there is insufficient robustness around current processes to ensure that approvals would not be mistakenly given under such an approach.
- Some local road managers are so under-resourced in this area that they have only one member of staff with the capacity to deal with road access requests, and that person has so many other responsibilities that they are only available for that task on (say) one particular day of the week. In one example, the consenting officer could only afford to spend three hours per week on road access requests. Refer to Section 5.8.3 for more on this subject.

5.5.4 Acceptable reasons for access refusal are too broad

Under Section 156(3) of the HVNL (Figure 5.2) a road manager may refuse access for a PBS vehicle on one of three grounds, and only if access cannot be granted with risk-mitigating conditions.

Figure 5.2: Section 156(3) of the HVNL

The road manager may decide not to give the consent only if the road manager is satisfied—

(a) the mass or dimension authority will, or is likely to—

(i) cause damage to road infrastructure; or

(ii) impose adverse effects on the community arising from noise, emissions or traffic congestion or from other matters stated in approved guidelines; or

(iii) pose significant risks to public safety arising from heavy vehicle use that is incompatible with road infrastructure or traffic conditions; and

(b) it is not possible to grant the authority subject to road conditions or travel conditions that will avoid, or significantly minimise—

(i) the damage or likely damage; or

(ii) the adverse effects or likely adverse effects; or

(iii) the significant risks or likely significant risks.

When refusing access, a written statement must be provided that complies with Section 172 (Figure 5.3).

Figure 5.3: Section 172 of the HVNL

(1) This section applies to a written statement explaining a decision of a relevant road manager under this Division—

(a) not to give consent to the grant of a mass or dimension authority (as referred to in section 156); or

(b) to consent to the grant of a mass or dimension authority on the condition that—

(i) a road condition is imposed on the authority (as referred to in section 160); or

(ii) a travel condition is imposed on the authority (as referred to in section 161).

(2) The written statement complies with this section if it—

(a) sets out the findings on material questions of fact, referring to the evidence or other material on which those findings were based and giving the reasons for the road manager's decision; and

(b) identifies every document or part of a document that is relevant to the road manager's decision and is—

(i) in the road manager's possession; or

(ii) under the road manager's control; or

(iii) otherwise available to the road manager.

It is apparent that some road managers are using the grounds in Section 156(3) without sufficiently compelling reasons per Section 172. For example, a road manager might not grant access for a Level 2B vehicle on a Level 2A road because of an apparent risk to public safety without detailing what it is about the road that prevents it from safely accommodating a Level 2B vehicle.

One jurisdiction has for some time held the policy position that access to 30-metre combinations on a major intercapital road will be restricted until the entire road has been duplicated, on the grounds of mitigating risk to public safety. A transport operator who sought access to the first 10 kilometres of the road, which is fully duplicated, was advised that access would not be granted on the basis of this policy position. This was done under Section 156(3)(a)(ii) ("…or other matters stated in approved guidelines"). The Approved Guidelines for Granting Access (National Heavy Vehicle Regulator, 2014) reference "strategic plans" as suitable reasons. The exact nature of the safety risk in this case was not addressed.

5.5.5 Appeals process does not include an independent review body

When an applicant for road access for a PBS vehicle is dissatisfied with the quality of a decision by a road manager, the applicant's only avenue for appeal is to request, via the NHVR, a review of the decision.[8] Such reviews are conducted by others within the road manager's organisation, and not an independent, external body such as a Civil and Administrative Appeals Tribunal.

The Australian Trucking Association's submission to the Queensland Parliamentary Transport and Local Government Committee on the Heavy Vehicle National Law Bill 2012 (Australian Trucking Association, 2012) referred to a report by the Australian Government's Administrative Review Council (2000) detailing numerous problems with internal reviews, including:

- the reluctance of senior workers to overturn the decisions of people they supervise closely. This problem is likely to be particularly acute in small organisations like local councils, where the reviewer could be the immediate supervisor or a colleague at the same level as the primary decision-maker;
- a real risk that the internal review will not be objective;
- inconsistent appeal outcomes. One of the objectives of an appeals system is to make sure that people in the same circumstances are treated in the same way, regardless of the primary decision-maker. This means that appeals need to be considered centrally, not by appeal officers located in the same office as the primary decision-maker;
- the failure of internal reviews to consider whether policies are appropriate. Internal reviews only consider if a primary decision maker applied an organisation's policies or interpretation of the law correctly; they are most unlikely to go to back to fundamentals.

5.5.6 Existing access arrangements in New South Wales are no longer available

Prior to HVNL implementation, Roads and Maritime Services New South Wales (RMS) worked under a ministerial delegation that gave RMS the power to issue permits for access to any road in New South Wales, including local roads. Under this delegation the following PBS combinations were provided with network access in New South Wales:

- PBS 3-axle truck and 4-axle dog combinations ('Quad Dogs'):
  - PBS Level 1 – 50.5 tonnes – General Access subject to signposted restrictions
  - PBS Level 2 – for masses above 50.5 tonnes and up to 57.5 tonnes – HML B-double network, requiring participation in the Intelligent Access Program
- PBS 3-axle truck and 5-axle dog combinations ('Quin Dogs'):
  - PBS Level 2 – 59.5 tonnes – 25/26-metre RAV B-double network
  - PBS Level 2 – for masses above 59.5 tonnes and up to 63.0 tonnes – HML B-double network, requiring participation in the Intelligent Access Program
- PBS 20-metre prime mover and triaxle semi-trailer combinations:
  - PBS Level 1 – 43.0/44.0 tonnes – General Access subject to signposted restrictions
  - PBS Level 1 – 46.5 tonnes – HML Short Combination network, requiring participation in the Intelligent Access Program
- PBS 19/20-metre prime mover and quad axle semi-trailer combinations:
  - PBS Level 1 – 43.0/44.0 tonnes – General Access subject to signposted restrictions
  - PBS Level 1 – 46.5/50.5 tonnes – HML Short Combination network, requiring participation in the Intelligent Access Program

8 Furthermore, there is no avenue at all for appealing decisions on In-Principle Access Support.

- PBS 26-metre B-doubles:
  - PBS Level 2 – 63.0/65.0 tonnes – 25/26 m RAV B-double network
  - PBS Level 2 – 68.5 tonnes – HML B-double network, requiring participation in the Intelligent Access Program.

When an operator of one of the above PBS combinations sought access outside of the approved network on a local road, RMS coordinated consultation with the relevant council and obtained their approval for the route prior to issuing a new permit with the requested route. All other PBS combinations were assessed for access on the state roads and sent to the relevant council for their assessments. A permit including local road access was issued upon advice from the council.

After HVNL implementation, RMS no longer had the legal power to consent to access to local roads as described above. Existing permits continued to have effect but no new permits could be issued without the express consent of the council in every case.

When the National Class 2 PBS Level 1 & 2A Truck and Dog Trailer Authorisation Notice 2016 (No. 1) was released (Commonwealth of Australia, 2016), it referred to Level 1 and Level 2A road networks in New South Wales that were missing many of the previously approved local roads. This affected many applicants who ordered brand new PBS combinations shortly before the Notice was published, on the understanding that they would have the same access as existing permit-holders.

The relevant excerpt from the Notice is shown in Figure 5.4.

Figure 5.4: Excerpt from the Class 2 PBS Level 1 & 2A Truck and Dog Trailer Authorisation Notice

Schedule 2 New South Wales

1 Stated areas or routes

(1) The **PBS Level 1 network** mentioned in section 8(1) of the body of this Notice includes all areas or routes in the "PBS Level 1 GML and CML Network" maps set out in Appendix 1(a), subject to compliance with any listed conditions applicable to the area or route.

(2) The **PBS Level 2A network** mentioned in section 8(2) of the body of this Notice includes all areas or routes in the "PBS 2A GML and CML Network" maps in Appendix 1(a), subject to compliance with any listed conditions applicable to the area or route.

(3) The **HML network** mentioned in section 8(3) of the body of this Notice includes, subject to compliance with any listed conditions applicable to the area or route—

(a) for a PBS truck and dog operating at PBS Level 1, all areas and routes in the 'PBS Level 1 HML Network' set out in Appendix 1(a); and

(b) for a PBS truck and dog operating at PBS Level 2, all areas and routes in the 'PBS 2A HML Network' set out in Appendix 1(a).

…

Appendix 1

a) New South Wales Performance Based Standards (PBS) Maps: http://www.rms.nsw.gov.au/pbsmap

5.5.7 Permit pre-approvals being favoured over National Notices

A National Notice, such as that discussed in the previous section, is a method for granting large-scale road access in lieu of individual permits. National Notices can greatly reduce the regulatory burden on both road managers and transport operators. Prior to the HVNL, Notices were published by each state and territory. They were printed in hardcopy and often became out-of-date soon after publication if roads were added to or subtracted from the list approved for vehicles under the Notice. Under the HVNL, National Notices point to online electronic maps of approved routes, which are published on the individual jurisdictions' websites and are updated regularly.

A process that has become popular under the HVNL is permit pre-approval. Permit pre-approval, which sits between National Notices and individual permits on the spectrum of regulatory burden, allows a road manager to advise the NHVR that any permit applications falling within an acceptable envelope may be automatically approved by the NHVR without consulting the road manager. This reduces the burden on the road manager; in the example discussed earlier, the City of Greater Dandenong has reduced its permit approval workload by an order of magnitude using this approach.

A benefit of permit pre-approval over a National Notice is that the road manager receives a copy of every permit issued under the pre-approval, while a National Notice allows no such monitoring. This also retains a degree of control of access because a permit may be cancelled.

Permit pre-approvals have no effect on the regulatory burden on transport operators.

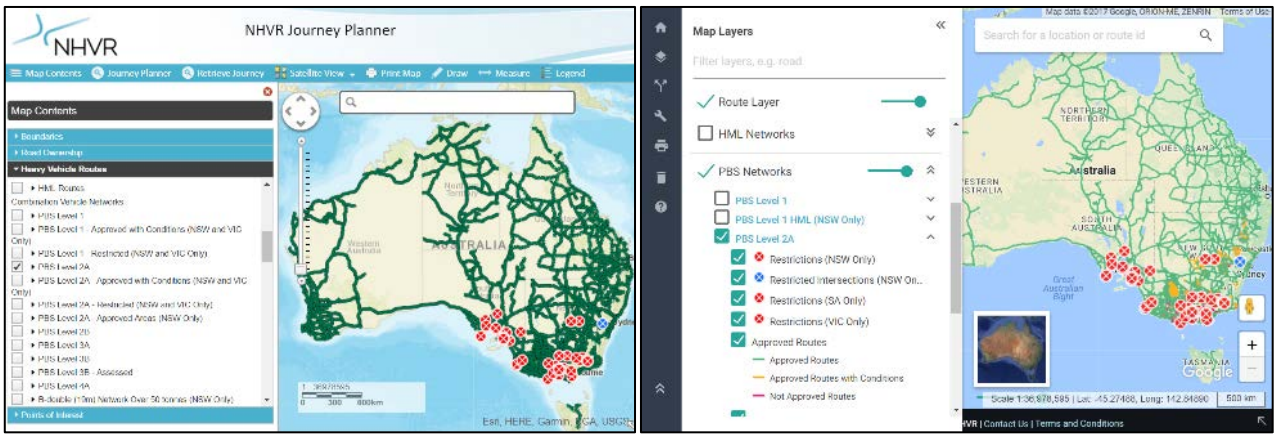
5.6 Shortcomings of NHVR online tools

The NHVR has developed online network mapping and route planning tools and a permit application and tracking portal for heavy vehicle operators. These tools are under ongoing development and, at present, have some shortcomings that are acting as a barrier to local road access.

5.6.1 Journey Planner and Route Planner do not route heavy vehicles properly

The NHVR website features a mapping tool known as the Journey Planner (Figure 5.5(L)). It provides public access to maps of the various heavy vehicle restricted access networks and allows transport operators to plan and save proposed journeys. The Journey Planner is expected to be replaced by an improved mapping tool known as the Route Planner (Figure 5.5(R)), which is based on the Google Maps platform. A Beta version of the Route Planner was available in early 2017 at the URL http://rp.nhvr.net/. It was removed from service but another version can now be accessed via the NHVR Portal. The issues discussed in this section apply to both mapping tools.

Figure 5.5: (L) NHVR Journey Planner, (R) NHVR Route Planner (Beta)



Source: (L) http://gis.nhvr.gov.au/journeyplanner/, (R) http://rp.nhvr.net/ (accessed 20 May 2017)

Neither mapping tool has route planning capability that sufficiently caters for PBS combinations; when seeking directions from one address to another, there is nowhere for the user to enter the vehicle configuration, its PBS classification, or its overall dimensions. The Route Planner has limited functionality for prioritising certain types of roads. Town bypasses, which are known to the tools, are not given automatic priority. As a result, by default the tools appear to simply plot the most sensible route for a passenger car, which may not be the best route for the proposed heavy vehicle.

It is up to the transport operator to ensure that proposed routes are sensible by adding waypoints to direct the route the most appropriate way. Sometimes this may not be done correctly by the operator, if at all, and when the permit application reaches the road manager there is a potential barrier to access; the road manager will either not approve the application on the grounds that the route is inappropriate, or they may have to spend additional time to determine a more appropriate route.

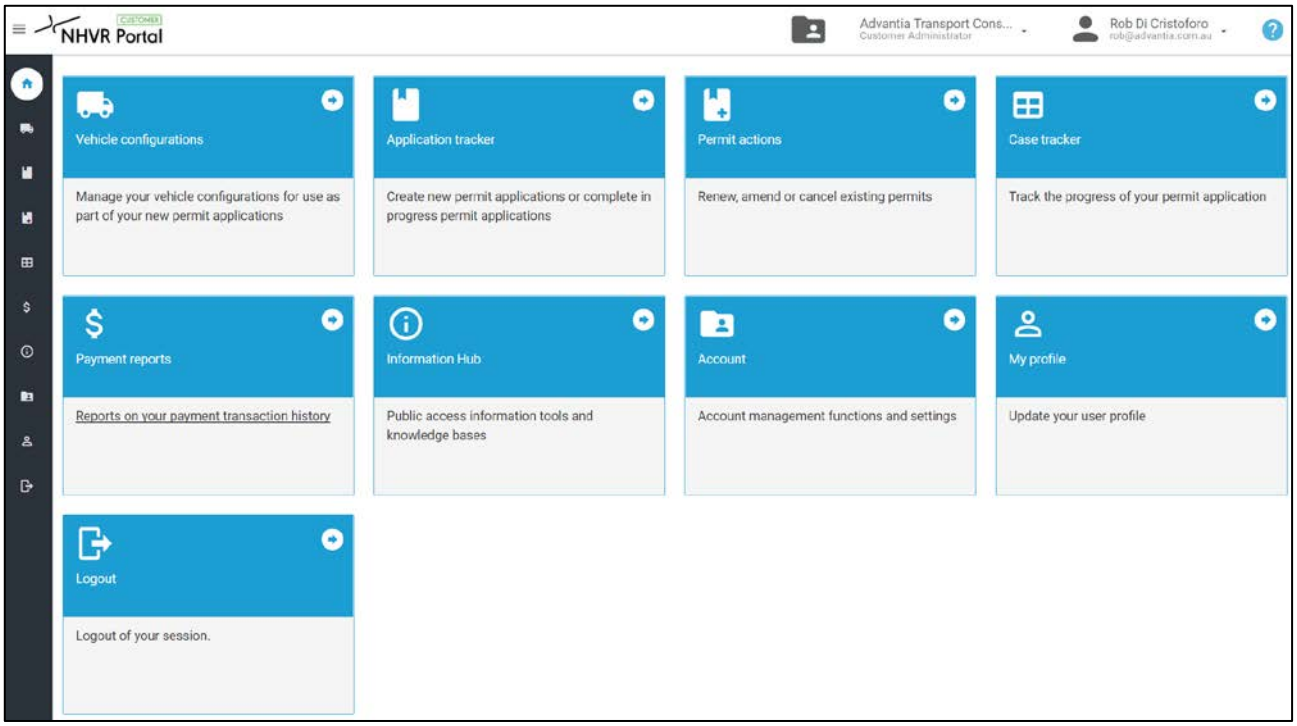
The NHVR, as a facilitator in the process, has an opportunity to correct the routes or seek better suggestions from the applicant before sending requests to road managers. This does not appear to be happening. The best solution would, of course, be for the tool to do that work automatically, such that the NHVR only has to perform basic checks before passing the request on to the road managers.

A further shortcoming of the NHVR online mapping tools is their latency in comparison with similar tools hosted on the websites of individual jurisdictions. Some state road authorities have online mapping tools that are more sophisticated than the NHVR tools, and more up-to-date. For example, the VicRoads online maps are updated weekly but the changes are reflected on the NHVR maps about six weeks later.

5.6.2 NHVR Portal

The NHVR Portal – Customer Module (Figure 5.6) is a means by which transport operators may apply for permits and track the progress of permit applications. The NHVR Access Team has full control of the backend of this tool.

Figure 5.6: NHVR Portal – Customer Module



Source: https://www.service.nhvr.gov.au/ (accessed 27 August 2017)

The Customer Module has a high degree of sophistication but until the recent release of the Road Manager Module it was not linked directly with road managers. NHVR officers were required to transfer the information in the Customer Module to road managers by email. The new Road Manager Module provides a direct link between road managers and relevant permit application data.

Because the NHVR was communicating with road managers by email, some parts of a permit application or In-Principle Access Support application were inadvertently left out due to human error. In one case, a letter was uploaded to the Customer Module as part of an application for In-Principle Access Support (IPAS). The letter provided Route IDs for both directions of a proposed point-to-point operation, because the Customer Portal only allows one Route ID to be entered and there was a slight difference in the roads accessed on the return journey. The letter was not sent to road managers. Instead, road managers were given the Route ID for the one direction that was entered into the Customer Module, with the instruction 'return via same.' When the NHVR Access Team was contacted to rectify this, officers had no knowledge of the letter having been uploaded. It was ultimately found in the system and the IPAS was corrected. This added about two weeks to the process. The new Road Manager Portal is expected to prevent future such occurrences.

Local road managers expressed a view that their role in PBS vehicle access decision-making would be much easier, and they would be much more likely to grant access to a proposed PBS vehicle, if they had better information about the intended operation. For example, rather than receive an application stating that a transport operator wishes to operate a 30-metre PBS Level 2B combination on a particular route, local road managers would prefer to have an optional summary statement indicating such things as:

- The freight being transported
- The amount of freight transported per week
- How the freight is being transported presently (by prescriptive vehicles)
- How the proposed PBS vehicle improves freight productivity
- The number of heavy vehicle trips saved per week
- The local businesses or industries involved
- How the local community will benefit.

Where there is a significant benefit to the local community, such as through cost savings for local businesses or amenity improvements due to reduced heavy vehicle traffic, a local road manager will be more willing to make a risk-based decision and find a way to allow access. The benefits can be more easily sold to councillors and the broader community, and alternative options will be more readily proposed if the requested option is not suitable.

The current operation of the NHVR Portal does not allow this level of communication to occur with local road managers, and there is evidence of the system failing applicants.

5.7 Non-existent or inequitable cost recovery solutions

Providing access for high-productivity freight vehicles may impose costs on local road managers that must either be absorbed by the council or recovered from the beneficiary companies. With no existing nationally-implemented enabling solutions, cost recovery is being implemented in different ways across the country, resulting at times in significant inequity. State road authorities are leading the way, but demonstrating marked differences in the way that costs are absorbed or recovered. In some cases cost recovery is the lubricant that enables an access decision to be made, while in others it is a disincentive that stops an application in its tracks.

While cost recovery solutions are not yet in place, governments—including at the local level through the Australian Local Government Association—are engaged in the Heavy Vehicle Road Reform (HVRR) process endorsed by the Council of Australian Governments (COAG). HVRR is a long-term microeconomic reform that aims to improve the efficiency and sustainability of funding arrangements for road infrastructure. The reform aims to achieve this by better linking heavy vehicle road use with the charges paid by heavy vehicle operators, aligning charges with investment in the road network to support heavy vehicle services.

The reform process is following a roadmap, endorsed by the Transport and Infrastructure Council, setting out a practical, incremental reform pathway, noting that policy decisions contained within it are subject to the agreement of governments. Over time, the reform will provide governments with the option to improve access for large vehicles and oversize loads across their road networks. This is because HVRR will provide mechanisms (such as a forward looking cost base and dedicated road infrastructure funding) to recoup the costs of heavy vehicle road use across the road network. Businesses could, for example, be granted improved access to first and last mile connections.

Transport and Infrastructure Council (2017b) contains further details of the HVRR process.

5.7.1 Infrastructure upgrades

At times it is necessary to upgrade infrastructure to enable high-productivity freight vehicle access. Austroads (2015) presents a framework for private sector investment in such upgrades. The report reasons that faster asset consumption can be beneficial if properly funded:

> *One of the things that has been lacking in considering HPV access to date is a commercial view of the road network as a commodity where additional use of the commodity can be paid for, rather than as a right to use through standard payment, or restriction to use based on service life maximisation. As long as broader impacts such as public amenity and road safety issues are properly addressed, it should be possible to deplete a road asset's service life more quickly, as long as that use is properly compensated.*

The report also describes the need to enable private investment as a way of providing that funding:

> *The current system of allocating public funding cannot address all situations where individuals may seek to improve freight access for the benefit of a single or small number of individuals. Therefore, where private industry identifies an upgrade need in order to accommodate their business operations, there should be an opportunity for it to invest in public roads directly where it is a primary beneficiary of the upgrade.*

Importantly, the framework is suited to situations where "a single or small number of individuals" will benefit from the investment. When comparing local road infrastructure upgrades with state-managed arterial road upgrades, it is far more likely that only a single or small number of individuals will benefit. In reality, however, the number of beneficiaries is probably going to be greater than the number of individuals offering to fund the upgrade, and the upgrade may in many cases cost far more than the benefit enjoyed by the small number of individuals who fund it.

The types of infrastructure upgrades that stakeholders reported to have been successfully implemented on private sector funding include:

- kerb realignment at intersections
- turning lanes and driveways into private properties
- resurfacing works.

The types of infrastructure upgrades that are more likely to be required as PBS Level 2B (Tier 2/3) vehicles continue to proliferate include costly bridge strengthening and replacement, among others. These upgrades are unlikely to be funded by transport operators or their customers unless the funding is collected on a large scale through facilities such as Mass-Distance-Location (MDL) charging.

5.7.2 Infrastructure capacity assessments

Where a road manager is required to consider infrastructure capacity as part of a heavy vehicle access decision, particularly the structural capacity of bridges, a considerable amount of professional engineering time may be required. The cost of this time will vary depending on the number of structures involved and the methods that can be used to perform the assessment. For example, network-wide assessments can use simplified models because the engineer only needs to compare the bridge loading effects of the PBS vehicle with those of acceptable benchmark vehicles. Specific route assessments, on the other hand, require individual bridge characteristics to be taken into consideration to maximise the load that can be approved on those specific structures which may be of a higher standard than the worst-case on the network. Regardless of the methods used to conduct assessments, the way that the cost of this time is currently being recovered differs greatly between road managers. Taking state road authorities as an example:

- One state road authority fully absorbs bridge assessment costs. The bridge assessment team is now beginning to be overwhelmed by an increasing number of road access applications, each of which can have implications for a considerable number of bridges. Most of these applications require three to six months of elapsed time to resolve. In some cases, where the application is a speculative 'in-principle' request, several transport companies might apply for the same access as part of a competitive tender for the same transport contract. This increases the workload for the road authority to a level much higher than that required to manage the task that is required in reality. This situation is putting pressure on the road authority to consider charging for bridge assessments.
- Another state road authority charges a fixed nominal fee of several hundred dollars to conduct a bridge assessment. This approach is effectively no different to the previously described approach, except that the nominal fee provides a level of defence against the most frivolous and speculative access requests. The actual cost of the bridge assessment will in most cases be much more than the fee charged, so there is some level of absorption of the bridge assessment cost. Each applicant is charged the same amount, so there is little prospect of complaints arising in relation to the equity of the process, unless an applicant insists that they should not be charged for an assessment that is ostensibly identical to one previously conducted for another applicant.
- Another state road authority charges a market rate for each bridge assessment that is quoted in advance, based on the complexity of the task, so that full cost recovery is achieved. These fees can vary from a few thousand dollars for a single vehicle on a single route involving a small number of bridges to tens of thousands of dollars for numerous vehicle configuration options accessing many routes involving many bridges. The fees are quoted and charged for every assessment, even if a different company seeks the same access for an almost identical vehicle. Evidently this approach is not delivering the resource capacity and level of service that may reasonably be expected when paying market rates. In many cases it takes weeks or months to receive the quote and weeks or months more to have the work completed. The cost of these assessments makes it difficult for transport companies to justify continuing in many cases.

The equity of charging for bridge assessments should be carefully considered by any road manager, especially where there is any chance that the fees charged to applicants ultimately exceed by a significant amount the costs of providing the service.

The most difficult aspect of designing a cost recovery system is deciding on how to make the system equitable in cases where an assessment conducted for one company (and charged to that company) can act as the basis for a subsequent access request by another company. Should the road manager charge each company the same as they did the first (i.e. the full cost of the original assessment every time), on the grounds of being equitable, resulting in gross overcharging? How can the road manager be sure of whether (and how many) future applications will be received, so that lower fees can be spread over numerous assessments?

This topic is difficult enough for state road authorities to contend with, let alone small municipalities. A cost recovery framework that can be implemented nationally by road managers at all levels appears to be worth considering.

5.8 Lack of resources and tools

5.8.1 Route assessment guidelines

The PBS Network Classification Guidelines (National Transport Commission, 2007) are the official guidelines for determining whether a PBS vehicle of a particular Level (1-4) and Class (A or B) should be allowed to operate on a road. They were intended to be the basis on which road managers classified and mapped their networks when the PBS Scheme commenced.

Local road managers expressed their concerns during the consultations about the lack of detail in the Network Classification Guidelines. For example, the guidelines focus on vehicles travelling along a road, and not specifically on vehicles accessing sites on a road when commencing or completing journeys. In these last-mile situations, some local road managers are unsure of how to consider the potential safety aspects of longer vehicles turning into and out of properties; vehicles may be required to briefly cross the road centre-line to make a sharp left-hand turn so that they can fit through a narrow gate, or they may not be able to turn around inside the property and re-enter the road in a forward direction. One local road manager routinely requests swept path assessment of vehicle entries and exits, including the ability to turn around onsite.

Given the apparent lack of completeness of the guidelines, and the resources available to state road authorities, some state road authorities have developed their own versions of the guidelines over the years, or supplementary documents that provide the additional detail. Local road managers, meanwhile, have had to make do with the original document in isolation.

The Local Government Association of South Australia did develop route assessment guidelines for its members, but they did not specifically target PBS vehicles. Those guidelines were designed for heavy vehicle access decision-making generally, and as a result were too light on detail for PBS use. Deciding on access for PBS vehicles using those guidelines would require too much engineering judgement and would result in unacceptable risks for road managers.

Local road managers in general are reluctant to make road access decisions where a risk-based engineering judgement is required. If there is no written guideline from which to work, or if a guideline has insufficient detail to deal with a particular issue, it is unlikely that all local road managers will treat PBS vehicle access decisions in the same way, if at all. The Local Government Association of Queensland has embarked on a project to develop risk-assessment guidelines for road access decisions; this, however, is something that should ideally be done at a national level for use by state road authorities and local road managers alike. Local road managers in particular are in need of a nationally co-ordinated source of reliable, accessible information to enable them to do their jobs confidently.

5.8.2 Restricted Access Vehicle Route Assessment Tool (RAVRAT)

The Restricted Access Vehicle Route Assessment Tool (RAVRAT) is a software tool developed by ARRB Group, with funding from state road authorities and Local Government Associations, that has made the task of PBS road classification easier and more consistent for local road managers. It does, however, have its limitations. In short, the tool takes the PBS Network Classification Guidelines and puts an interactive user interface in front of them, so that a road manager simply enters information into the appropriate fields to complete a desktop assessment of a road in 15-20 minutes, provided the relevant information about the road is available for entry. As described on the RAVRAT website (ARRB Group, 2017):

> *The RAV Route Assessment tool has been developed as an expert tool for Local Government practitioners, and is intended to allow heavy vehicle route assessments to be completed in line with PBS route classification guidelines. Use of this expert system results in the consistent application of a heavy vehicle route assessment process across Local Government jurisdictions, that facilitates certainty of operations for industry and ensures that the heavy vehicles that are granted access to local roads are able to safely operate in that environment.*

Stakeholder consultation revealed that the RAVRAT is not a complete solution for PBS road classification. It is only a means to an end, effectively determining the classification of a road against the established guidelines based on the information fed into it by the user. It does prompt the user for the appropriate information, but the user is somehow required to acquire that information. This involves working from design drawings or making site visits, which can be labour-intensive and in many cases is responsible for the majority of the time spent conducting route assessments.

Importantly, the RAVRAT does not make determinations on swept path or bridge and pavement loading, which are areas in which local road managers need the most assistance. These are major limitations of the tool.

Nevertheless, stakeholders expressed concerns about the future viability of the RAVRAT, citing potential changes to the way the tool will continue to be funded. Without the RAVRAT, local road managers will rely more heavily on support from state road authorities, and may struggle to meet statutory timeframes for access decisions.

5.8.3 Human resources

Given the matters discussed in Section 5.5.1, the human resources available within municipalities for conducting heavy vehicle access decision-making are extremely stretched.

Some regional councils have only one person who is capable of making heavy vehicle access decisions, and that person will typically have various other responsibilities that take up significant amounts of their time. In these situations, whenever the relevant person is away from work either on leave or due to illness, access decisions may not proceed. It may be possible to train another staff member to provide backup at these times, but due to their infrequent immersion in the role a backup person is unlikely to be sufficiently fluent to be able to make good decisions efficiently.

Matters can be a lot worse in municipalities that cover a large area, where it may be necessary to drive long distances to inspect roads as part of an access decision. This takes somebody away from their job for a day to perform a task that might only require an hour on site.

It was noted during the consultations that road access decisions involving both state and local road managers sometimes inexplicably result in local road managers approving access unconditionally while state road authorities issue a list of reasons why access cannot be granted. There is a view that local road managers are sometimes taking a risk and approving access for the benefit of the community, despite not having the resources to perform the desirable checks; state road authorities, on the other hand, with their larger selection of human resources and tools for performing route assessments, are generally better-equipped for looking more closely and identifying technical barriers to access.

In New Zealand, heavy vehicle productivity reforms were enabled through the 2010 amendment to the Land Transport Rule: Vehicle Dimension and Mass, which allowed for the introduction by way of permit High Productivity Motor Vehicles (HPMVs, which include ‘50MAX’). To assist with the implementation of high productivity the New Zealand Transport Agency made grants of 100 per cent available from the National Land Transport Fund for initial engineering assessments of local networks. Funding these assessments would have been a particular problem for councils given that in this case the regulatory reform fell in the middle of the local government funding cycles, meaning little discretionary rate-payer resources were available in their budgets.

5.9 Perception of negative impact on amenity

Amenity is more likely to come up as a barrier to local road access for high-productivity freight vehicles in inner-city areas where residents are less likely to acknowledge the role that heavy vehicles play in supporting their way of life. In contrast, in rural and remote areas people generally appreciate the fact that heavy vehicles road access is essential for the local industry.

It can be difficult to convince residents in a built-up area that larger trucks will improve the amenity of their community by reducing the number of vehicle movements. With the freight task growing constantly, a better message might be that using larger trucks may not result in a reduction in truck movements *per se*, but will certainly result in fewer truck movements than there otherwise would have been.

Take the inner-west of Melbourne, for example, where some residential areas are subject to bumper-to-bumper container truck traffic accessing the Port of Melbourne and nearby empty container parks. It would be difficult for someone without an intimate understanding of the heavy vehicle industry to imagine how larger trucks would somehow result in noticeably fewer trucks.

The roads in Melbourne's inner-west are a notorious battle-ground for the City of Maribyrnong. Notably, while the 30-metre-long PBS combinations that have been operating in the area for many years are confined to state-managed arterial roads, the local council has been vocal in its opposition to larger heavy vehicles on those roads purely out of support for its ratepayers. These roads are now subject to a weeknight curfew from 8:00 PM to 6:00 AM, and a weekend curfew from 1pm Saturday to 6am Monday.

Schools in the area have been used to emotively demonstrate the impact of truck traffic on amenity at school pick-up and drop-off times. The Maribyrnong Truck Action Group has posted numerous videos online depicting loud trucks rumbling past, within metres of young children. There is a risk of increasing community pressure to expand the curfews to incorporate school times as well, which would practically cripple the industry and have untold effects on Victoria's economy.

When there is a general aversion to heavy vehicles within a local community, there is an increased likelihood that the local road manager will not grant access to PBS vehicles simply because it is within their power to do so, and because it is an easier path than trying to convince residents of the benefits of the PBS vehicle, or defending access approval when residents complain after the fact.

5.10 Lack of economic incentive for the community

There is never any question about whether providing appropriate road access for PBS vehicles has positive economic benefits for Australia or for the relevant state or territory of operation. There is, however, some uncertainty within local councils about whether their particular municipality will benefit economically from a given road access decision in their jurisdiction, and this can sometimes be a barrier to access. Some councils prefer not to grant access without there being a clear economic incentive for the community, because of a perception that granting access imposes some kind of cost on the community.

Local road managers expressed concerns about 'rat-running', where transport companies seek access to local roads purely as a shortcut or link to another road, or to a destination in the adjoining municipality.

A PBS vehicle may seek access to a local road to access a particular site on that road or in that estate. It may be delivering raw materials to a local factory, or picking up finished products from that factory to be transported to its customer. In these situations it is reasonable to assume that the factory will benefit somehow from the access, either from a saving in the cost of bringing in raw materials or from a saving in the cost of transporting the finished products. The final destination of the savings is a function of the ownership structure of the factory; if the shareholders are not local residents, then there is arguably no benefit to the local community. In a different scenario, if the transport company acquired the PBS vehicle with no intention other than to increase its own profits, without passing the savings on to the factory, then the benefits will flow to the transport company's shareholders, who also may not live within the municipality.

6. Case Studies

This section presents a number of access decisions that initially faced barriers of the kind described in the previous section, but were ultimately successful for various reasons. Each case study features an introduction describing the access sought, a statement of the problem faced by the road manager, a description of how the problem was overcome, and the key lesson learned.

The case studies cover the following subjects:

- Low-speed swept path (two case studies)
- Intersection clearance
- Route compliance
- Road user charging
- Bridge loading assessment
- Explaining benefits to stakeholders.

Despite there being plenty of practical examples of barriers to road access for high-productivity freight vehicles, the number that involve local roads and were ultimately resolved in a manner suitable for study in this report is limited. It was also intended to provide case studies with a range of flavours, so numerous similar case studies were not included.

6.1 Case study #1 – Swept path template versus actual performance

Introduction

The proponent is a parcel freight transport company that routinely operates B-triple combinations between Perth, Adelaide and Darwin. The B-triples may not operate between Adelaide and Melbourne, so the company sought access for B-doubles made by de-coupling the rear trailers from the B-triples. The resulting combinations, each comprising two 16-pallet lead trailers, would be around 27 metres long and therefore would not be complying 26-metre B-doubles.

The company obtained a PBS Design Approval covering several potential 27-metre B-double combinations involving various similar prime movers and trailers. The swept path width of these combinations was around 9.2 metres. Given that the Level 2 swept path width limit is 8.7 metres maximum and the Level 3 swept path width limit is 10.6 metres maximum, the combinations were approved at Level 3. Swept path width was the only performance standard satisfied at Level 3; all other standards were satisfied at either Level 1 or Level 2. Therefore, apart from the slightly increased length, the combinations were considered suitable for operation on the B-double network as long as swept path could be accommodated where the vehicle performed any low-speed turns.

The company sought access to a specific direct route on the existing B-double network, from an address in Melbourne's west to an address in Adelaide's north.

The first problem

For the Victorian component of the journey, VicRoads granted access from the company's address in Melbourne's west along the most direct route to the border of Victoria and South Australia. This route did not have a pre-existing PBS road classification, so VicRoads conducted a route assessment especially for the company. For the South Australian component of the journey, given the Level 3 vehicle classification the Department of Planning, Transport and Infrastructure (DPTI) granted access to the pre-existing Level 3A network in South Australia. This differed significantly from the requested route. It did not provide connectivity with the Victorian component that was already approved, and in any case it required a very large detour via Broken Hill. Further, the New South Wales Level 3A network has a missing link between Broken Hill and the South Australian border (Figure 6.1). The access was therefore not viable for the operator, and the case was closed.

Figure 6.1: Level 3A network shown with intended journey from Melbourne to Adelaide

Source: NHVR Journey Planner, http://gis.nhvr.gov.au/journeyplanner/ (accessed 9 August 2017)

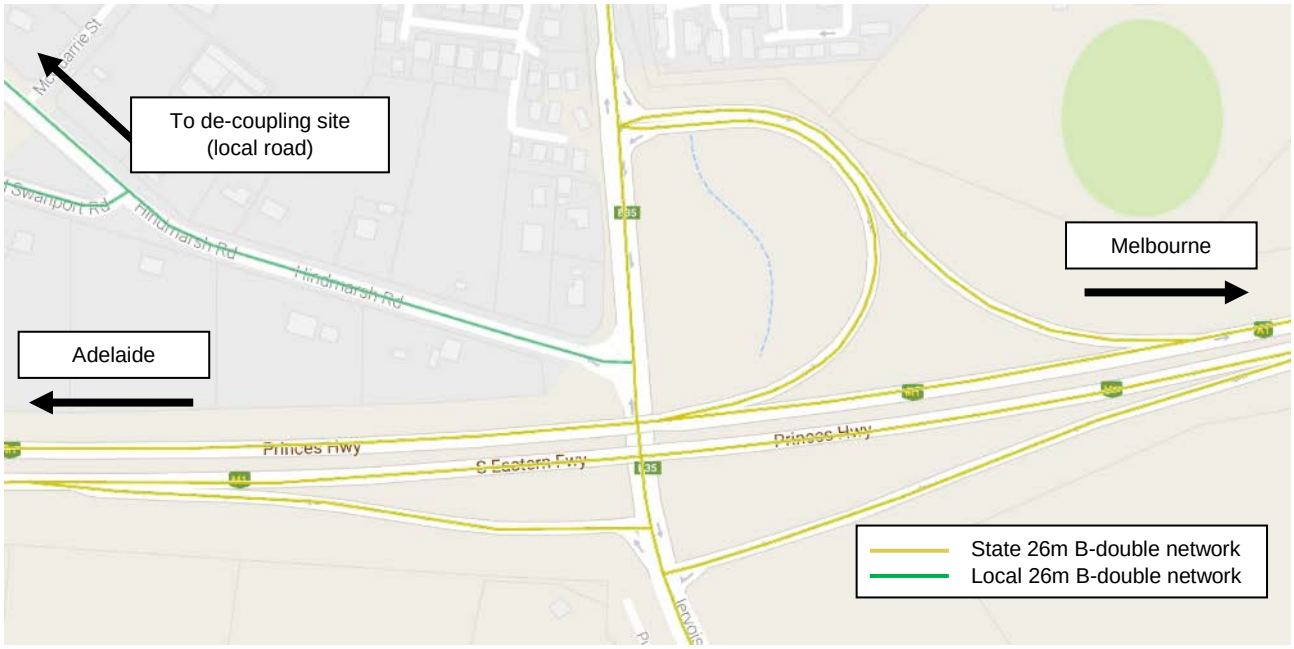
The solution to the first problem

The company investigated whether the direct route could be approved if the combination was de-coupled before entering Adelaide. DPTI participated in discussion despite the case having been closed. The company proposed a rest area as a de-coupling site but DPTI did not consider that to be a viable option; DPTI requested that the company nominate a suitable de-coupling site on private property. The company identified a private address for de-coupling in Murray Bridge.

The second problem

The proposed de-coupling site was on Hindmarsh Road, a municipal road close to the Princes Highway (M1) that is gazetted for 26-metre B-doubles (Figure 6.2).

Figure 6.2: Road classifications around de-coupling site on Hindmarsh Road, Murray Bridge

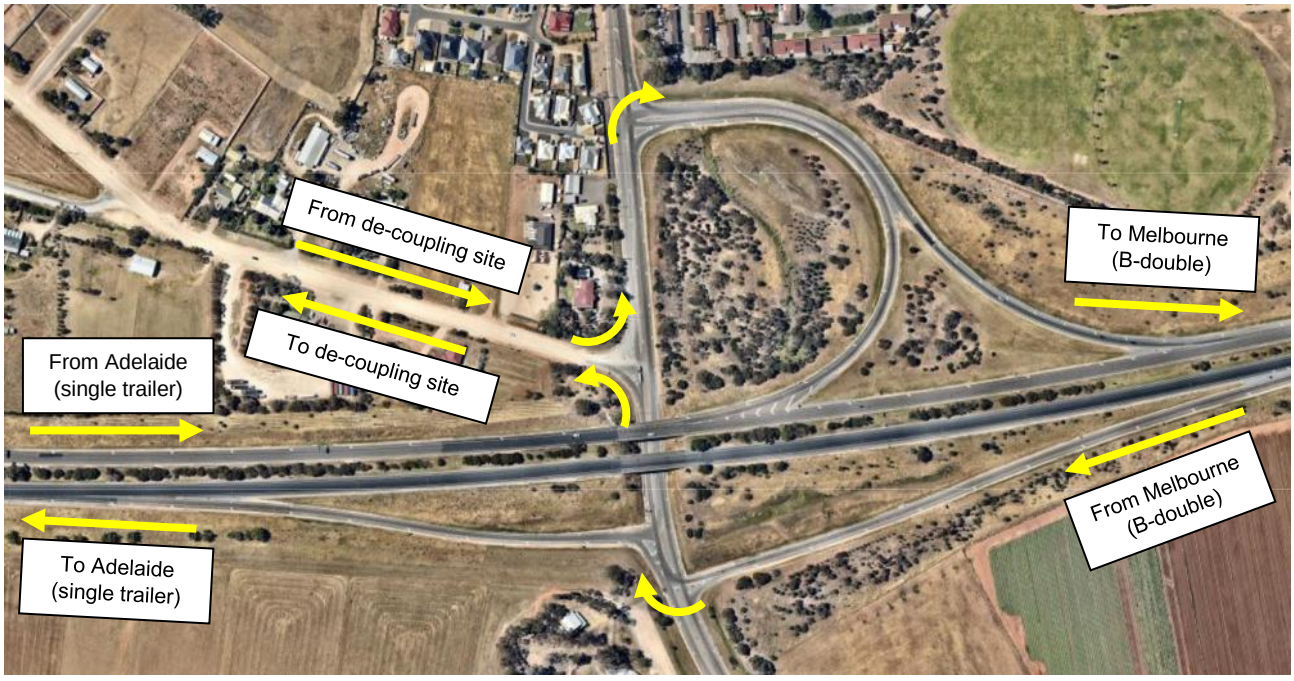


Source: http://rp.nhvr.net/ (accessed 14 June 2017)

Travel between Adelaide and the de-coupling site was not of any concern as the de-coupled single trailer combinations were General Access vehicles. For travel between Melbourne and the de-coupling site, the coupled B-double combinations were required to make four turns, as indicated in Figure 6.3:

- A right turn and a left turn when approaching the site from Melbourne
- A left turn and a right turn when leaving the site towards Melbourne.

Figure 6.3: Access between Princes Highway (M1) and de-coupling site (B-double turns indicated)



Source: http://www.nearmap.com.au/ (accessed 14 June 2017)

DPTI initially determined that the swept path width of the proposed 27-metre B-double combinations would be too great for safe access to and from the proposed de-coupling site.

The solution to the second problem

The swept path analysis initially conducted by DPTI was based on an Austroads swept path turning template representing the maximum swept path width for a PBS Level 3 combination. This template has a maximum width of 10.6 metres, which is 1.4 metres greater than the swept path width of the combinations actually proposed. Using the Level 3 swept path turning template to assess this particular Level 3 combination, which is closer to the Level 2 template, was highly conservative.

DPTI later re-assessed the swept path taking into account the specific dimensions of the proposed combinations, and the resultant swept path performance. The swept path performance was much closer to that of a 26-metre B-double than that indicated by the PBS Level 3 template, and it was found that access could be granted to the de-coupling site after all. At the time of writing, however, the proponent had yet to re-apply for the permit.

The lesson

Sometimes the swept path performance of a particular vehicle combination is much better than the Austroads turning templates describe as a worst-case for a vehicle of that class, in which case a swept path assessment taking into account the actual dimensions of the combination can make access possible where it might at first seem impossible.

6.2 Case study #2 – Swept path of Level 2B vehicle on B-double route

Introduction

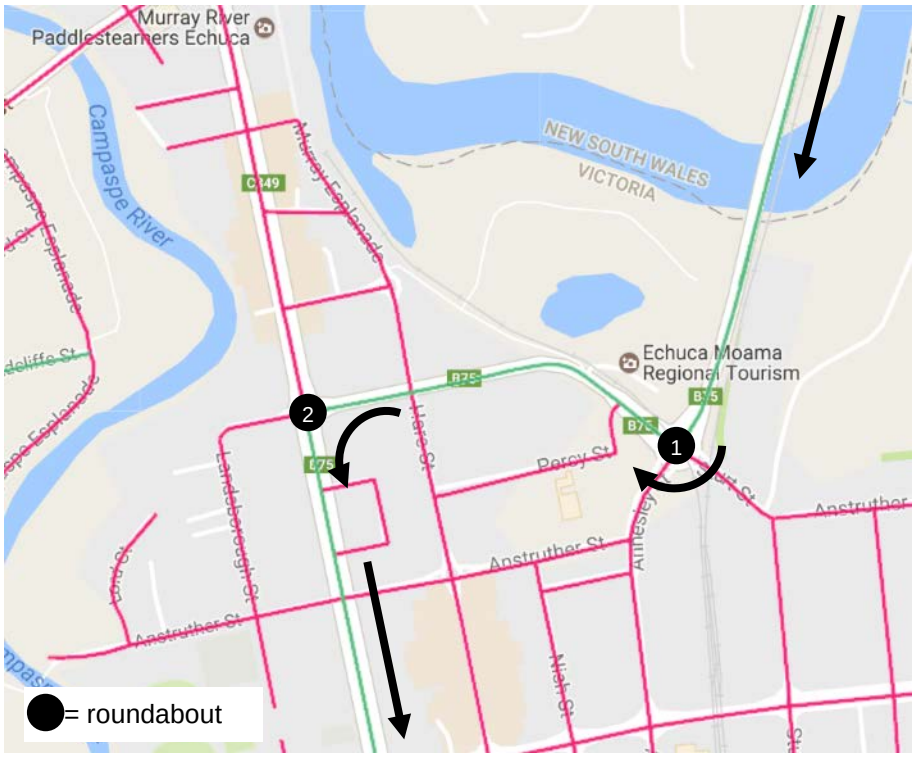
The proponent is a transport company that operates a PBS Level 2B quad-tri B-double combination with an overall length of 30 metres, similar to that shown in Figure 6.4.

Figure 6.4: Indicative example of a PBS Level 2B 30-metre B-double (quad-tri)

Source: http://farm8.static.flickr.com/7130/7056263979_46566998f2.jpg (accessed 13 June 2017)

The company sought access for the combination on a specific route between New South Wales and Victoria, crossing the Murray River at Echuca-Moama. The path normally taken through Echuca by 26-metre B-doubles is shown in green in Figure 6.5. This is the only route approved for 26-metre B-doubles to travel through town once the vehicle has crossed the Murray River. It therefore sees plenty of 26-metre B-double traffic. The route includes two roundabouts, labelled '1' and '2' in Figure 6.5.

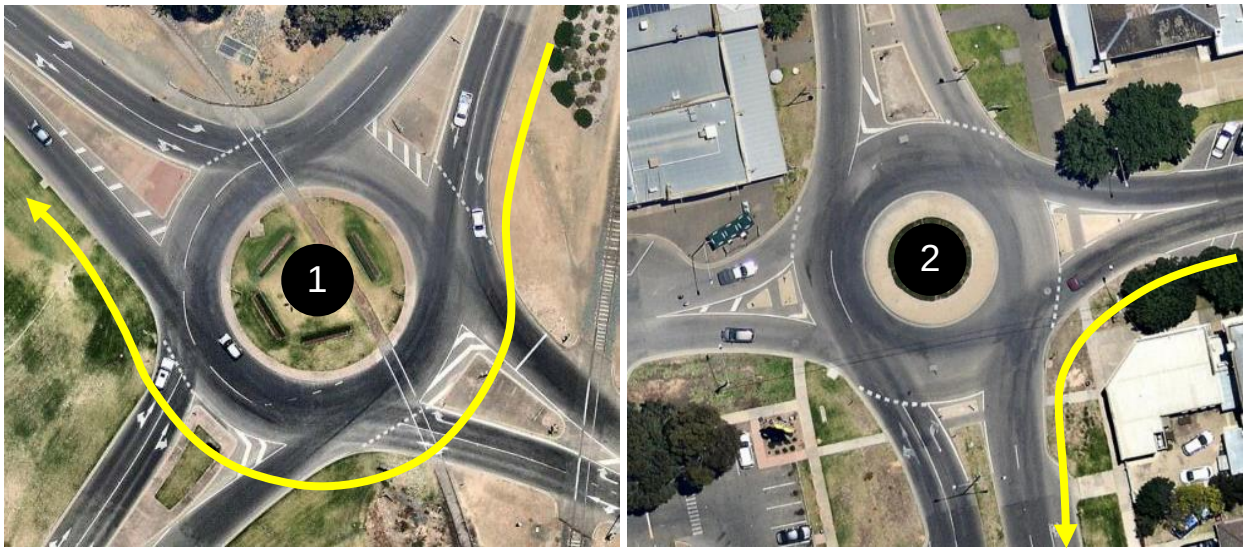
Figure 6.5: 26-metre B-double route through Echuca



Source: http://rp.nhvr.net/ (accessed 13 June 2017)

Figure 6.6 shows aerial photography of the two roundabouts. They appear to have generous proportions in keeping with a B-double route.

Figure 6.6: (L) Roundabout 1, (R) Roundabout 2



Source: http://www.nearmap.com.au/ (accessed 14 June 2017)

The problem

The road manager (in this case, VicRoads) supported access subject to the company producing a swept path assessment showing that the combination was capable of travelling through the two roundabouts.

The solution

The company engaged a consultant to assist with the swept path assessment. The consultant advised VicRoads that, being approved at Level 2, the combination has a swept path width that is acceptable on roads that are suitable for B-doubles. The access was granted without the swept path assessment being performed.

The lesson

If a vehicle has PBS Level 2 approval (either 2A or 2B), swept path width will not be a barrier to access on a route that is suitable for 26-metre B-doubles.

6.3 Case study #3 – Clearance time through unsignalised intersection

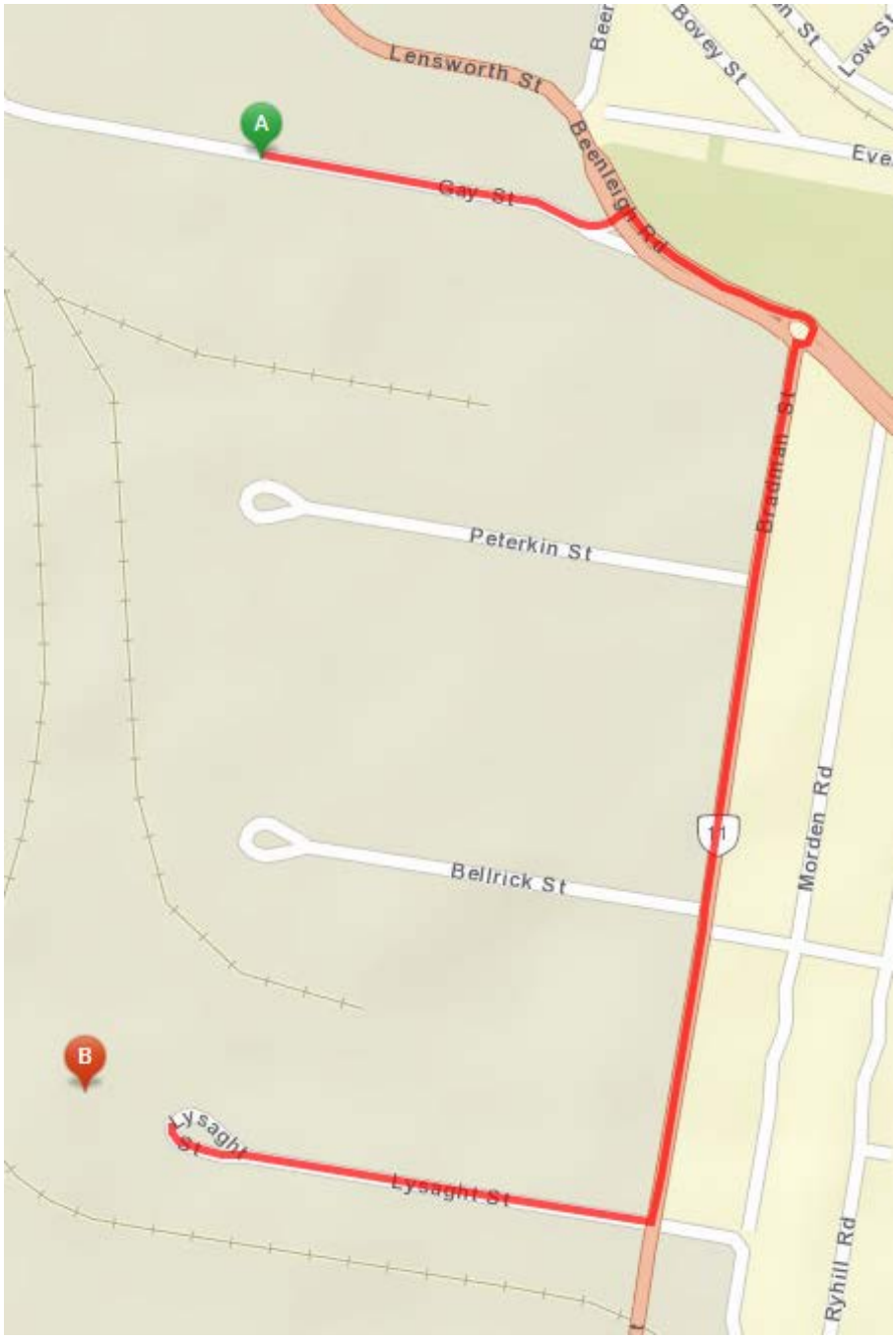
Introduction

Brisbane City Council received a request for a PBS 30-metre A-double flat-top combination to access a short route in Acacia Ridge that is approved for 26-metre B-doubles (NHVR Journey ID EZUS-8 Version 1, reproduced in Figure 6.7). The freight task was to transport heavy steel coils. The operator had been performing the task with two B-doubles, and sought to replace the two B-doubles with one A-double combination.

The problem

The southbound journey required the combination to negotiate a right-hand turn from Gay Street onto Beenleigh Road, which is a four-lane divided road. There was some concern within the council that the additional length of the combination may increase the intersection clearance time to an unacceptable level, given the speed of traffic on the through road and the fact that the intersection is unsignalised (Figure 6.8 and Figure 6.9).

Figure 6.7: The requested route (NHVR Journey ID EZUS-8 Version 1)



Source: NHVR Journey Planner, http://gis.nhvr.gov.au/journeyplanner/ (accessed 3 August 2017)

Figure 6.8: Right-hand turn across four lanes at the unsignalised intersection

Source: http://www.nearmap.com.au/ (accessed 3 August 2017)

Figure 6.9: Approximation of the truck driver's view before committing to the turn

Source: Google Maps, https://www.google.com.au/maps/ (accessed 3 August 2017)

The solution

The applicant and the NHVR approached Brisbane City Council with an offer to participate in a council-supervised demonstration run along the requested route using one of the applicant's existing 30-metre A-double combinations. The existing combination was a tanker, but it was considered to be a suitable substitute for the demonstration. The offer was made on the understanding that access would be granted if the demonstration was found to be satisfactory. The council accepted the offer, seeing it as the best way to establish the safety of the proposed operation. The council was hopeful of a positive outcome both for the benefit of the applicant and because it would reduce the number of restricted access vehicles using council roads.

The demonstration was organised to occur at an off-peak time so that traffic levels in the area would be low and risk would be reduced. Attendees included representatives of the applicant, the NHVR and Brisbane City Council.

The demonstration proved the ability of the combination to clear the intersection satisfactorily, and Brisbane City Council consented to the access.

The demonstration was an opportunity to witness the combination travelling along the entire route, which included a right-hand turn at a roundabout. Figure 6.10 illustrates the ease with which the combination could negotiate the roundabout; a 30-metre A-double has swept path performance better than that of a 26-metre B-double.

Figure 6.10: Demonstration of 30-metre A-double performing right-hand turn at roundabout

Source: Brisbane City Council

The lesson

Where on-road performance is a potential concern and the proposed combination is yet to be constructed, a demonstration run using an existing combination of similar design, attended by all relevant stakeholders including the road manager, is a good way for the road manager to establish their response to the access request. This may include conditions of access if necessary.

6.4 Case study #4 – Route compliance for a quad axle semi-trailer

Adapted from a case study previously published by Transport Certification Australia (2010)

Introduction

Established in 2006 as a joint venture between Linfox Logistics and brewer Lion Nathan, BevChain Logistics has moved quickly to become a leading supplier of transport and logistics services to alcoholic beverage companies. BevChain Logistics has a fleet of 150 trucks and a total of 600 employees, including 200 warehouse staff located throughout Australia.

One of BevChain Logistics' responsibilities is the transport and warehousing of beer from the Castlemaine Brewery in Milton in Brisbane's inner west to its warehouse 11 kilometres away in Hendra. The company sought approval from Brisbane City Council to run 50-tonne PBS quad axle semi-trailers with 27-tonne quad axle groups (Figure 6.11) as a high-efficiency shuttle service on a specific route connecting the two sites (Figure 6.12).

With this vehicle access the company would be able to undertake fewer journeys, resulting in reduced emission levels and fewer trucks on the road while undertaking the same transport task. Products would then be distributed from the warehouse to hotels and other licensed premises, principally in Queensland, using conventional vehicles.

The problem

A suitable route was agreed, but Brisbane City Council was unable to commit to the operation without a high degree of certainty that the vehicles would adhere to the approved route.

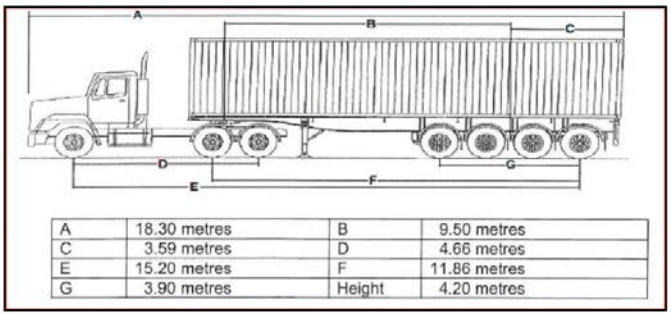
The solution

BevChain Logistics enrolled in the Intelligent Access Program (IAP), which provides evidentiary-level position-tracking, record-keeping and reporting to road managers of any non-compliance with the conditions of access. The company engaged a Certified IAP Service Provider to track the location of its vehicles in relation to the approved route at all times, which provided Brisbane City Council with the certainty it needed to grant access to the vehicles.

The lesson

If access can only be granted to certain parts of the network, concerns about route non-compliance can be managed if the operator enrols in the IAP. The National Telematics Framework, the platform on which the IAP is built, is also capable of managing compliance with maximum speed conditions (including low-speed bridge crossings), maximum mass conditions (both axle group and GCM) and even headway in the case of multiple heavy combinations travelling over sensitive structures.

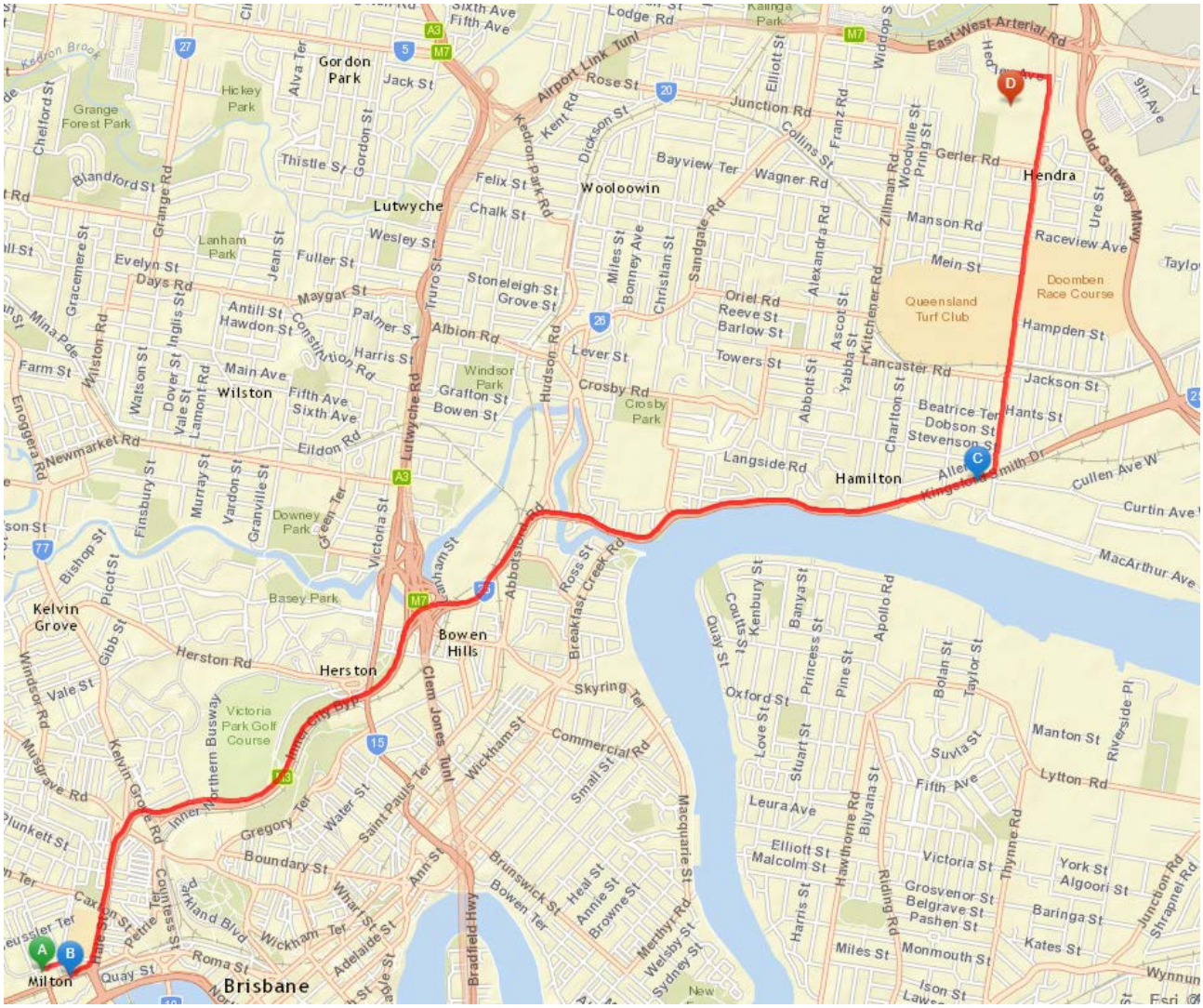
Figure 6.11: BevChain Logistics PBS quad axle semi-trailer



A	18.30 metres	B	9.50 metres
C	3.59 metres	D	4.66 metres
E	15.20 metres	F	11.86 metres
G	3.90 metres	Height	4.20 metres

Sources: Transport Certification Australia (2010), Queensland Department of Transport and Main Roads

Figure 6.12: Requested route



Source: NHVR Journey Planner, http://gis.nhvr.gov.au/journeyplanner/ (accessed 16 August 2017)

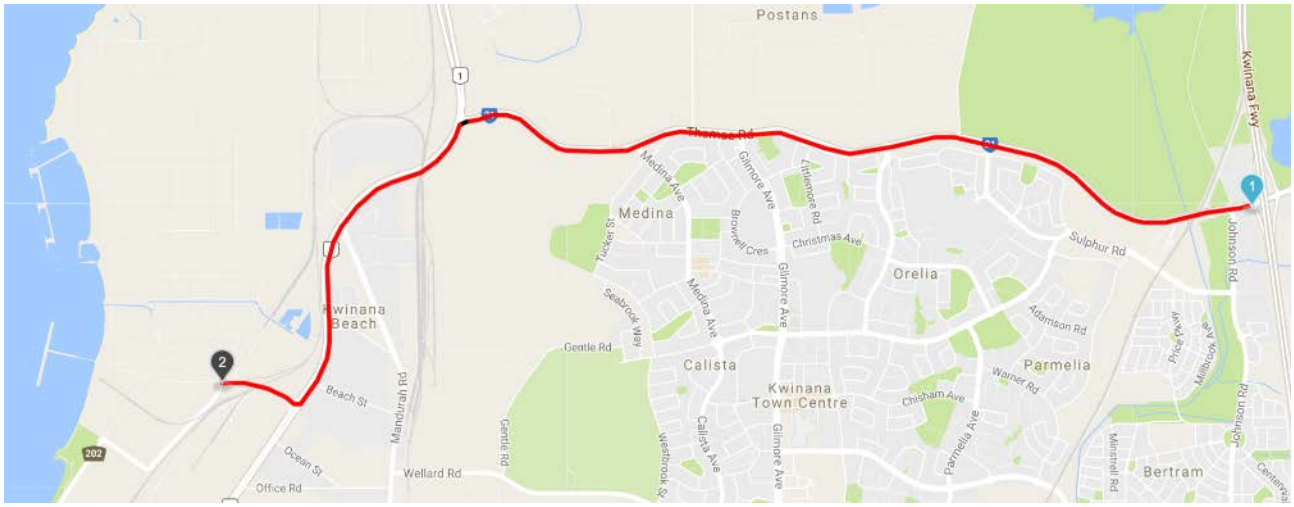
6.5 Case study #5 – Road user charging

Adapted from a case study previously published by Main Roads Western Australia (2016) and Transport Certification Australia (2017)

Introduction

This case study outlines the method by which Main Roads Western Australia (MRWA) tested the concept of charging a small number of transport companies for access to a particular area south of Perth. A trial was conducted for 36.5-metre road trains to access the Kwinana Industrial Area, including the local government-managed Kwinana Beach Road. The trial enabled direct access from Kwinana for the movement of fuel and dangerous goods without having to use Kewdale as a staging area for 27.5-metre road trains. The route selected for the trial started at the Kwinana Freeway and included Thomas Road, Rockingham Road and the first 460 metres of Kwinana Beach Road (Figure 6.13). The route was assessed as meeting the standards required for the trial vehicles.

Figure 6.13: Route selected for the Kwinana Industrial Area road train access trial



Source: http://rp.nhvr.net/ (accessed 16 June 2017)

The problem

As this was a proof-of-concept, there was no specific barrier to access *per se*. If proven to be viable, however, the concept could be used to overcome barriers that may arise in the future. An example is when a particular piece of infrastructure requires upgrading to allow access to one or more transport companies; it would be appropriate in such circumstances to charge those transport companies on a per-trip basis for the access as a way of recovering the cost of the upgrade.

The solution

MRWA worked with Transport Certification Australia to implement a road user charging solution using vehicle telematics to determine the charges to each company on the basis of a nominal fee per trip. The trial, which ran from 1 August 2016 to 31 May 2017, was limited to non-containerised freight transported by operators having access to a depot on Kwinana Beach Road. The nominal fee of $0.10 per trip would not have been sufficient to cover any road upgrades; in fact, the cost of administering the trial far exceeded the revenue collected. The trial did have some positive outcomes which will inform any future use of the method.

The lesson

The trial was successful in that it established the system could be used for specific small-scale projects, for example when a road manager upgrades a road and wants to recover the costs from certain transport operators who use that road. The system would not, however, be suitable for a wider road user charge, due to the significant back-office requirements. Further to this, to implement a wider road user charge, the system would need the ability to track trailers to determine the actual vehicle configuration so as not to be reliant on operator self-declaration.

6.6 Case study #6 – Route assessment for variable PBS combination

Introduction

Wynyard Transport is a milk cartage contractor based in Wynyard in north-west Tasmania. The company developed a unique PBS tanker for more productive milk transport. An essential feature of the design is that the gap between the truck and trailer can be adjusted via a telescopic dolly drawbar. When the drawbar is retracted the combination is suitable for General Access at 50.0 tonnes; when it is extended access is restricted to the B-double network for operation at the sum of axle group mass limits (67.5 tonnes). In some circumstances, subject to the PBS classfication and bridge load capacity of specific routes, high mass can be carried even with a retracted drawbar. The combination is shown in Figure 6.14 in both the retracted and extended configurations.

Figure 6.14: PBS combination with adjustable drawbar retracted (top) and extended (bottom)

Source: Wynyard Transport

The combination has four operational scenarios, which are described in Table 6.1.

Table 6.1: Operational scenarios of length-adjustable PBS combination

Access type		Drawbar	Overall length (m)	Maximum mass (t)	Bridge assessment
1	Level 1 network access (~ General Access)	Retracted	21.0*	50.0	Tier 1
2	Level 1 specific route access (by application)	Retracted	21.0	59.0	Tier 2/3
3	Level 2A network access (~ B-double network)	Extended	26.0	67.5	Tier 1
4	Level 2A specific route access (by application)	Retracted	21.0	67.5	Tier 2/3

** In Tasmania the length limit for General Access is 21 metres*
Source: Advantia Transport Consulting Pty Ltd

The intent of the various scenarios is:

Scenario 1: At 50.0 tonnes, the combination fits within the Tasmanian General Access length limit of 21 metres and satisfies the Level 1 Tier 1 bridge formulae in the PBS Bridge Loading Standard. The combination has unrestricted road access because it is within conventional mass and dimension limits.

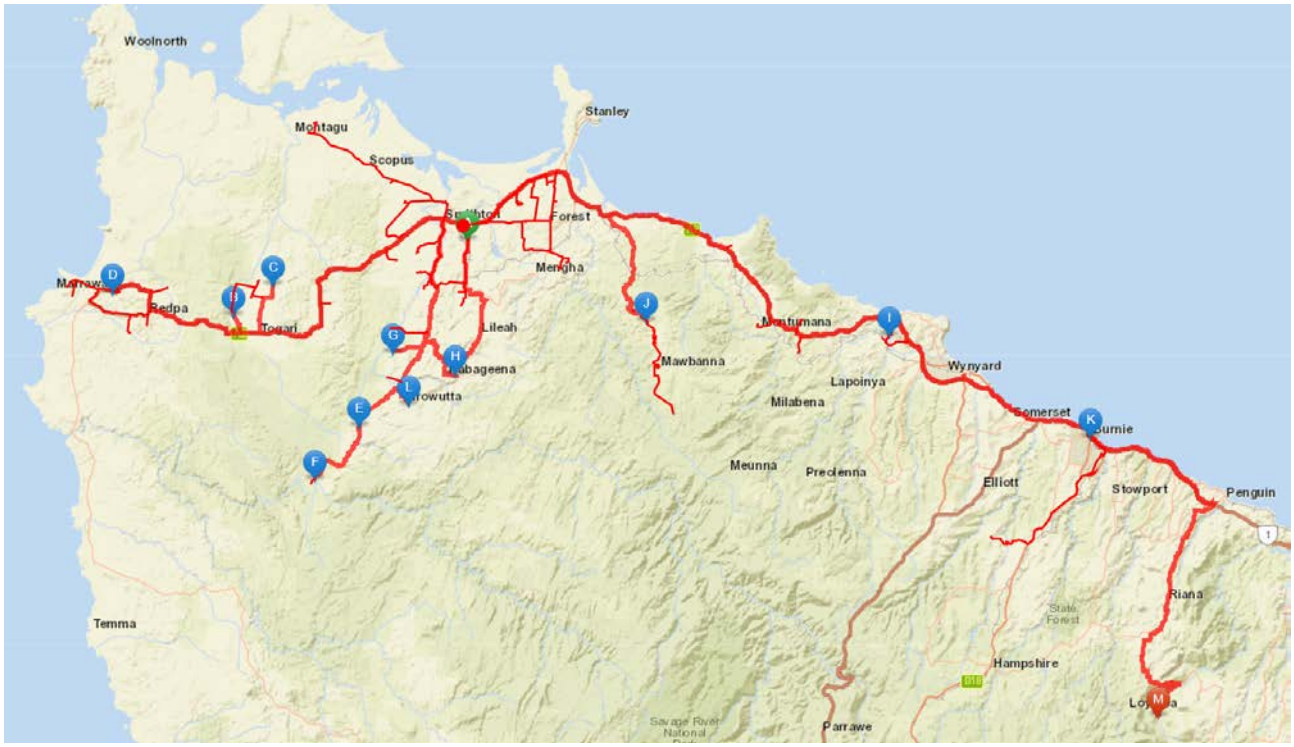
Scenario 2: At 59.0 tonnes, the combination continues to satisfy the PBS Level 1 safety standards but it no longer satisfies the Level 1 Tier 1 bridge formulae in the PBS Bridge Loading Standard. Therefore, subject only to a satisfactory Tier 2/3 bridge loading assessment by the road manager, the combination may be allowed to operate on certain Level 1 roads.

Scenario 3: The drawbar is extended so the combination is 26.0 metres long and satisfies the Level 2 Tier 1 bridge formulae in the PBS Bridge Loading Standard at 67.5 tonnes. It is now limited to the PBS Level 2A network and selected parts of the Tasmanian 26-metre B-double network which have been deemed suitable for this truck and dog combination.

Scenario 4: At times it will be desirable to access a road at 67.5 tonnes with the drawbar retracted. The combination satisfies PBS Level 2 safety standards in this configuration but it does not satisfy the Level 2 Tier 1 bridge formulae in the PBS Bridge Loading Standard. A Tier 2/3 bridge loading assessment must be performed to enable access in this scenario.

Wynyard Transport requested access to a number of sites in north-west Tasmania. Figure 6.15 shows the majority of the requested routes. The Tasmanian Department of State Growth and some municipalities were required to approve access where possible for each of the four operational scenarios.

Figure 6.15: Some of the routes requested in north-west Tasmania



Source: NHVR Journey Planner, http://gis.nhvr.gov.au/journeyplanner/ (accessed 9 August 2017)

The problem

Access decision-making needed to determine which of the four scenarios could be allowed on the various requested roads. This was not a straightforward process, particularly because of the complex bridge loading assessments that were required.

The solution

Similar approaches to road access determination were taken by the various road managers. Consultation for this report included the state road authority (the Department of State Growth) and two municipalities (Circular Head Council and Meander Valley Council).

The three factors considered by road managers were:

- impacts on bridges in the various operational scenarios
- how the combination matched road geometry with retracted and extended drawbar
- pavement loading effects.

Determining access for the combination at high mass in the retracted configuration—specifically, for scenarios 2 and 4, which do not satisfy the Tier 1 bridge formulae—required engineers to conduct Tier 2/3 bridge loading assessments. It was found that access could in fact be granted to many of the requested state-managed roads for scenario 4, which is the most imposing of all of the scenarios. Some state-managed roads, however, did require the combination to operate under scenario 3, which carries the same mass but with the drawbar extended to satisfy the Tier 1 bridge formulae. Where the combination needed to be extended in order to cross bridges, there needed to be suitable locations for it to pull over and extend. For this to be practical there needed to be sections of road where the combination can operate in both the retracted and extended configurations with a suitable stopping place in that section.

Municipal engineers were less likely to be able to grant access for scenario 4, but in many cases could determine whether the combination simply needed to be extended to scenario 3 or subjected to a reduction in mass in the retracted configuration. Circular Head Council used a spreadsheet-based bridge loading assessment tool called QuickBridge, which is freely available online. Meander Valley Council relied on state government-funded bridge assessments that were performed by several of the large civil engineering consultancies in various parts of the state. These assessments were based on Class 1 load-carrying vehicles ('OSOM' vehicles) which are much heavier than freight vehicles, so where a Class 1 load-carrying vehicle was able to cross a bridge at a particular mass the council was prepared to grant access to the PBS combination.

Given the 'milk run' nature of the proposed task, where the vehicle is gradually loaded as it stops at various dairies, the high-mass operation tended to be confined to state-managed roads in the latter parts of the journey. Municipal officers were therefore not so concerned about high mass on some of the requested roads.

The geometric fit of the combination, in terms of its swept path width and lane width requirements, was considered to be acceptable on the basis that the combination satisfied PBS Level 1 standards (equivalent to General Access) in the retracted configuration and PBS Level 2 standards (equivalent to B-double access) in the extended configuration. The section of the Bass Highway west of Smithton is not a high-standard B-double route in terms of its lane and shoulder widths. Access was granted in the Scenario 3 configuration to ensure safe passage at HML masses over a bridge with lower structural capacity, following a risk-based assessment of the performance of this particular PBS design against the performance of the 26-metre B-doubles which have as-of-right access. There have been no complaints from the public to-date.

The pavement loading effects of the combination were of no concern to road managers. In fact, the effects were considered to be preferable to those of other combinations featuring single axles and tandem axle groups, which have a higher road wear effect per unit of freight than triaxle groups.

The lesson

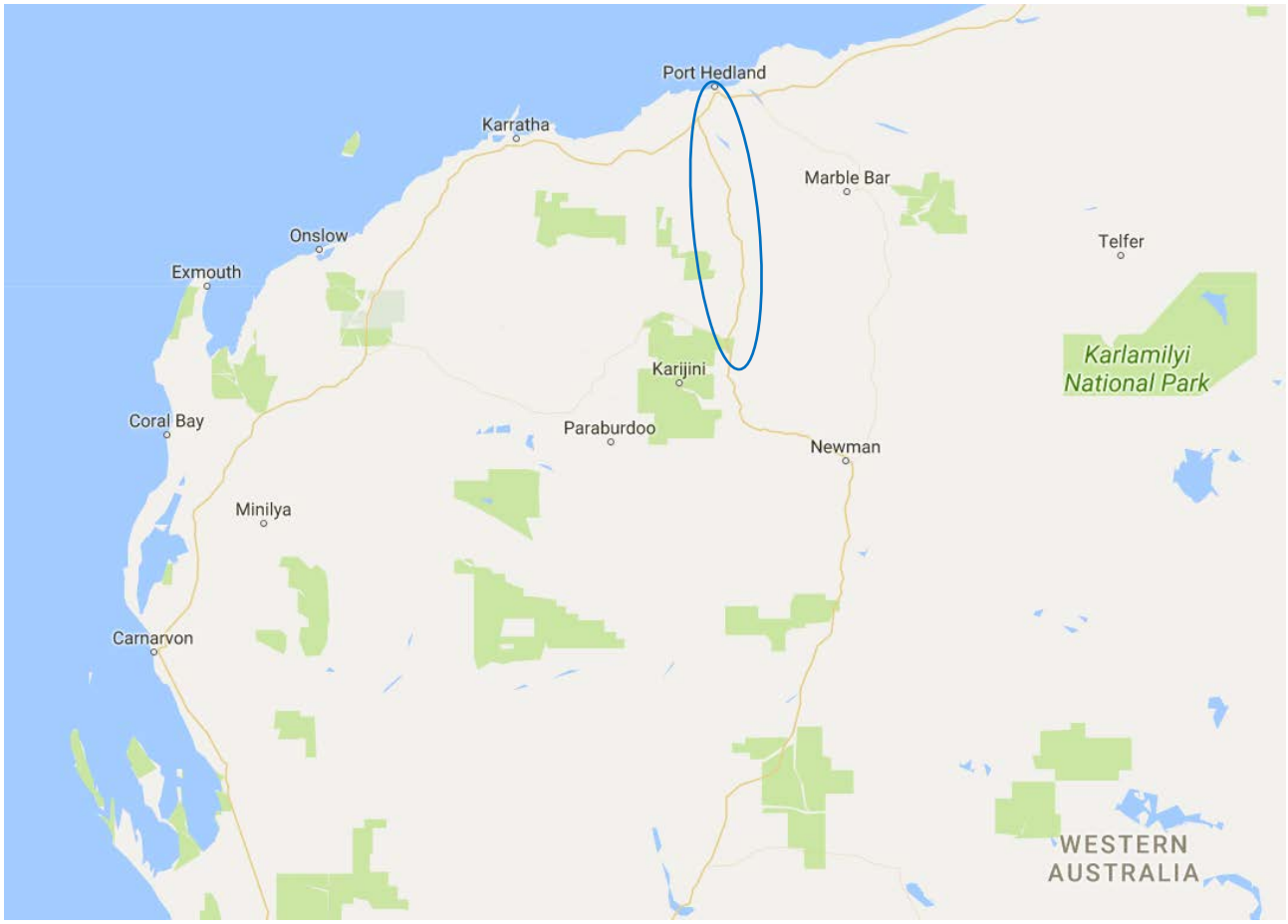
Where a proposed PBS combination is heavier than existing prescriptive vehicles, or carrying the same mass over a shorter distance, or both, it is possible to grant access if a bridge loading assessment proves that the combination either is no worse than existing vehicles (Tier 2 assessment) or does not exceed the load capacity of the structure (Tier 3 assessment). Various tools exist for such assessments to be conducted in-house, and in many cases Tier 2 assessments can be outsourced to consultants. PBS Assessors are capable of performing Tier 2 assessments. State road authorities may also be able to assist local councils with bridge loading assessments.

6.7 Case study #7 – Explaining the benefits in meaningful terms

Introduction

In October 2015 the Western Australian Transport Minister announced a trial of 60-metre "super quad" (A-quad) four-trailer road trains in the Pilbara region (Government of Western Australia 2015). The 3-month trial was conducted on a section of the Great Northern Highway between Munjina-Roy Hill Road and Utah Point, Port Hedland (Figure 6.16).

Figure 6.16: Trial location in the Pilbara region



Source: Google Maps, https://www.google.com.au/maps/ (accessed 15 August 2017)

Four-trailer road trains have been operating successfully in the region for many years in AAB-quad configuration within an overall length limit of 53.5 metres. They are well-accepted by road managers and are now considered to be standard equipment for large mining operations in the region. The AAB-quad configuration is a B-double trailer set coupled to the rear of a double road train via a converter dolly (Figure 6.17, top). The new 60-metre A-quad configuration replaces the B-double trailer set with an A-double trailer set (Figure 6.17, bottom). This puts a converter dolly between the last two trailers and therefore adds another axle group to the combination, increasing the gross combination mass.

The longer and heavier A-quad combinations are subject to higher safety standards and operating conditions than the existing AAB-quad combinations, so it was expected that they would be accepted by road managers and the public.

Figure 6.17: (TOP) Existing common 53.5-metre AAB-quad, (BOTTOM) 60-metre A-quad

Sources: Trailermag.com.au (2016), Government of Western Australia (2015)

The problem

In Western Australia the responsibilities for heavy vehicle regulation and road asset management are all managed by various sections within Main Roads Western Australia (MRWA). The Heavy Vehicle Services (HVS) section sets the policy for heavy vehicle mass and dimensions and issues permits in consultation with road asset managers in the various regions. At times HVS encounters resistance to longer and heavier high-productivity combinations from the regional road managers, which HVS believes stems from an insufficient understanding of the benefits of those combinations.

The kinds of responses HVS received from regional road managers about the 60-metre road train trial include the following, which have been paraphrased for clarity:

On-road performance: HVS has an ill-informed view of the supposed performance of these 60-metre road trains, believing that they perform better than existing 53.5-metre road trains, are better for the road and are safer. A recent trial of the operational manoeuvrability of the 60-metre road train showed that they were similar to, if not slightly worse than, a 53.5-metre road train at negotiating tight bends in the Coongan Gorge on Marble Bar Road. They did not 'perform better'.

Road wear: The 60-metre road train runs eight triaxle groups with 23.5-tonne loads, whereas the 53.5-metre road train runs seven triaxle groups with 23.5-tonne loads. Each loaded triaxle group creates a wear factor (ESA) of 2.84 and therefore a 60-metre road train has a pavement wear value of 22.7 ESA and a 53.5-metre road train has a wear factor of 19.9 ESA. Clearly, 22.7 ESA is greater than 19.9 ESA, so how are these new combinations 'better for the road'?

Although these are examples of internal communications within a state road authority about access for large multicombination vehicles on remote state-managed roads, the issues raised are comparable to those often raised when municipal road managers consider access for smaller PBS combinations in built-up areas. The way that HVS managed these perceptions could be adapted to other contexts.

The solution

HVS responds to regional road managers with facts and supporting information that convince the road managers that the proposed combinations are in fact an improvement on current operations. Responses to the above two issues are reproduced below.

On-road performance: The PBS Scheme was developed by the National Transport Commission (NTC) and is a scheme supported by all State and Territory road authorities. The scheme has since been taken over by the National Heavy Vehicle Regulator (NHVR) and has undergone assessment by Austroads quantifying the benefits of the higher productivity PBS vehicles. HVS has been convinced by these agencies and other road authorities that these PBS vehicles perform better than existing 53.5 metre road trains, are better for the road and are safer on the road.

One Austroads report found that if the overall freight task was completed by higher productivity PBS vehicles rather than conventional trucks, a reduction in heavy vehicle crashes of 66% would be expected. A crash rate reduction of between 57% and 85% was observed for all four of the examined severity ranks (minor, moderate, serious and major), resulting in an estimated saving of 96 lives by 2030, valued in the order of $156 million by 2030.

The reference to better performance is in relation to safety performance characteristics, such as rollover threshold, rearward amplification, high-speed transient off-tracking, load transfer ratio and tracking ability. One of the key findings during the evaluation process was the on-road performance of the vehicles matched or exceeded the expectations based on the initial PBS assessments. This is reflected in the 60 metre Road Train Evaluation Report and was reflected in related media releases. There was no mention of the low speed swept path of PBS road trains being better than conventional road trains. However, the PBS vehicles fit into the swept path assessment envelope, i.e. are suitable for the same level of access as a conventional road train. With regard to the Coongan Gorge, the road itself doesn't meet the standards for the approved level of access, i.e. it is not the vehicle that doesn't meet the standards.

The improved safety with PBS vehicles comes from knowing how each particular vehicle combination is going to behave on the road. Each individual vehicle design is assessed and certified, as opposed to conventional road trains that can consist of any licensed vehicle coupled together. Furthermore, checks are conducted on PBS vehicles to ensure the most appropriate towing vehicles are used and appropriate components are used, such as appropriately rated tow couplings and specific category tyres. Braking capability is also improved on PBS vehicles with the mandatory requirement for Electronic Braking Systems (EBS) with Rollover Stability Systems (RSS) in WA, which is not a requirement on conventional road trains.

Road wear: With regard to road wear (ESA), when considering the impact of different combination types on the pavement, a simple ESA calculation for each combination is not considered appropriate. Obviously the more axles a vehicle combination has, the greater the ESA. However, more axles in a combination do not necessary result in greater pavement wear overall because the higher ESA combination carries more freight and consequently imposes less road wear per unit of freight carried. HVS and other agencies use 'Payload/ESA' to determine the impact of higher productivity vehicles on the pavement. Payload/ESA of a 60 metre road train is more (i.e. better) than that of a conventional 53.5 metre road train. Therefore, the 60 metre road trains cause less pavement wear than the conventional 53.5 metre road train for the same transport task. Furthermore, the reduced number of journeys resulting from the higher productivity PBS vehicles also reduces emissions, congestion and risk exposure.

There are some who believe the vehicle numbers are unlikely to reduce, rather the transport operators will keep the same number of vehicles and simply increase their production, which will increase road wear. However, consideration needs to be given to the fact the particular transport task could end earlier if production increases. For example, a mine's life will come to an early end if all the resources are extracted and transported more efficiently. Therefore, if the PBS vehicles offer 15% more productivity and the vehicle numbers don't reduce accordingly by 15%, in the long term the life of the mining operation will be reduced by 15%. So it could be argued the higher productivity PBS vehicles result in reduced journeys, whether it is immediate or long term.

MRWA has published a statement of the benefits of PBS vehicles (Appendix B), which is an example of how local road managers can be supported in making their road access decisions.

The lesson

With the PBS Scheme now ten years old there is a growing body of published evidence that PBS combinations provide improved road safety outcomes. Also demonstrated perfectly in this case study is the fact that road wear will reduce either immediately if the number of vehicles is reduced or in the long term if the number of vehicles remains the same and the life of the task is shortened. In any case, PBS combinations are *more efficient* than their prescriptive counterparts, and therefore result in better economic outcomes for all concerned. Not only will their operators benefit, but also the businesses that rely on them for freight transport, and the communities who rely on those businesses.

7. Recommendations

Upon examining the barriers presented in Section 5 and the case studies presented in Section 6, recommendations were developed to address the spectrum of issues that present challenges to road managers in the approval of PBS access. It should be noted that some jurisdictions are more advanced than others in adapting to the PBS Scheme and may therefore be better equipped to deal with the various issues. As a consequence, the recommendations are not intended to be equally applicable to all jurisdictions. Each jurisdiction should consider its own situation before adopting the recommendations as presented. Those jurisdictions requiring a greater level of direction and support may find more value in the recommendations than others.

7.1 Recommendation #1 – Facilitate better knowledge and understanding of the PBS Scheme by road managers

Develop and deliver nationally co-ordinated education campaigns and supporting tools targeting local road managers and regional state road managers.

What stakeholder consultation revealed

A lack of high-quality education about high-productivity freight vehicles and the PBS Scheme is the greatest barrier to road access identified during stakeholder consultation, as evidenced by the contents of Sections 5 and 6 of this report. Ongoing education and the provision of easily accessible information for interested parties to make informed decisions is therefore considered to be this report's most important recommendation.

In Sections 5.1 and 5.9 we learned about the tendency for road managers to sometimes incorrectly assume that granting road access to a new PBS combination is going to increase existing truck traffic and impact negatively on amenity, when in fact existing vehicles will be replaced with safer and more efficient vehicles, thereby reducing truck traffic for a given freight task and improving amenity. Overcoming this one barrier alone would solve a significant portion of PBS road access problems.

In Section 5.2 we learned about various topics that are misunderstood by those who are not conversant with the details of the PBS Scheme, such as the benefits it delivers to safety and amenity, the improved swept path performance of modern longer combinations, the fit between existing networks and PBS network classifications, and the fact that axle group loads are not higher than existing regulations.

In Section 5.3 we learned about the fear of unintended consequences and personal liability that some road managers have, which may be mitigated through education.

In Section 6 we learned about real-life scenarios in which successful PBS road access decisions relied upon road managers being educated on-the-job. This is a sub-optimal situation; it would be much better if these decisions were made based on the sound knowledge of the road manager.

Why it is important

Education in this context has thus far been delivered in an unorganised manner, including things such as:

- basic high-level content on the NHVR website and state road authority websites
- NHVR presentations at conferences
- NHVR vehicle demonstration days

- NHVR, state road authorities, PBS Assessors and PBS Certifiers responding to inbound enquiries from transport companies and trailer builders
- PBS training courses.

Funding of tools and education should be able to be justified by evaluation against the road safety and broad productivity benefits that are aimed to be achieved through the successful introduction of PBS vehicles to the national fleet.

Options

Consideration should be given to making the education campaigns and tools:

- **properly-funded** because funding has been at bare-minimum levels thus far, and the required magnitude of improvement will not be possible without a significant increase in dedicated resources
- **nationally co-ordinated** because the message needs to be consistent and because this will streamline the development, delivery and associated costs nationwide
- **multi-channel** because different stakeholders learn in different ways, and one or two channels will miss large parts of the audience
- **ongoing** because staff turnover within local councils was identified as having a crippling effect due to the consequent loss of corporate knowledge, and future entrants to the PBS space will have a need for current knowledge transfer
- **of a high quality** because some stakeholders who claimed to have a working knowledge of the PBS Scheme were lacking important knowledge, and from the author's own consulting experience it is common for people to get false impressions of how the PBS Scheme operates when drawing from various sources.

Channels through which education may be delivered include:

- **an interactive website**, hosted by the NHVR, that is designed and implemented by online education professionals on the advice of trusted PBS professionals
- **a series of online video clips** of 2-3 minutes' duration, professionally produced on the advice of trusted PBS professionals, each covering one or more important points in a concise but engaging and effective manner, promoted on the interactive website and the NHVR's social media
- **a vehicle demonstration roadshow** similar to the demonstrations already conducted by the NHVR, showcasing the swept path performance of Level 2B combinations compared with conventional B-doubles, pointing out the various safety features of the vehicles, supported by influential speakers such as the Chair of the PBS Review Panel and senior executives from the relevant state road authority, with a calendar published on the NHVR website and promoted via the NHVR's social media
- **PBS training workshops** where interested parties come to learn about the PBS Scheme in a lecture-style environment with open Q&A component, with a calendar published on the NHVR website and promoted via the NHVR's social media
- **annual direct mail** to each local council and each state road authority, both electronic and print, with an update on PBS and advice on each of the above channels
- **Road manager** training in using the new NHVR Portal – Road Manager Module.

Closing remarks

Accessible tools coupled with education have the potential to break down the most barriers to local road access for high-productivity freight vehicles. Accessible education appears to be lacking at present, as evident from the stakeholder consultations and case studies. It may be possible to create an education campaign relying on only some of the above channels, but it is recommended that all channels be implemented to achieve a satisfactory outcome.

7.2 Recommendation #2 – Outsource road asset audit & assessment

Provide a mechanism by which local councils can apply for funding to outsource bridge asset auditing and geometric or structural route assessments to third-party professionals.

What stakeholder consultation revealed

Local councils are facing a rapidly increasing number of PBS road access decisions, partly because of the Heavy Vehicle National Law's requirement for individual road manager consent, and partly because of the increase in PBS road access applications in recent years. Further, consultation revealed that local councils often do not have sufficient knowledge of their infrastructure assets to conduct the route assessments necessary to facilitate optimal PBS road access, let alone the resource capacity to conduct them.

In Section 5.4 we learned about the difficulties that local councils are having when considering PBS Level 2 access on existing B-double routes; in some cases, roads are not up to PBS Level 2 geometric standards despite being gazetted for B-doubles. We learned about some road managers' lack of existing data on the capacity of their own infrastructure, and how to decide whether increased loads can be accommodated.

In Section 5.5.1 we learned about the increasing workload on local council road managers, where the workload in one case increased by a factor of 300 until mitigating measures were adopted.

In Section 5.8.3 we learned about the shortage of human resources in many municipalities, particularly those in remote areas, where PBS road access decisions may be undertaken by one person with only a fraction of time budgeted for this task.

Why it is important

Without having road networks assessed in advance it becomes necessary for each road access application to be assessed as it comes in. This is highly inefficient; it places a significant burden on the road manager and unduly draws out the access approval timeframe. It is a significant task to conduct an upfront geometric assessment of an entire road network, even if it is just for the local roads in a single municipality. Further, when considering bridge and culvert assets, it is necessary to first know where the assets are, what standard they were constructed to, what condition they are in, and how they respond to different classes of heavy vehicle. With appropriate funding, consulting engineers could be brought in to carry out the necessary work.

The primary responsibility of local councils is the management of their own assets; facilitating the freight task is a small but integral part of a local council's responsibilities. Local councils are excluded from directly receiving revenues from heavy vehicle charges. This compromises their ability to prioritise heavy vehicle expenditure.

Strategic regional freight investment on local roads would benefit from additional resources from major beneficiaries, including federal and state governments, industries and communities that benefit from increased productivity. Funding specifically targeting improved access for PBS heavy vehicles should be considered.

Options

This recommendation relies on the establishment of a funding source from which funding can be provided to road managers who successfully apply. A five-step process is suggested; other methods may be considered more suitable in some jurisdictions.

In the suggested five-step process, the first two steps are carried out by municipal officers and, subject to funding approval, the remaining steps are carried out by consulting engineers who are compensated by the funding. Preference should be given to professionals who can demonstrate a knowledge of the road assets in the region in question. Upon implementation of this recommendation a co-contribution from the municipality should be considered to increase the authenticity of applications.

- **Identify the roads** that may require high productivity freight vehicle access, including all roads in industrial estates, around commercial developments and to other freight generators such as farm gates and silos, and compile arguments to support the inclusion of each road
- **Apply for funding** to a central administrator to have each road assessed, building a case for each one (funding to be prioritised by the central administrator)
- **Assess the geometry** of the identified roads to determine each road's PBS classification from a geometric perspective
- **Build a structures database** including at least those structures on the geometrically assessed network, and preferably all structures managed by the municipality in case more roads are geometrically assessed at a later date
- **Assess the structures** to determine their capacity in terms of shear force, bending moment and pier/abutment reactions so that PBS combinations can be assessed at a later date.

Closing remarks

Funding to outsource road asset audits and assessments may alleviate much of the burden on a participating municipality. It may assist with ensuring that the assessment process is conducted in a timely and efficient manner, setting the municipality up for more streamlined PBS access in the future.

This process would benefit from a framework that ensures consistency of assessments and assessment costs across municipalities, so that there is a fair and equitable result. In considering equity, however, one must note that many rural and regional councils do not have the means to collect the same revenues as their urban counterparts. Consequently they are much more reliant on external funding sources, and may be eligible for higher priority.

7.3 Recommendation #3 – Funding for structural upgrades/replacements

Targeted funding to upgrade or replace critical structures so that high-productivity freight vehicles—such as 50.5-tonne PBS quad axle semi-trailers and 85.5-tonne PBS A-doubles—can access priority freight routes.

What stakeholder consultation revealed

The emergence of high-mass PBS combinations has highlighted the constraints of bridge assets on many parts of the network. Until the 21st century, bridges were not designed to accommodate these combinations. Generally speaking, the T44 design standard that was used from the mid 1970s until around the turn of the century was largely sufficient for B-double access but not for many of the newer high-mass PBS combinations without strengthening works. The MS18 design standard that was used prior to T44 is so insufficient for the newer high-mass PBS combinations that in most cases it requires complete bridge replacement.

The Federal Government's Bridges Renewal Programme provides funding for up to 50 per cent of the cost of bridge upgrades and replacements, to a maximum of $5 million per project, through a competitive merit-based selection process. In the three rounds completed since it started in 2014-15, the Bridges Renewal Programme has contributed more than $370 million towards more than 400 projects. (Minister for Infrastructure and Transport, 2017a, 2017b).

Infrastructure is gradually being brought up to the necessary standards under the available funding, but the rate at which it is occurring is not sufficient to allow large-scale improvements in access for high-productivity freight vehicles on local roads in the short term.

Why it is important

Until the PBS Scheme opened the doors to longer and heavier combinations, road freight was more likely to be volume-limited than mass-limited; more of the freight task was for bulky freight that filled the available volume inside a heavy vehicle before the vehicle reached its maximum legal axle group loads.

The argument for bridge upgrades and replacements has increased in importance now that PBS allows volume to be increased by much more than it allows gross mass to increase. For example, a 30-metre, 85.5-tonne A-double has about 25 per cent more gross mass capacity than a conventional 26-metre, 68.5-tonne B-double, but can have about 33 per cent more volume. This means that for an A-double it is more likely than for a B-double that a given freight consignment will reach the gross mass capacity of the combination before the combination's volumetric capacity is completely filled. Further, the additional 17 tonnes of gross mass may be well above what some bridges are designed to support on a regular basis.

We have witnessed the significant progress made in Victoria, where priority networks for high-mass PBS combinations have been identified and subjected to mass limitations on specific structures. Over time, the critical structures are being upgraded or replaced to bring them up to a standard that can accommodate the heaviest PBS combinations currently operating in Victoria. The Bridges Renewal Program has provided some of the funding for these upgrades. This has been an excellent example of what can happen when bridge upgrades and replacements are proactively funded.

Options

Recommendation #3 will be most effective if it is adopted in combination with Recommendation #2. This will provide a reliable estimate of the level of funding required to completely upgrade the network.

Closing remarks

A large component of a bridge's strength is there only to support its dead load, so it does not take a great deal of additional strength to enable a much higher live load. Investment in bridge infrastructure therefore appears on face value to be good value for money and something that should be considered as a priority.

7.4 Recommendation #4 – Improve the governance of, and confidence in, in-principle access decision-making

Consider legislative amendments to introduce binding decisions within a statutory timeframe when requests are made for access prior to a PBS Vehicle Approval being issued.

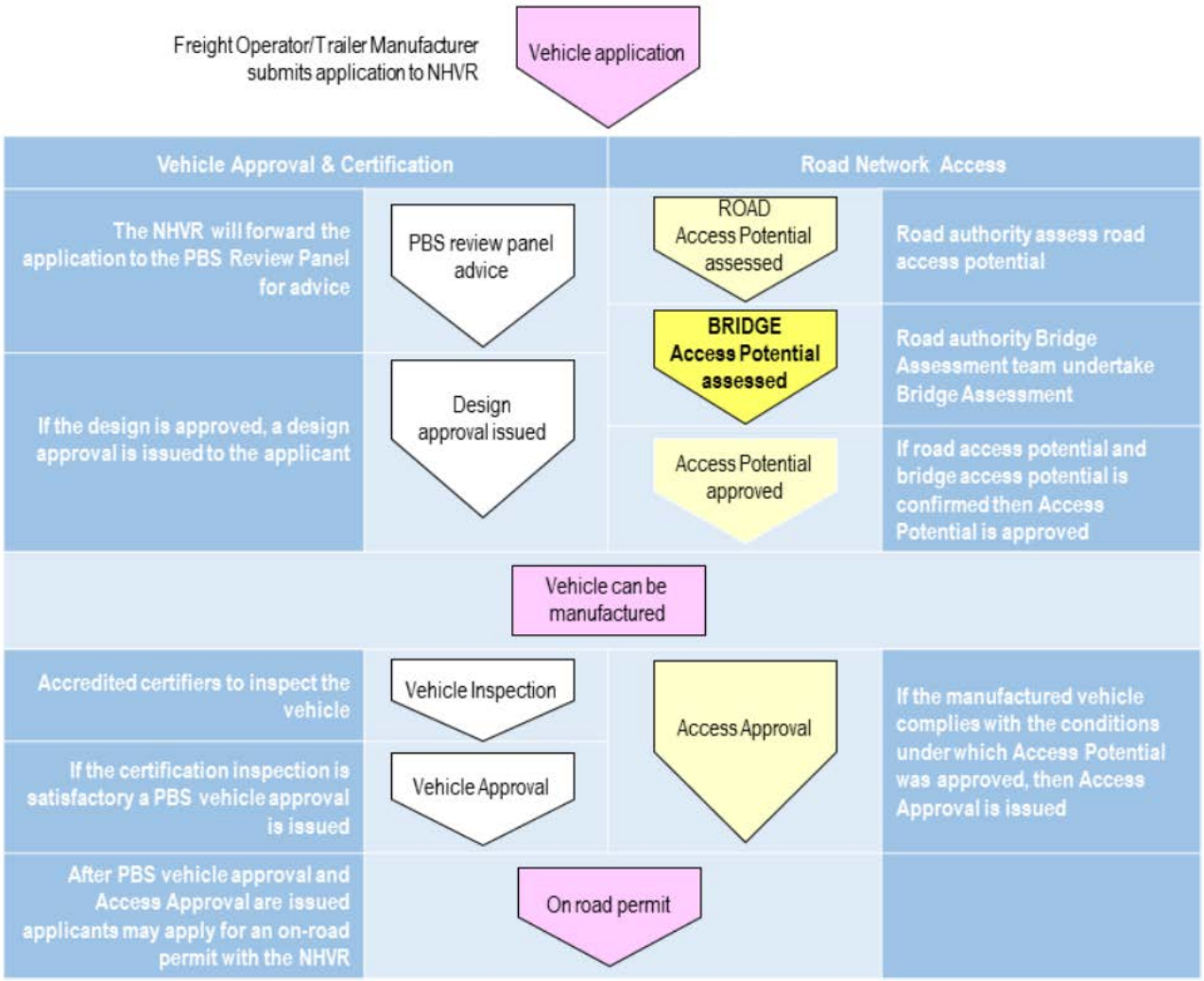
What stakeholder consultation revealed

It is becoming increasingly important for transport companies to obtain assurance that road access will be granted at the end of their PBS Approval process.

In Section 5.5.2 we learned that In-Principle Access Support (IPAS) is not recognised under the HVNL. A road manager is not legally bound to respond to a request for IPAS. If they do, they are not legally bound by the statutory timeframes that apply to a permit application, there is no appeal process in the event of a refusal, and a certificate of IPAS, if obtained, is not legally binding. The only way to obtain a legally binding access decision is to apply for a permit, which requires a PBS Vehicle Approval, which in turn requires the vehicle to be built before the access is determined.

Austroads (2016) addressed this issue and recommended that road access potential and bridge access potential be assessed and approved before a vehicle is built (Figure 7.1). Under this scenario a PBS Vehicle Approval cannot be issued without access approval having first been determined. The flowchart indicates that the road/bridge assessment process occurs in parallel with the Design Approval process. This report recommends that the two processes are conducted in series—the Design Approval being conducted first—as described later.

Figure 7.1: Bringing forward the bridge assessment process (Austroads 2016)



Note: Informal discussion between the applicant and the Road Manager to refine the application may occur prior to formally commencing the process above, however these are not binding on any party.

Why it is important

As PBS combinations become longer and/or heavier—and as more of those longer and/or heavier combinations gain access to certain parts of the road network—a positive feedback loop increases the demand for those combinations on those parts of the network, but also on other parts of the road network which may not be suitable for them. For example, a transport operator may notice a 30-metre A-double operating on a particular road in their municipality, and may wish to operate a similar combination on another road in the same municipality which may not be up to the same standard as the already-approved road. Over time, the likelihood of access being refused will increase.

The administrative 'In-Principle Access Support' (IPAS) process is constrained when dealing with this situation, and it is currently one of the biggest sources of resistance for the proliferation of PBS combinations. The alternative is to proceed with vehicle construction and formal permit application without going through the IPAS process, but this involves a significant financial risk unless it is obvious that the desired access will be approved due to significant precedent.

Without greater certainty of access prior to the approval and manufacture of a PBS vehicle, the PBS Scheme will always struggle to expand into new vehicle configurations and new access routes where there is currently no precedence on which to base investment decisions.

Options

Given that the vast majority of the cost to transport companies entering the PBS Scheme is the investment in new vehicle equipment, consideration could be given to a governance framework and potentially a legislative mechanism to allow access approval to be determined prior to that investment being made. Therefore the two options are to allow access requests to be lodged either:

- **before PBS Design Approval**, meaning that
  - the transport company will enjoy a small additional saving of time and money by not having to first obtain the PBS Design Approval, but
  - mass and dimension specifications will be at the draft 'sales drawing' stage; changes that might occur during the detailed design process may invalidate any IPAS outcome at the applicant's own risk
  - things normally identified by the PBS Assessor during the PBS Assessment process, such as payload management requirements, steerable axle auto-locking requirements, the PBS Level achieved and the actual performance values of the combination, will not yet be determined, and
  - there will be a relatively large number of speculative applications due to an almost non-existent barrier to entry
- **after PBS Design Approval**, meaning that
  - the transport company will make a small additional investment of time and money by first obtaining the PBS Design Approval, but
  - the approved mass and dimensions, associated operating conditions, and vehicle performance will be known
  - the most speculative applications will be filtered out by an increased barrier to entry.

In both cases the process will differ from the legislated permit application process because the transport company will not be applying for a permit; rather, the transport company will be applying for a legally-binding certificate of approval of the requested access, subject to the applicant continuing to obtain a PBS Design Approval, if applicable, and a PBS Vehicle Approval.

The preferred option is to require applicants to make an access application *after* obtaining a PBS Design Approval, for the reasons outlined above. Then, as outlined in Figure 7.1, the road access and bridge access approval should be determined.

The statutory timeframe for decisions should be the same as those for permit applications.

Closing remarks

The ultimate goal of the PBS Scheme is to provide automatic access approval to a published network once a PBS Vehicle Approval has been granted. We appear to be many years away from that situation, but a considerable step towards it can be achieved if Recommendation #4 is adopted and properly implemented.

7.5 Recommendation #5 – Incentivise on-time access approval

Amend the legislation or provide other forms of support so as to better enable access approval within an acceptable timeframe.

What stakeholder consultation revealed

From the author's considerable experience in managing in-principle access support applications over the past two years, and in communicating with various PBS fleet operators, PBS road access applications frequently require more than 28 days (end-to-end) to be resolved.

In Section 5.5.3 we learned that the Airports Act 1996 gives an example of how faster access approval could be incentivised. The Act puts the applicant ("an airport-lessee company") in a strong position by requiring the decision-maker ("the Minister") to work within a strict deadline to prevent an automatic decision in the affirmative being made on their behalf by default. Road managers have, however, argued against a similar approach being taken for road access approval. Their reasoning is that there are significantly greater risks involved with heavy vehicle access and also a likelihood that such a tightening of the legislation could have unintended consequences, such as access being refused immediately because there is insufficient time to conduct a proper evaluation.

Why it is important

The success of the PBS Scheme is reliant on broad access for PBS vehicles as compared to prescriptive combinations. Improving the efficiency of access decision-making as well as the extent of the approved network is likely to improve the proportion of the heavy vehicle fleet participating in the PBS Scheme.

A mature and developed PBS Scheme must have fast and reliable access decision-making.

Options

Incentivising action is, in this context, not straightforward due to the risks involved. Methods that work in other contexts may not be appropriate in this context.

Financial sanctions for responses out-of-time could be considered. To be effective, the impacts of any sanctions need to be sufficient to bring about a change in behaviour; the pain caused by the sanctions must exceed the pain caused by responding on time.

Another method is to set the default access decision to "approved" at the end of the statutory timeframe unless a road manager provides a valid reason to refuse access to one or more roads within that timeframe. A road manager may request an extension of time for complex decisions. The Airports Act example discussed in Section 5.5.3 demonstrates a strong precedent for this approach. Issues to consider, which were raised by stakeholders in Section 5.5.3, include:

- the time that some municipalities may need for council officers to secure approvals from councillors, depending on the levels of authority established within each municipality, and noting that the law allows road managers to request an extension of time if necessary
- the risks associated with unintended approvals, noting that (a) it is entirely within the power of every road manager to refuse access where necessary, but (b) bureaucratic errors could allow approvals to pass unchallenged
- the limited resources available within many municipalities.

Similar issues exist in the state/territory road authorities. Therefore at both levels of road management (state/territory and local) there are fundamental problems with legislating for rapid responses to matters that may require careful consideration to ensure public safety, amenity and infrastructure integrity.

Upon consideration and discussion with various stakeholders it was established that incentivising on-time access approval with a punitive approach is not ideal and could result in perverse outcomes, such as punishing road managers for a lack of resources—something that could be out of their control.

A more broadly supported approach is to provide assistance to road managers so that they can properly address road access requests. This is meant more for local road managers, particularly rural ones, who are less likely to be able to meet legislated timeframes due to resourcing issues, not only because they lack staff numbers but because they have few options available for raising funds to increase staffing to the required levels.

The NHVR has in the past published key performance indicators such as average permit turnaround times by road manager. Making public the performance of individual road managers may have an incentivising effect on its own.

Closing remarks

In the absence of a clear preferred direction from stakeholders, in particular the Project Reference Group, the recommendation is that more consideration should be given to how this particular issue might be resolved. The level of input required to properly resolve this issue is beyond the scope of the present project.

7.6 Recommendation #6 – Strengthen Section 156(3) of the HVNL

Strengthen Section 156(3) of the HVNL by:

- **redrafting it to require that any reasons given for access refusal are compelling**
- **enforcing compliance with Section 156(3)(b) so that where the requested access is refused for compelling reasons, access is nevertheless approved (if possible) with acceptable risk-mitigating conditions, e.g. reduced axle loads**
- **clarifying Section 4.4 of the NHVR's *Approved Guidelines for Granting Access*, which are referenced in Section 156(3)(a)(ii) of the HVNL as "approved guidelines".**

What stakeholder consultation revealed

The treatment of access requests under Section 156(3) of the HVNL differs between road managers and has been found to result in some access refusals that lack detail. For example, in numerous cases familiar to the author, access has been refused on the grounds of "significant risks to public safety" without pointing to any specific and substantiated safety risks. The lack of detail appears to not meet the intent of the legislative requirement to provide reasons to refuse access.

In Section 5.5.4 of this report we learned that the HVNL is clear about the grounds on which access refusal can be based, and about granting access with risk-mitigating conditions if the requested unconditional access cannot be granted. At times, for example, a road manager will not be able to grant access on the grounds that one or more structures have insufficient capacity. Some jurisdictions in this position will offer access under travel conditions such as reduced mass or road conditions such as a variation to the proposed route. This approach to road access determination provides better outcomes for applicants. In one jurisdiction, any access request requiring bridge assessment results in an acceptable mass being advised, often less than the requested mass but perhaps acceptable to the applicant. In another jurisdiction, in one case familiar to the author, access was refused at Higher Mass Limits but not granted at an acceptable lower mass. Access was then requested at Concessional Mass Limits and again refused. Access was then requested at General Mass Limits and again refused. Access was then requested at Tier 1 mass limits (lower than General Mass Limits) and at the time of writing access had not been resolved. Each cycle of this process added weeks to the access request.

We also learned that in one particular case where a road manager had a strategic plan for network development, the plan was used under Section 156(3)(a)(ii) as a reason to refuse access because the NHVR's *Approved Guidelines for Granting Access* (National Heavy Vehicle Regulator, 2014) state:

> *Where the road manager has a strategic network designed for restricted access vehicles, it is reasonable for the road manager to propose alternative routes which make use of the strategic network. A strategic plan may be grounds for a decision not to consent to a grant of access or a decision to request the imposition of conditions provided that the plan fulfils the criteria required for a decision under the HVNL.*

The passage is not clear about how a strategic plan can reasonably be used as grounds for access refusal. In the particular case in question the content of the strategic plan was not made available to the applicant to demonstrate the rationale supporting access refusal.

Why it is important

Transport companies often wait up to six months to learn whether or not a proposed PBS combination may operate on a single point-to-point journey at a particular mass, only to be told that access cannot be granted and that—in some jurisdictions—no advice will be given on what mass would be acceptable.

That is why the law requires a road manager to grant access to the applicant unless access cannot be granted, even if it must be granted with conditions to mitigate any identified risks (such as a mass restriction over a particular structure, or an alternative route).

If this important piece of the HVNL is not appropriately drafted and complied with, it undermines the success of the PBS Scheme.

Options

With reference to the discussion presented in this section, the solution to this matter is sufficiently described to allow legislative drafting options to be prepared by appropriately qualified people.

One potential issue is how to enforce compliance with Section 156(3) if there is no penalty attached to it. If a penalty is not attached, then at the very least there should be a convenient avenue for an applicant to appeal a decision and have it considered by an independent body (refer to the relevant recommendation in Section 7.7).

Closing remarks

Enforcing Section 156(3) will improve the transparency of decision-making by road managers and accountability to the responsibilities that they have in facilitating heavy vehicle road access.

7.7 Recommendation #7 – Implement independent appeals process

Identify options for, and implement, an independent appeals process to handle appeals against adverse access decisions, to improve confidence in the delivery of due process.

What stakeholder consultation revealed

The process for decision reviews in the current HVNL does not include an independent body, but rather an internal review by the same organisation that made the initial decision. When compared with the alternative of an independent review body, internal reviews by the road manager may be less likely to:

- overturn an earlier decision by the road manager
- be objective

- be consistent with the decisions of other road managers under the same conditions
- test whether the road manager's internal policies are appropriate.

In Section 5.5.5 we learned that the above matters were raised as shortcomings of internal reviews in a report by the Australian Government's Administrative Review Council (2000).

Why it is important

Recommendation #6 espoused the importance of Section 156(3) of the HVNL in ensuring that access decisions are properly made. For the same reasons there should exist a reliable avenue for PBS road access applicants to appeal decisions that they believe have not been properly made.

Options

This recommendation first suggests that either a new independent body could be established, or an existing one tasked with a new responsibility, to accept applications of appeal from PBS road access applicants. The body should be independent of, and external to, any road manager and any other party involved in the PBS Scheme, including the NHVR. The body could operate in a manner consistent with the Civil and Administrative Appeals Tribunals that exist in various jurisdictions. Where required, the body could call on subject matter experts, such as professionals who can demonstrate a knowledge of the road assets in the region in question, or experts in heavy vehicle performance.

To be effective, any such body should have the power to overturn the decision of a road manager, after obtaining a written rationale supporting the initial decision, and to provide access where access is due. The body should of course only grant access if access can be granted under the provisions of the HVNL. For example, consideration must be given to infrastructure capacity, public safety and amenity, and where risks to either of those things are unacceptable, mitigating conditions should be imposed.

The independent body could do more than just handle appeals against PBS road access decisions. It could also handle complaints to, and appeals against the decisions of, the NHVR and the PBS Review Panel. A further benefit of the body would be to feed back into education materials (Recommendation #1) so that recurrent issues are resolved in the long term.

In the event that other mechanisms are put in place to mitigate the risk of improper access decisions, the need for this recommendation to be implemented may diminish.

Closing remarks

Stakeholders commented that an independent review body would be expensive and time-consuming to implement and, if implemented, would only add to the time and cost of access decision-making in the event of an improper decision first being made. Stakeholders suggested that resources would be better spent on educating road managers and setting in place processes to ensure that the correct decisions are made in the first instance.

7.8 Recommendation #8 – Implement better journey planning

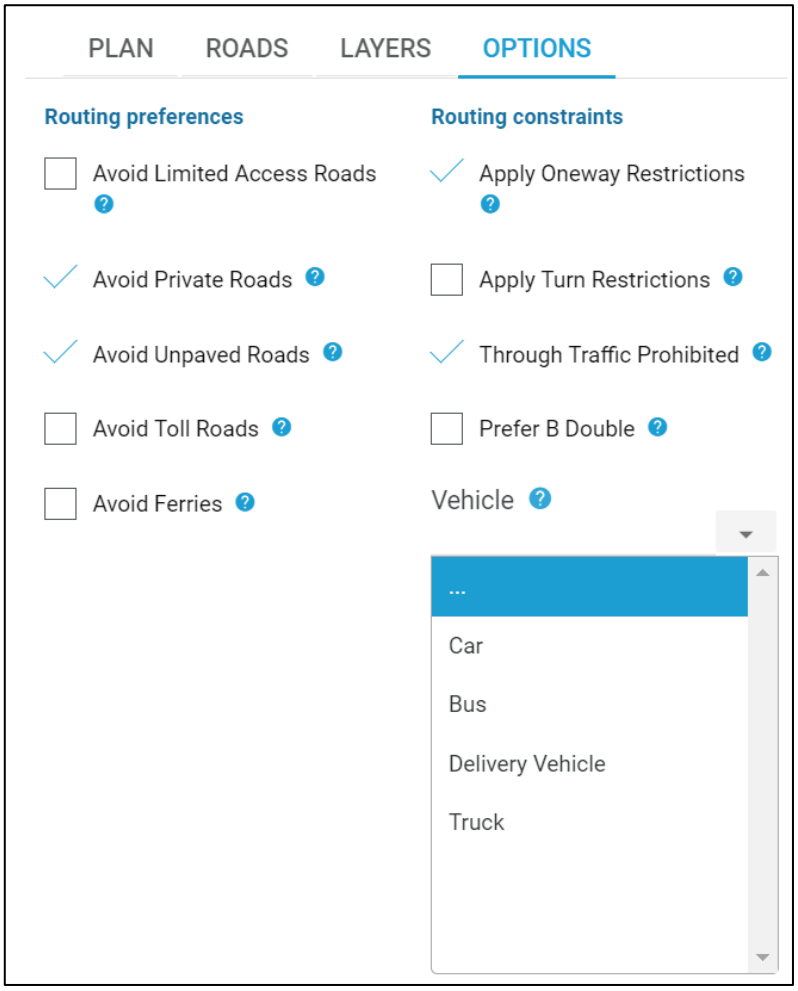
Improve the NHVR Journey Planner so that (a) automatically-generated routes between origins, waypoints and destinations take into account the vehicle classification, the various road classifications, and other considerations that can easily be built into the tool, and (b) it reflects in a more timely manner the updates that are frequently made to online maps managed by the state road authorities.

What stakeholder consultation revealed

When the NHVR Journey Planner plots a route between two or more locations, it will take a path that suits passenger cars and not necessarily one that suits the particular heavy vehicle combination of interest.

In Section 5.6.1 we learned that route planning capability does not sufficiently cater for PBS combinations; when seeking directions from one address to another, there is nowhere for the user to enter the vehicle configuration, its PBS classification, or its overall dimensions. The Route Planner has limited functionality for prioritising certain types of roads (Figure 7.2). Town bypasses, which are known to the tools, are not given automatic priority. As a result, by default the tools simply plot the most sensible route for a passenger car, which may not be the best route for the proposed heavy vehicle.

Figure 7.2: Routing options in the NHVR Route Planner



Source: https://www.service.nhvr.gov.au/#page=informationHub/routePlannerTool (accessed 27 August 2017)

Route planning tools should make more appropriate routing suggestions for heavy vehicles, and should better reflect the constantly updating road networks in each jurisdiction.

Why it is important

At present it is up to the transport operator to ensure that proposed routes are sensible by adding waypoints to direct the route the most appropriate way and using the limited options available, such as to prioritise B-double routes. Sometimes this may not be done correctly by the operator, if at all, and when the permit application reaches the road manager there is a potential barrier to access; the road manager will either not approve the application on the grounds that the route is inappropriate, or they may decide to suggest a more appropriate route.

The NHVR, as a facilitator in the process, has an opportunity to correct the routes or seek better suggestions from the applicant before sending requests to road managers. This does not appear to be happening. The best solution would, of course, be for the tool to do that work automatically, such that the NHVR only has to perform basic checks before passing the request on to the road managers.

Options

The following features should be considered:

- Allow users to enter optional additional information that may affect the tool's routing function, such as
  - Vehicle/combination length
  - Vehicle/combination height
  - Vehicle/combination PBS Level
  - Whether the applicant needs to avoid tunnels (e.g. Dangerous Goods)
  - Other useful routing options such as prioritising town bypasses
- Use roads suitable for
  - the specified vehicle/combination length
  - the specified vehicle/combination height
  - the specified vehicle/combination PBS Level
  - the applicant's routing preferences
- Suggest more than one option where alternatives with similar distance/time exist.

Closing remarks

At a time in the development of the PBS Scheme when road classification and mapping remains in its infancy, it is important that routing tools are as helpful as possible to both PBS road access applicants and road managers alike. Tools should provide the highest level of assistance possible, and they should facilitate communication of the likely barriers to road access, such as insufficient road classification for the last mile.

7.9 Recommendation #9 – Implement cost recovery options

Develop a suite of practice-ready cost recovery options to compensate for additional infrastructure consumption or to fund infrastructure upgrades.

What stakeholder consultation revealed

Some road managers acknowledged road user charges as a means by which road access could be granted for vehicles that increase the rate of consumption of the infrastructure, or to recover the costs of infrastructure assessments and upgrades to allow higher-productivity vehicles.

In Section 5.7 we learned that there are very limited practice-ready options for cost recovery, and that while small-scale infrastructure upgrades like kerb realignments were sometimes funded by a company that would benefit significantly from the improved access, large-scale infrastructure upgrades like bridge replacements were unlikely to be cost-recoverable without something like a per-trip fee being charged to the beneficiary companies over a period of time. The challenge here is how to identify and charge the beneficiary companies, and what to do when the number of participants is very large. We also learned about how different state road authorities manage cost recovery for infrastructure assessments.

In Section 6.5 we learned that the cost of administering cost recovery without a suitable framework can outweigh the benefits, due to the amount of backend processing that must take place when the number of participants is high.

Why it is important

It is becoming more common for technical barriers like road geometric standard and bridge capacity to be a barrier to access for larger, heavier PBS combinations. In these situations, things like education, physical trials, operating conditions and various other solutions discussed elsewhere in this document will not make access more probable; the best solution in these instances is infrastructure upgrades. If it is left up to the road manager to fund the infrastructure in its entirety, the road manager must weigh the costs of the upgrades against the benefits to the road manager of providing the upgrades. There will be little incentive to offer access when large investments are necessary, unless the road manager can recover the costs from the beneficiary companies. Those companies will be more easily able to justify a small per-trip cost to obtain the access if they can benefit directly from that access.

Options

Options for cost recovery of infrastructure assessments by road managers were discussed in Section 5.7.2. None of these are considered to be optimal for long-term, high-volume use. It is envisaged, however, that there will not be a long-term need for high volumes of these sorts of assessments. As the PBS Scheme continues to expand, road managers are expected to become sufficiently motivated to fund their own assessments without specific requests by transport companies. Therefore, it may be acceptable for these existing cost recovery arrangements to continue for the time being without seeking a better solution. It is recommended that this situation be properly reviewed to determine whether different solutions are required in the meantime.

In terms of funding infrastructure upgrades, we must consider two factors before deciding on the most appropriate approach for a given scenario, because different scenarios require different solutions:

- **The level of network access.** Will the access be to one road (last mile), a small number of roads contained within a small area, a specific journey, many different journeys, a specific network or General Access?
- **The number of participants.** Will the access benefit one company, a small number of companies, a large number of known companies or a large number of unknown companies? Will all beneficiaries participate in the cost recovery?

The National Telematics Framework provides a solid foundation on which to base cost recovery solutions that use GPS-based vehicle tracking. It provides assurance of the integrity of the equipment fitted to vehicles, and of the data collected by that equipment and transmitted to service providers for processing and storage. Many PBS vehicle operators will already have the required In-Vehicle Unit (IVU) as a participant in the Intelligent Access Program (IAP). In terms of *the level of network access*, the National Telematics Framework can offer different kinds of solutions to suit different access scenarios. The matter of *the number of participants* is one that presents more pressing challenges, because of the limited number of vehicles with IVUs already fitted, and the apparent resistance to its take-up by the industry without significant productivity benefits. There is no reason to believe that the Framework could not support the number of new participants that might join for PBS vehicle access, should those participants find it beneficial to join.

Separate from GPS-based cost recovery using the National Telematics Framework, there may still be simple options allowing individual transport companies to obtain enhanced road access for a high-productivity vehicle by paying the cost of providing that access. While the specific details of such agreements are to be determined by the parties involved, road managers felt that there was insufficient support in terms of legal guidance and contractual arrangements to enable these options to be taken up confidently. Therefore it is also recommended that options for these simple solutions, generally suited to one or a small number of beneficiary companies accessing one or a small number of roads, be investigated and developed.

The National Transport Commission (NTC) is reviewing the use of telematics for regulatory purposes across the transport sector in order to find ways to encourage further take-up and realise safety and productivity benefits (National Transport Commission, 2017). The Transport and Infrastructure Senior Officials' Committee (TISOC) has directed the NTC to consult with transport operators, telematics service providers, road agencies, and government certification agencies to help identify opportunities to more effectively harness the benefits of emerging technology solutions.

The Federal Minister for Urban Infrastructure and Cities announced in 2017 that the Government is working with states and territories to investigate reforms to the way that heavy vehicles are charged to use roads (Minister for Urban Infrastructure and Cities, 2017). The Government intends to invite the heavy vehicle industry to participate in a National Heavy Vehicle Charging Pilot that will test the replacement of existing registration fees and fuel-based road user charges with a national direct user charge.

Closing remarks

The foundations for a suite of world-class GPS-based cost recovery systems is already offered by the National Telematics Framework. Where a simpler solution will suffice, it is recommended that road managers are supported in developing those solutions.

7.10 Recommendation #10 – Update route assessment tools

Update the PBS Network Classification Guidelines to reflect the more advanced route assessment guidelines used by state road authorities and to include additional considerations specific to local councils. Update the Restricted Access Vehicle Route Assessment Tool (RAVRAT) to reflect the changes.

What stakeholder consultation revealed

There is insufficient guidance for local councils in the PBS Network Classification Guidelines (National Transport Commission, 2007) and the RAVRAT software that is intended to simplify the application of the guidelines.

In Sections 5.2.3 and 5.8 we learned that local councils have specific concerns related to site access that are mostly irrelevant to state road authorities, and that the guidelines appear to have been prepared only for consideration of through-traffic. We also learned that the RAVRAT does not incorporate some of the most important aspects of road access decision-making, such as bridge loading assessment and swept path assessment.

Why it is important

We have highlighted the resourcing issues faced by many local councils, and the importance of lightening their burden. The guidelines and the software tool are important existing means by which the burden on local councils can be lightened; if they were adequately developed they could potentially save a large proportion of the time that a local road manager would otherwise have to spend to make a road access decision. The tools have been identified as being insufficient for that purpose at present, so it is important that something is done to address those concerns.

Options

Numerous state road authorities have developed route assessment guidelines that build on the National Transport Commission's PBS Network Classification Guidelines (2007). Examples include Department of Infrastructure, Energy and Resources (2011), Department for Transport, Energy and Infrastructure (2008 & 2009), Department of Transport and Main Roads (2013 & 2014), Main Roads Western Australia (2014) and Roads and Maritime Services New South Wales (2012). Some of the jurisdictions' own guidelines build on elements of the PBS guidelines by providing more detail than the general advice given in the PBS guidelines. Some contain elements that are not even identified in the PBS guidelines.

It is recommended that a review of the PBS Network Classification Guidelines be conducted in consultation with local road managers, taking into consideration the guidelines developed by state road authorities, to identify and fill the gaps as necessary to satisfy local road managers' needs.

It is recommended that the RAVRAT is updated as much as practicable to reflect the revised PBS Network Classification Guidelines.

It may be necessary to offer training or other assistance to local road managers wishing to make use of the new guidelines or the new RAVRAT.

Closing remarks

Local road managers could be better supported in their access decision-making responsibility if comprehensive and more accessible route assessment tools were made available.

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Appendix A Online Survey Questions

Page 1: Served to all respondents

NEF2096 - Local Road Access for High Productivity Freight Vehicles - Stakeholder survey

Performance Based Standards (PBS) vehicles, also known as High Productivity Freight Vehicles (HPFV), typically require road access to be approved by one or more road managers. When it comes to local roads ('the last mile'), there may be deficiencies in the capacity of the infrastructure to accommodate some vehicles, or simply in the capacity of the local road manager to evaluate certain access requests. Regardless of the type of barrier to last mile PBS road access, many barriers can be overcome.

This stakeholder survey is a component of Austroads project NEF2096, *Local Road Access for High Productivity Freight Vehicles*. Austroads is funded by all states and territories to support member organisations to deliver an improved Australasian road transport network. For more information go to www.austroads.com.au.

The intent of this survey is to compile and disseminate knowledge that will help all road managers and other practitioners to better understand the nature of last mile access issues, and what can be done to overcome them, in the short term.

To this end, the survey will compile knowledge on:

- the perceived or actual barriers that prevent road managers from granting access
- options to address those barriers
- case studies demonstrating how such barriers were successfully overcome.

The survey is aimed at both local road managers who determine road access for PBS vehicles and transport industry professionals who have sought road access for PBS vehicles.

* Which of the following statements best suits you?

- ◯ I have a role in deciding whether PBS vehicles may use the roads in a Local Government Area.
- ◯ I have previously requested road access for a PBS vehicle where local government consent was required for part of the route.
- ◯ I would rather have somebody call me for a chat.

Page 2: Served to all respondents who selected the first option in the first question

* Which Local Government Area do you represent?

* Select State/Territory

* Have you ever contributed to a road access decision for a PBS vehicle?

- ◯ Yes
- ◯ No

Page 3: Served to all respondents who answered YES to the previous question

* Approximately how many PBS road access decisions have you contributed to in the past 3 years?

* Approximately what percentage of those decisions resulted in access approval?

0 100

* Are you aware of any instances where a barrier to PBS road access in your LGA was initially identified but ultimately overcome?

- Yes
- No

Page 4: Served to all respondents who answered YES to the previous question

* Please provide details of that instance. What was the barrier, and how was it overcome?

Page 5: Served to all respondents who selected the first option in the first question

* What is the likelihood of each of the following issues preventing road access for a PBS vehicle in your LGA?

	LOW	MEDIUM	HIGH
Understanding of the vehicle configuration	○	○	○
Concerns about road safety	○	○	○
Access to evaluation tools and guidelines	○	○	○
Information about infrastructure capacity (geometric, structural)	○	○	○
Geometric capacity to handle longer combinations	○	○	○
Bridge structural capacity to handle heavier combinations	○	○	○
Effect on infrastructure maintenance intervals and life cycle costs	○	○	○
Resources to conduct evaluations	○	○	○
Amenity considerations	○	○	○
Concern about setting a precedent and 'opening the floodgates'	○	○	○
Compliance with conditions such as speed, mass, time-of-day and approved routes	○	○	○

Did we miss any issues in the above list? Please detail them here.

Briefly list the ways you think any of these issues could be overcome.

Page 6: Served to all respondents who selected the second option in the first question

* In which States/Territories have you applied for road access for a PBS vehicle?

- ☐ New South Wales / Australian Capital Territory
- ☐ Northern Territory
- ☐ Queensland
- ☐ South Australia
- ☐ Tasmania
- ☐ Victoria
- ☐ Western Australia

[OPTIONAL] For one SUCCESSFUL access request involving local roads, please provide as much detail as possible in the fields below

Vehicle configuration (e.g. A-double, truck and dog)	
Gross Combination Mass	
Overall Combination Length	
Local Government Area(s) in which access was granted	
Level of access requested (e.g. Level 1, Level 2A, Level 2B)	
Journey IDs and version numbers (if applicable)	
Case Number	
What barriers, if any, were initially identified by a local road manager but ultimately overcome in achieving this result? How were the barriers overcome?	

[OPTIONAL] For one UNSUCCESSFUL access request involving local roads, please provide as much detail as possible in the fields below

Vehicle configuration (e.g. A-double, truck and dog)	
Gross Combination Mass	
Overall Combination Length	
Local Government Area(s) in which access was refused	
Level of access requested (e.g. Level 1, Level 2A, Level 2B)	
Journey IDs and version numbers (if applicable)	
Case Number	
What were the reasons given for access refusal by a local road manager?	

Page 7: Served to all respondents

If you would be happy for someone to call you to discuss your experiences further, please provide contact details below.

Name	
Position	
Company	
Email address	
Phone number (fixed line or mobile)	
Preferred days or times of day for phone call	

NOTE: Contact details will not be published. Any information provided in the survey that we decide to publish will be published anonymously. Providing your contact details does not guarantee that you will be contacted.

Appendix B PBS Benefits Flyer (MRWA)

AUGUST 2017

Performance Based Standards (PBS) Benefits

PBS Overview

The Performance Based Standards (PBS) Scheme offers potential for heavy vehicle operators to achieve higher productivity and improved safety through innovative vehicle designs. The PBS Scheme focuses on how well a vehicle performs on the road, by assessing the particular vehicle design against a set of safety standards, rather than assessing a vehicle based on prescriptive limits.

Vehicle Safety

Austroads published a report on *Quantifying the Benefits of High Productivity Vehicles*. The report found that if the overall freight task was completed by PBS vehicles rather than conventional heavy vehicles, a reduction in heavy vehicle crashes of 66% would be expected.

A crash rate reduction of between 57% and 85% was observed for all four of the examined severity ranks (minor, moderate, serious and major), resulting in an estimated saving of 96 lives by 2030, valued in the order of $156 million by 2030.

PBS vehicles are specifically designed to achieve improved safety outcomes and the PBS assessment ensures the vehicles meet a minimum safety performance standard, as outlined in the *PBS Assessment Rules and Standards*.

Each PBS vehicle is certified to ensure it meets the particular PBS design specifications, as opposed to conventional road trains that consist of any licensed prime mover and trailer coupled together.

The PBS vehicles are then permitted as a specific combination to ensure the vehicle is operating in the safest configuration, i.e. the positioning of each trailer is specified and they cannot be repositioned unless assessed and approved.

Further checks are conducted on PBS vehicles to ensure the most appropriate towing vehicles are used and appropriate components are used, such as sufficiently rated tow couplings and specific category of tyres.

Braking capability and vehicle stability is also improved on PBS vehicles with the mandatory requirement in WA for Electronic Braking Systems (EBS) with Rollover Stability System (RSS), which is not a requirement on conventional road trains.

PBS vehicles are often height restricted, which is determined by the PBS assessment, as opposed to conventional road trains that are allowed up to 4.6 metres in height under regulation. This further reduces the rollover risk of PBS vehicles and improves overall stability due to the reduced load height centre of gravity.

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Pavement & Bridge Impact

PBS vehicles are not considered to cause additional road wear compared to conventional heavy vehicles.

Higher productivity PBS vehicles have the same maximum axle loads as conventional heavy vehicles, but have more axle groups to carry a higher payload.

Even though a higher productivity PBS vehicle may have a greater Equivalent Standard Axle (ESA) calculation than a conventional heavy vehicle, the increased payload means fewer PBS vehicle movements would be required to complete any given transport task, resulting in less pavement damage (fewer individual axle loads) than if the transport task was completed with a higher number of conventional heavy vehicles.

In addition, PBS vehicles approved under the WA PBS Scheme are subject to more stringent axle spacing requirements, which further reduce the impact on the road infrastructure.

Productivity & Efficiency

There are clear productivity benefits associated with PBS vehicles. Current operators of high productivity PBS vehicles have reported significant productivity and efficiency benefits of up to 25%, taking into account the reduced number of journeys and reduced loading / unloading times.

Even with the larger high productivity vehicles, the improved efficiency of the PBS vehicles has also been reported to provide cost savings due to less fuel consumption.

Traffic

Higher productivity PBS vehicles reduce the number of vehicle movements for a given transport task compared to conventional heavy vehicles, which reduces congestion and the crash risk exposure.

Although PBS vehicles are often slightly longer than conventional heavy vehicles, the safety benefits outweigh any negative concerns, particularly as the length differential is no greater than for the various conventional heavy vehicle categories.

Environment

A higher productivity PBS vehicle is able to perform the transport task in fewer journeys than a conventional heavy vehicle, which results in reduced carbon emissions.

Further to this, the PBS approved vehicles generally consist of newer prime movers, which have improved emission ratings.

Further Information

For more information about PBS in Western Australia, please visit the PBS page on our website at https://www.mainroads.wa.gov.au/UsingRoads/HeavyVehicles/Pages/Performance.aspx or contact the Main Roads Heavy Vehicle Services HVS Helpdesk on 138 486.

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