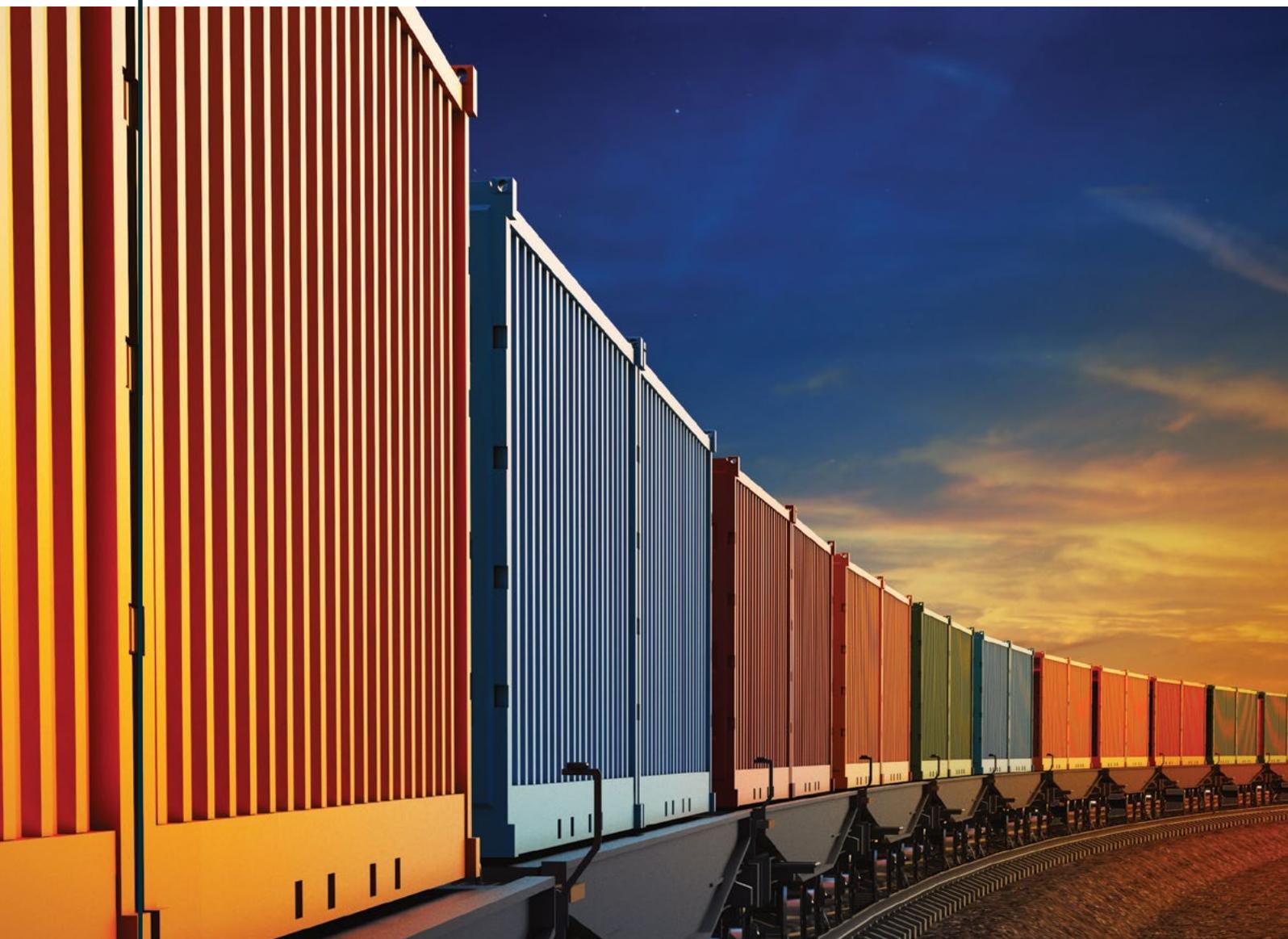


# Freight Modal Shift

## Mode Shift Impediments and Opportunities

Prepared by GHD Advisory

March 2022





GWN

002



IRP CP BP MREQ

MREQ BP CP IRP

# Contents

<b>1. Executive summary</b>	<b>05</b>
<b>2. Introduction</b>	<b>07</b>
Objective	09
A note to readers	09
<b>3. Impediments and opportunities</b>	<b>11</b>
Impediments to mode shift	12
<b>4. Factors impeding mode shift</b>	<b>13</b>
Distance	15
Train size	17
Handling costs	19
Last mile costs	21
Train speed	25
Axel load and double stacking	26
Freight volume	27
Service levels and competition	29
Market barriers	30
Commercial	31
Available freight type	32
Compliance, regulation, labour and infrastructure costs	33
Multiple rail guages	35
Rail freight line infrastructure	36
Road productivity	37
Coastal shipping by international vessels	38
Economic assessment and infrastructure funding	38
<b>5. Impediment summary and recommended actions</b>	<b>41</b>



# 1. Executive summary



As a means to move freight, rail works. In many instances, it is the stand-out performer when compared to other modes of transport. This is particularly true for moving heavy bulk material over longer distances.

In terms of tonne kilometres, rail moves approximately 40%<sup>1</sup> of the overall freight task in Australia, however rails share of inter capital non-bulk freight is closer to between 10-15%<sup>1</sup>.

The mode share of rail in and out of our ports also varies, however generally this share tends to be lower than Government aspirations and industry expectations. Rails share of freight movements in and out of container ports is anywhere between 2-17%<sup>2</sup> despite numerous state policies aiming to achieve up to 30% mode share at various times over the last decade or so. These higher mode share goals reflect the fact that the benefits of increased rail freight use is clear. Increased environmental outcomes, improved amenity, increased safety, and decreased road congestion are all outcomes worth achieving.

This being the case, why has rail not achieved a higher share of the freight task, particularly in the non-long-haul or non-bulk markets? This is the question that the Australasian Railway Association (ARA) and specifically its Rail Freight Executive Committee are seeking to answer. A key first step to answering these questions was identifying the opportunities as well as the impediments to increasing freight rail share.

Following engagement with industry, a problem definition and root cause analysis, the key impediments were identified. A rail operations and cost model was then used by consultants GHD to analyse impediments quantitatively, including understanding sensitivities between various attributes such as journey distances, train utilisation, handling costs, turn-around time and travelling speeds (to name a few)<sup>3</sup>.

Both qualitative and quantitative analysis demonstrated there are few insurmountable impediments, and that largely to overcome one impediment, such as travelling short distances, other factors can be improved to counteract the effects on viability.

This report is a summary of the identified impediments and opportunities to address them in enabling rail freight to achieve a higher market share of the overall freight task.

### Increasing freight rail mode share



<sup>1</sup> Bureau of Infrastructure and Transport Research Economics (BITRE)

<sup>2</sup> BITRE Waterline Reports

<sup>3</sup> Variables are modelled on a ceteris paribus basis to demonstrate the sensitivities related to one potential impediment

# 2.

# Introduction



The Rail Freight Executive Committee is an executive committee of the Australasian Railway Association (ARA) and a long-standing contributor to advancing the role of rail in the port and freight sector in Australia and New Zealand.

**The Rail Freight Executive Committee's objectives include:**

- 1. Encouraging greater modal shift to rail freight**
- 2. Increasing infrastructure investment in priority freight rail projects**

Identifying and defining some of the challenges required to achieve these objectives will assist in focusing and informing future efforts of the ARA.



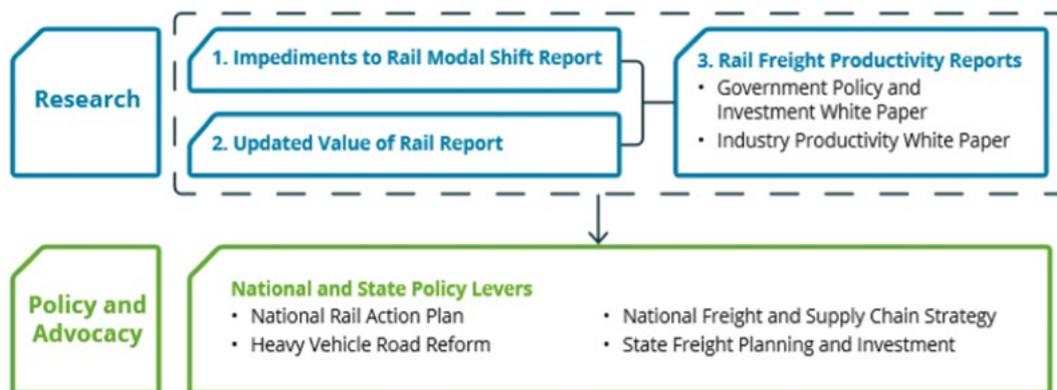
# Objective

The objective of this research is to identify impediments to rail freight achieving a higher market share of the overall freight task.

In defining impediments, we will be better informed when developing approaches and strategies to improve rail's share of the freight task now and in the future.

This research task is part of a wider research and advocacy program as illustrated in **Figure 1** below.

**Figure 1: ARA rail freight research focus**



## A note to readers

As the purpose of this study is to investigate impediments to rail mode shift, the focus of this research is therefore in areas where there are more pronounced impediments combined with freight growth potential.

This has meant our focus is not in areas where rail has a dominant position for instance long-haul bulk movements. This does not imply longer haul or bulk rail freight does not have impediments, but they are more pronounced in the cases this report is focused on.

The analysis included in this report is based on representative inputs and assumptions used to put tangible numbers behind investigations to understand impediments. They should be interpreted as representative of a demonstrative instance and not as an indicator of a particular service's viability or otherwise.



# 3. Impediments and **opportunities**



# Impediments to mode shift

In many instances, rail has a significant advantage over other modes. It is well understood that rail works particularly well over longer distances with heavier commodities.

This is demonstrated by the fact that rail freight currently consists of approximately 90% bulk and 10% intermodal in terms of gross tonne kilometres travelled<sup>4</sup>.

This report focusses on the viability of rail and what factors, or combination of ingredients, are required for rail freight to be more successful in non-long-haul bulk areas.

For each identified impediment the research reviewed its severity in terms of its potential effect on mode viability and to what extent it could be influenced or changed. Impediments were also ranked in terms of their impact and their ability to influence the identification of opportunity areas.

## Impediments to mode shift

Mode shift is assessed in terms of rail's viability as it relates to being the best mode option available. This report compares rail's proposition with the best alternative, which is often road. This is not a road versus rail report, we use road as a benchmark in terms of viable cost and services levels. While the report's focus is rail, it also investigates optimal modal mix and discusses how road can make rail viable where in isolation it would likely not be.



<sup>4</sup> Deloitte modelling using BITRE estimates of state breakdown that ended in 2009-10.

# 4. Factors impeding **mode shift**



We have taken an applied approach to understanding and conveying impediments to rail mode shift by posing commonly asked questions or statements.

Matters are discussed in a straightforward manner and analysis is often shown to demonstrate sensitivities rather than using absolute values however the analysis shown is based on detailed modelling and stakeholder input.

The Bureau of Infrastructure, Transport and Regional Economics (BITRE) released a paper in 2016 titled “Why short-haul intermodal rail services succeed” which highlighted some of the required ingredients for short haul freight rail's success.

The BITRE paper concluded that three components are required for short haul rail success:

1. Minimised road access and egress — drayage — costs between hinterland and intermodal terminal
2. Low rail linehaul costs and high road
3. Interest groups with motivations to encourage short-haul and viable hinterland terminals

A key conclusion of the paper was that relative mode competitiveness is strengthened when there are deficiencies in truck haulage. In this report, we seek to take this further and better understand the ingredients required for rail to be successful over shorter distances even when road is not disadvantaged or deficient in some way.

It is true that when we consider mode viability in terms of cost competitiveness it may be that costs for other modes are increasing, such as road tolls, which may narrow the cost variance. However, largely we are looking at factors that affect the cost of rail as opposed to other modes.



# Distance

**Severity of impediment: High**

**Ability to change/influence: Medium**

**Relevance: Interstate, Regional and Short-Haul Rail**

## Does distance matter and what can be done to counter the tyranny of distance?

Distance does matter, however the extent to which it matters or is an impediment to the success of rail depends on a range of factors. It is known for example that short haul rail struggles to compete or gain sufficient scale to be competitive with road; however, what ingredients are required to shorten this viable distance?

### So, why does distance matter?

Distance itself does not matter, it is all about productivity and asset utilisation. Greater distances help achieve higher productivity from the most expensive assets. A train in motion is a train creating value and earning revenue. Over shorter distances it is more likely that rolling stock will spend proportionally more time not in motion for instance activities such as loading/unloading, provisioning, arriving and departure activities and waiting for network or terminal access windows.

It is also more likely that over short distances only shorter length trains may be permitted. This may be due to limitations in metropolitan networks or port and metropolitan terminals.

Therefore, to overcome the tyranny of distance, rail needs to increase productivity of its shorter haul services in other areas to compensate.

## How can rail counter the tyranny of distance?

A list of productivity enhancements which lower the impediments to rail mode shift related to shorter journey distances is outlined below:

- Train cycles per 24hr period<sup>5</sup>
- Train utilisation (how many wagons are carrying payloads)
- Train travel time (high average speed and minimal delays)
- Turnaround time at terminals

## What does the analysis tell us?

To understand how these variables affect rail viability, the research mapped distance against other factors to better understand sensitivities, determining to what extent shorter distances can be countered and how feasible these counter measures may be.

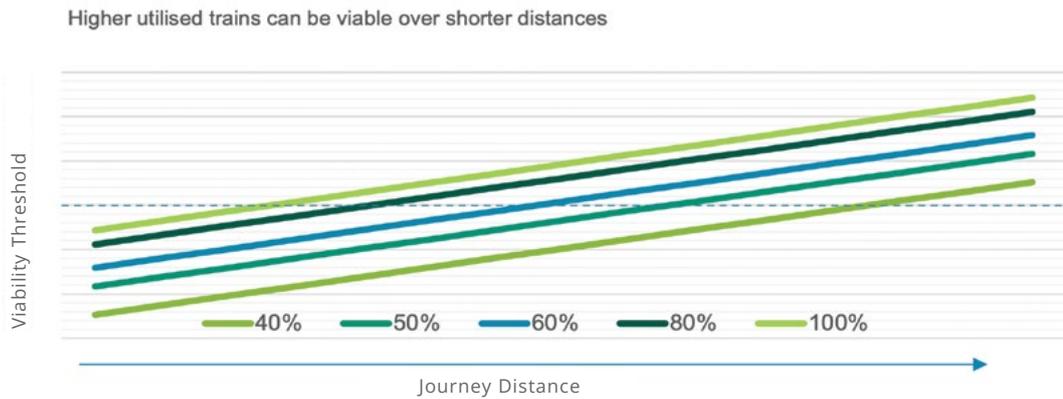
*Note: As with all analysis contained in this report the relativities between variables are only true given the inputs and assumptions made in the various scenarios modelled. These are representative of a specific demonstration case only.*

## The relationship between viable distance and train utilisation

**Figure 2**, over the page, uses an Inland Rail reference train of 1800m and is based on a 10km first and last mile leg.

<sup>5</sup> Train cycles means round trips. The significance of 24 hours is that a regular schedule can be maintained if cycles are contained within a 24-hour period.

**Figure 2: Sensitivity between viable distance and train utilisation**



**What this tells us: Viable rail distances are quite sensitive to changes in other factors, including train utilisation<sup>6</sup>.**

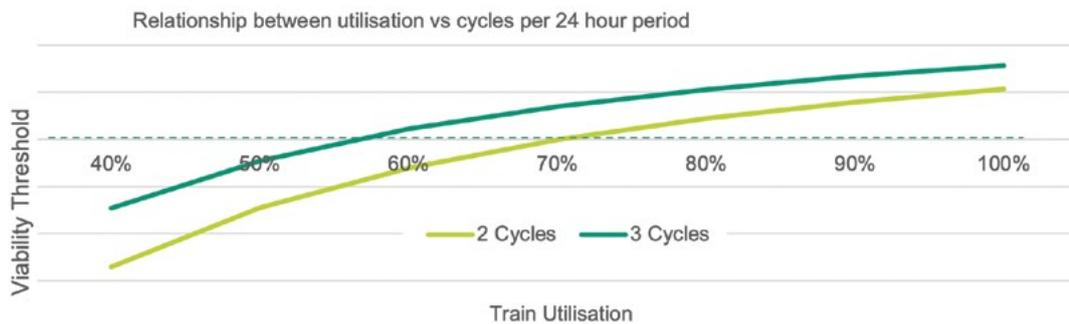
Analysis showed that in a specific reference case based on an 1800m train, an increase in utilisation of 30% resulted in the viable distance reducing by 50km<sup>7</sup>.

As stated, distance is important as it increases the productivity of rail, the longer the distance

the more productivity achieved. For shorter-haul rail this productivity benefit manifests itself in terms of cycles per 24-hour period.

Potentially the most impactful way for rail to be competitive across shorter distances is to increase the number of train round trips to 'cycles' per 24-hour period. This aligns with the position that productivity is all about keeping trains moving regardless of the journey distance.

**Figure 3: Cycles per 24-hour period versus utilisation**



**What this tells us: If train cycles can be increased per period from two to three then trains will be competitive at lower utilisation levels.**

In creating the sensitivity curves in **Figure 3**, the research used a specific reference case whereby if a train service can only achieve a maximum utilisation of 60%, it will need to operate three round-trips per 24 hour period to be viable (cost competitive).

<sup>6</sup> Train utilisation is the percentage of wagons that are carrying payloads. This is a round-trip utilisation, for instance a train that is full in one direction but empty on the return leg would have an overall utilisation of 50%.

<sup>7</sup> This statistic is based on a specific reference train to demonstrate the sensitivity between utilisation and viable distance, other rail reference cases will have other sensitivity profiles.

# Train size matter

**Severity of impediment: Medium**  
**Ability to change/influence: Medium-High**  
**Relevance: Interstate and Regional Rail**

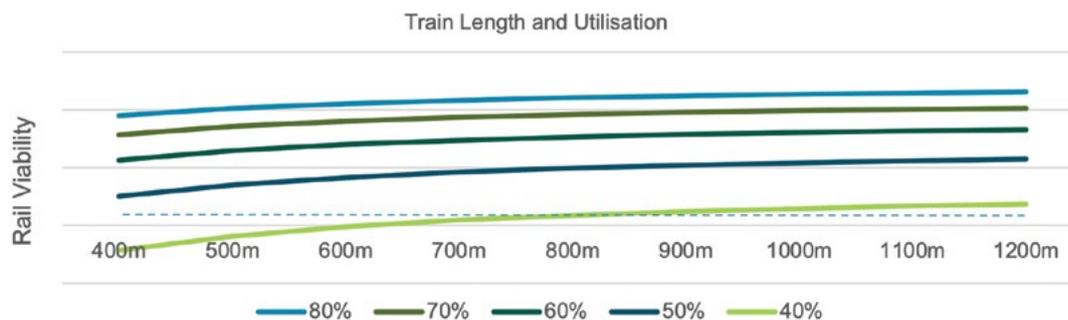
Does train size matter? To what extent is the length of a train an impediment?

We know that longer trains, if also well-utilised, have benefits of greater fixed-cost dilution making each additional wagon load, or container, less expensive to move and therefore more cost competitive. But to what extent does train length really matter,

and where does it matter? Train length is sometimes seen as an impediment to viability as it may relate to a hard network constraint, or a constraint driven by terminal access (making and breaking trains).

**Figure 4** highlights a regional train reference case whereby the relative competitiveness of a train of different lengths is compared across two journey distance types.

**Figure 4: Viability sensitivity of train length and journey distance**

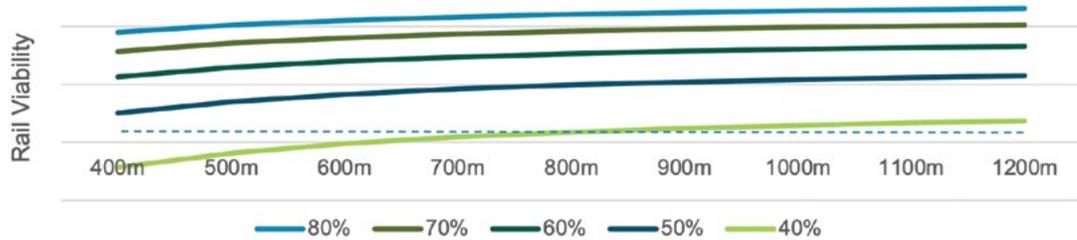


**What this tells us: That distance travelled has a far greater effect on cost than train length.**

Interestingly, it was also observed that train length makes proportionally less of a difference over shorter distances, suggesting

that metropolitan network length restrictions may not be as significant an impediment as other productivity variables.

**Figure 5: Viability sensitivity between train length and utilisation**

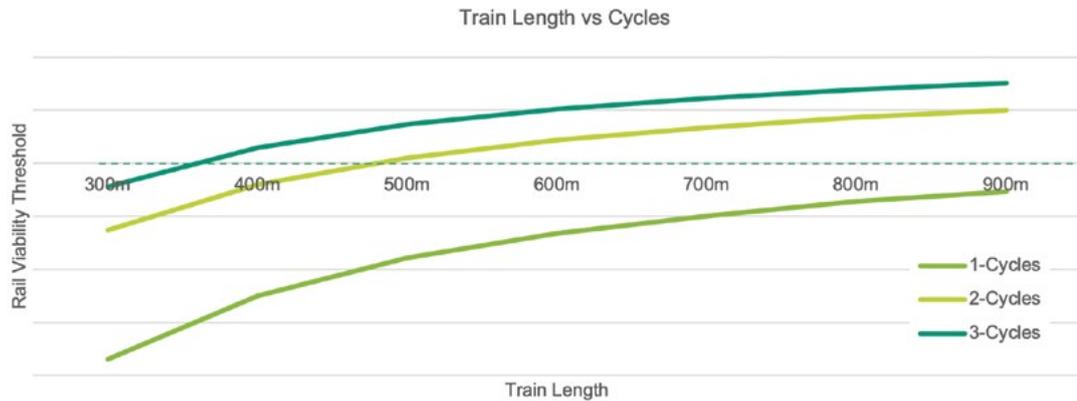


### Train length and utilisation

To better understand the effect that train lengths have on viability it is worth looking at them in the context of other variables. **Figure 5** shows the sensitivity between train length and utilisation as it relates to viability.

**What this tells us: Train length is not a counter for low utilisation, however high utilisation can make shorter trains more viable and competitive.**

**Figure 6: Viability sensitivity, train length and cycles**



### Train length versus cycles per 24 hour period

The importance of train cycles per period has already been covered, however, to better understand and convey the relative importance of train length these variables have been mapped together. The reference case depicted in **Figure 6** is a short haul rail service.

**What this tells us: As rail's competitiveness is linked to productivity, having a long train only doing one cycle per day is not preferable over a shorter train doing three to four cycles per 24 hour period.**

# Handling costs

**Severity of impediment: High**  
**Ability to change/influence: Medium**  
**Relevance: Regional and Interstate Rail**

Utilising rail can often mean extra handling of freight; how significant an impediment is this? Handling costs at ports have been attributed to a lack of mode share; however, would lower handling costs make a difference? If so, by how much?

An interesting development over the last few decades, which has accelerated in recent years, has been the increased hubbing or staging of freight whether it be road or rail. For example, the 2009 Container Logistics Chain Study completed by the Port of Melbourne Corporation (PoMC) concluded that 77% of imports were staged after leaving the port.

Compare this to less than a decade or so earlier when most imports were delivered direct to the unpack point. This highlights that the economics of rail/road transportation

were changing.

Road operators are now choosing to stage containers prior to delivering to customers. This has started to put rail on a more even keel with regard to handling costs, however rail terminals are generally more expensive to build and operate than road, highlighting a need for further analysis and understanding.

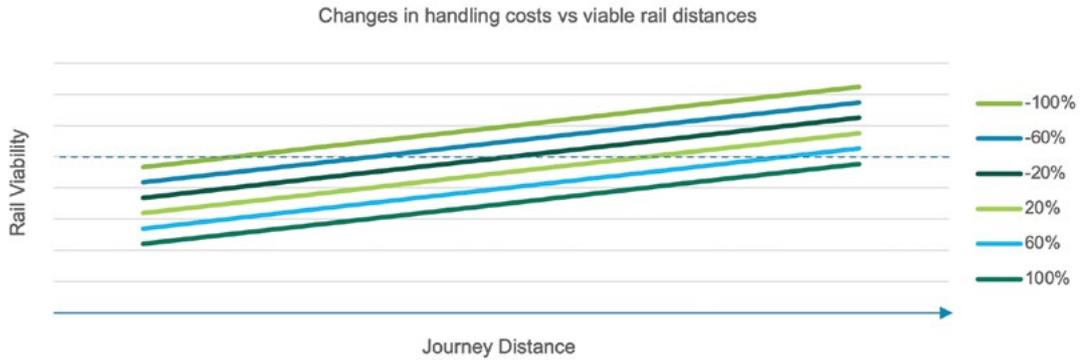
In terms of Import/ Export (IMEX) freight, it can often be the case that both the inland terminal and the port terminals are more expensive in terms of handling when compared to road hubs. This can be attributed to the following factors:

- Port rail terminals are on high value land, use higher cost labour, and compete for investment with profitable alternatives<sup>8</sup>
- Inland rail terminals may have lower utilisation rates when compared to road hubs, so have limited fixed cost dilution. In fact in some instances only one rail service per day may call at an inland rail terminal.



<sup>8</sup> Required return on investment hurdle rates may be higher due to high opportunity cost (alternative investment ROI). This likely leads to a higher Weighted Average Cost of Capital (WACC) for investments on or near ports vs other locations.

**Figure 7: Sensitivity between handling costs and viable (competitive) distances**



### Handling cost versus viable journey distance

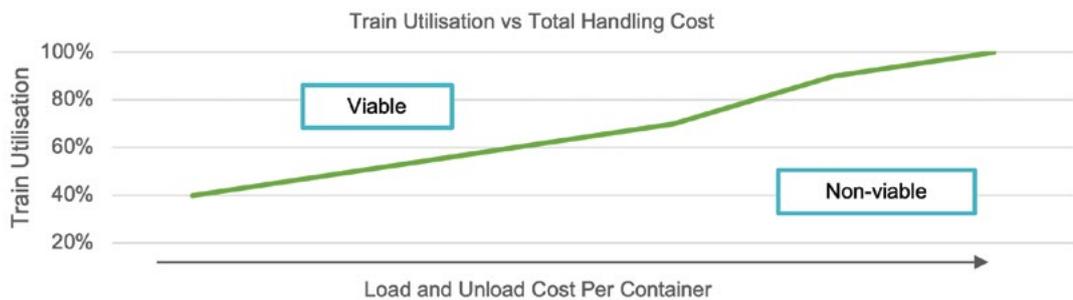
Figure 7 above shows the sensitivity between handling costs, journey distance, and viability (cost competitiveness).

**What this tells us: If handling costs were halved then the viable distance of this type of train would decrease by 25%.**

In addition, the effect of handling costs has

a more profound effect the shorter the rail service is. This is due to that fact that proportionally the handling costs costs, diluted among fewer kilometres. Therefore, even if rail is less expensive than road when it is in motion, these handling costs can erode or entirely counter any line haul cost savings.

**Figure 8: Viability sensitivity versus utilisation and handling costs**



### Total handling costs versus utilisation for a short haul rail service

To understand the impact of handling costs further Figure 8 depicts them in the context of train utilisation. The analysis, along with cycle's per day, presents the steepest sensitivity gradient observed, meaning that the two variables together have a significant impact on rail viability and therefore mode share.

**What this tells us: Based on a specifically modelled short-haul reference case, the sensitivity analysis demonstrated that if handling costs increased by \$10 per container, trains may need an additional 10% utilisation to be viable.**

# Last mile costs

As rail is often not a door-to-door service, a last mile road move at one or either end of the rail journey is required. How significant is this as an impediment to mode shift?

Last mile costs are often considered a significant impediment to rail mode viability. A truck's ability to deliver freight door-to-door is a reason for road's competitive edge in many instances.

Along with handling costs, last mile costs largely determine the viable freight catchment area of a rail terminal and therefore rail service. The lower the handling and last mile costs, the larger the freight catchment area for rail.

A good analogy here is a long-haul rail service that performs a 'milk run' picking up and dropping off freight along its route. The closer it gets to its ultimate destination the smaller the viable last mile distance is.

## Last mile distance vs rail journey distance

To best understand and convey the relative impact that last mile costs may have on rail viability (cost competitiveness) it is important to see it in the context of another known variable. **Figure 9** looks at the viability sensitivity of rail with regard to changes in last mile distance and journey distance.

**Figure 9: Sensitivity of rail viability versus journey distance and last mile distance**



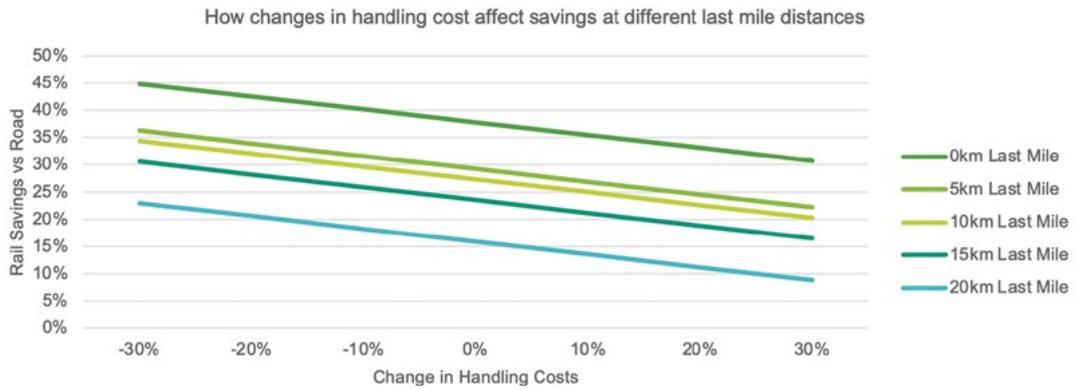
**What this tells us: That the shorter the rail journey is, the smaller the viable catchment area is. As the proportion of handling and last mile costs as compared to linehaul movement is relatively higher, it creates a greater impediment.**

This is not a revelation in itself; however, it shows that for shorter haul rail services it is of critical importance that last mile distances, and therefore costs, are minimised.

As **Figure 10** on the next page demonstrates, last mile together with handling costs have a significant effect on viable rail distances.

Having rail terminals located near rail users or cargo owners, is of critical importance to rail being competitive. This is especially true for short haul rail services, and as these services have high growth potential in metropolitan areas, this co-location of rail infrastructure and cargo owners creates land use planning challenges.

**Figure 10: Sensitivity between rail cost competitiveness and handling costs**



### Last mile distance and handling costs

Changes in handling costs greatly affect the savings attributed to rail versus other modes. Handling costs are something that can be influenced, improved, or in some cases subsidised in order to improve the economics of rail.

**What this tells us: The price elasticity of rail as a function of handling cost changes. If you are operating a viable service and delivering 25% cost savings to you customers versus road and your handling costs increase by 30% your catchment may shrink by two thirds.**

### What is the effect of co-locating rail users within a rail terminal precinct?

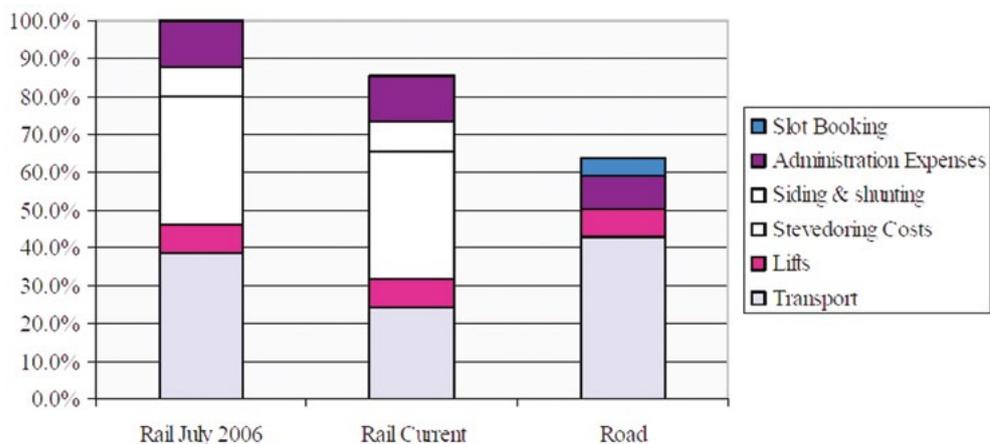
Co-locating rail freight users in or adjacent to intermodal terminals is a tried and true method of increasing the viability of rail as it significantly diminishes last mile costs. This clustering also enables other rail viability-enhancing opportunities such as co-locating importers and exporters with empty container parks. The effect of this is reflected in Figure 10 where the last mile is shown as 0km. Due to last mile cost reductions the savings delivered by rail are 10% more if the freight customer is located at the inland terminal.



# Handling cost case studies

## CASE STUDY: CRT GROUP

**Figure 11: CRT Group - Rail versus Road Costs**



When looking at rail impediments it is invaluable to use real world cases. Observing fledgling or failed services is the best way to be sure of real impediments faced. In 2005, CRT was moving over 600,000 tonnes of freight a year before it was acquired. However, it ceased its significant efforts to establish and sustain a short-haul rail service in Melbourne.

At this time the Victorian Government had a rail mode share target of 30% by 2010 for port freight, a target it later abandoned.

In its 'post-mortem' presentation to the Committee for Economic Development of Australia (CEDA), CRT stated the reasons its service was ultimately not competitive were:

- Inadequate infrastructure
- The need to visit multiple port terminals in one port visit

- No on-dock terminals
- Lack of passing loops
- High handling costs at port compared to road
- Low utilisation
- Import utilisation was 42% and export utilisation was 58% in 2004-05.

### CRT called for four initiatives:

- Single driver operation
- Permitted use of longer trains
- Operating model where stevedores proactively push freight out to inland hubs
- Operating subsidies

## CASE STUDY: DECREASING INTERMODAL RAIL COST AT PORTS

Ports nationally recognise the importance of rail in terms of an efficient supply-chain, expanding freight catchment areas, and delivering environmental and infrastructure resilience benefits. This section details the different ways ports have plan to decrease impediments to rail mode shift.

### Port Botany

Port Botany has capped rail handling costs since the introduction of the Port Botany Landside Improvement Scheme (PBLIS) which came into force in 2010. This scheme enables the NSW Government to impose standards and pricing. Through this mechanism, rail handling costs have been held at \$15 per container. This has been the single largest factor in creating a viable and thriving short haul offering in Sydney. Port Botany also mandates minimum rail terminal handling windows, lifts per hour and open access terminals.

Port Botany has recently invested in on-port rail terminal developments. NSW Ports together with Patrick Terminals have invested \$190 million in an on-dock automated gantry rail terminal.

### Port of Fremantle

The Port of Fremantle introduced a rail handling subsidy in 2006 in the form of a \$50 per Twenty Equipment Unit (TEU) handling cost rebate. The subsidy applies to containers loaded or unloaded at the Forrestfield Intermodal Terminal, the North Quay Rail Terminal, and the Kwinana

Intermodal Terminal.

### Port of Melbourne

The Victorian Government has funded a rail subsidy scheme called the Mode Shift Incentive Scheme for the nine years to June 2022. Four Victorian based rail service operators currently benefit from the scheme.

The Port of Melbourne has also embarked on a significant structural change to rail cost and efficiency in the shape of its Rail Transformation Project (RTP). Once initiated, the RTP aims to improve the economics of rail, in particular short haul rail. The RTP involves significant redevelopment of the on-port rail terminals including changes which will eradicate the current road movement between on-port terminals and container terminals. In addition, these rail terminals will operate off a low fixed-cost base due to subsidised infrastructure, where reduced costs are expected to be passed on to rail users.

### Port of Brisbane

The Port of Brisbane does not have any active subsidies, however they have invested in loading and unloading facilities for coal, grain and intermodal freight. The Brisbane Multimodal Terminal (BMT) is an open access terminal, however currently only 2% of containerised freight in and out of the Port is on rail.

# Train speed

**Severity of impediment: Medium**

**Ability to change/influence: Medium**

**Relevance: Interstate and Regional Rail**

When does the average running speed of a train service matter? When is a slow track speed a significant impediment?

Speed of delivery is important in the freight sector, however the extent of its importance depends on the freight type. Time of delivery in line with customer expectations is just as important, ensuring customers' expectations are met.

Speed issues for freight trains are most important when they can minimise train cycle times and the ability to maximise the number of return journeys over a daily, weekly or monthly period. Reduced journey and cycle times will reduce crew costs and provide benefits to overall rolling stock utilisation. Track speeds are generally regulated in line with track quality and condition, resulting in regional networks running at lower speeds and axle loads when compared to major freight corridors.

It can be the case that freight trains sharing track with passenger services may be required to have a minimum speed (accelerating and

braking) performance. Track speeds in a mixed passenger/freight network may be mandated so that freight trains can achieve equivalent acceleration and speed to passenger services to maximise pathways and increase access opportunities for freight.

As identified, often freight that lends itself to rail is not the most time critical, although short haul rail in Port Botany, for example, has demonstrated that rail can move time sensitive freight and compete with road in terms of timely delivery.

In terms of impediments, track speed may only be viewed as a critical impediment when it enables an additional movement or cycle of a train consist. For example, with Inland Rail, a sub-24-hour journey means that a regular schedule can be adhered to and higher utilisation of equipment achieved. This cycle-time rationale was also one reason behind the recent upgrade and standardisation of the North West Victorian broad-gauge line catering for rail services between the Port of Melbourne and Mildura.

Therefore, permitted track speed can be viewed as an impediment, in particular, in circumstances where it enables more train trip cycles to be achieved within a given period.



# Axel load and double stacking

**Severity of impediment: Medium**

**Ability to change/influence: Medium**

**Relevance: Interstate, Regional and Short-Haul Rail**

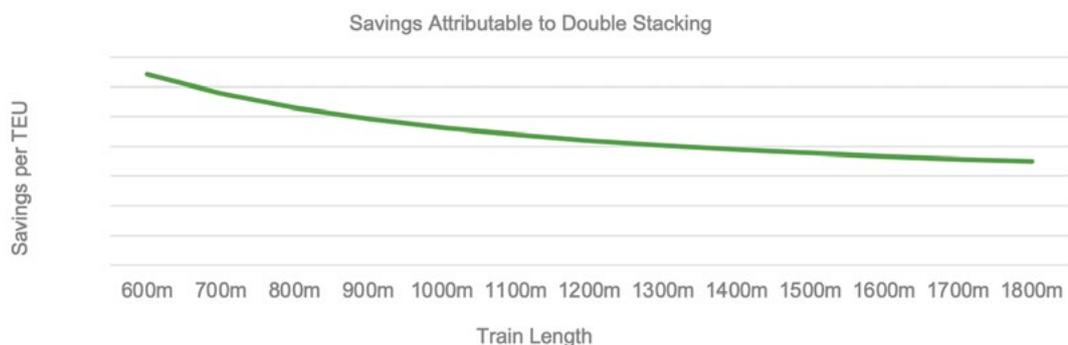
We know that moving higher mass freight over longer distances is the key strength of rail, therefore it makes sense to play to these strengths.

Increasing permitted axle weights means rail can move more with less. Combining high axle limits (>21t) with increases in height clearance can enable the double stacking of intermodal containers which is a significant productivity step change.

Being able to potentially move up to 6 TEU on a wagon usually capable of only moving 3 TEU, for example, represents a significant productivity increase, provided that axle weights are adequate, i.e. at least over 21 tonnes. Additional locomotives may be required however the opportunity to double stack means that loads can be maximised in relation to locomotive pulling capacity.

**What this is telling us: Firstly, this tells us that rail savings attributable to double stacking have a material impact on cost savings vs road. In addition, this tells us that the greatest effect on a per TEU basis is seen in 'shorter' trains as the fixed costs are proportionally higher in these consists so fixed cost dilution effects are higher on a per-TEU basis.**

**Figure 12: Savings related to double stacking as a function of train length**



# Freight volume

**Severity of impediment:** High

**Ability to change/influence:** Medium

**Relevance:** Interstate, Regional and Short-Haul Rail

How much freight is required to run a viable rail service? What factors affect a rail services ability to capture market share? What are the impediments to adequate volume capture?

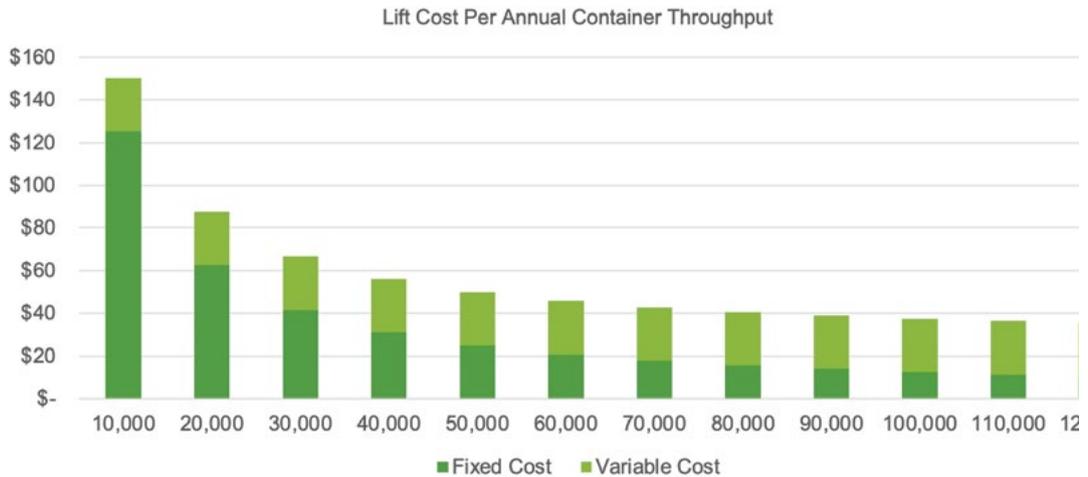
In terms of rail service viability, freight volume has the largest impact, in terms of economies of scale, at freight terminals and reducing handling costs. Beyond a certain point volume does not reduce direct service rail costs.

For example if you have enough volume to fully utilise a rail consist and already use it for the maximum possible cycles per period then that service is as cost efficient as it will ever be (reaching long run marginal cost). However, the more volume that can be put through rail terminals the lower the unit cost will become due to the effect which fixed cost dilution has on infrastructure costs.

In terms of how much volume is needed to run a viable rail service, the answer is relative to other variables however essentially it is the volume that enables a service to get to its long run marginal cost, whereby adding one more unit of freight would not amount to a decrease in cost.



**Figure 13: Required fixed and variable cost recovery at a reference intermodal terminal**



Note: the above is based on a hypothetical reference rail terminal with a capital development cost of \$20M

### Volumes required to approach long run marginal cost for reference rail terminal

Above is a table showing freight volumes in shipping containers (similar logic applies to bulk) which would enable a rail service to approach its long run marginal cost.

The fixed costs of terminal development and handling equipment for trains is substantially greater than that of road transport. Terminal development requires long term investment to fund rail track, hardstands, administration buildings and handling equipment. Hardstands need to align to train length (loading/unloading interface) and are often required to be more extensive than that used for loading/unloading trucks. Trains utilise multiple handling equipment units (forklifts and reach stackers or gantry cranes) to minimise train unload/load times.

Handling costs at rail terminals are also impacted by customer pickup and delivery demands causing rail terminal operators to load/unload trucks whilst servicing a train. This further increases handling equipment requirements.

The cost of freight handling equipment for rail is dependent on the commitment period of investment and the volume of throughput at terminals. Larger volume terminals with throughput over 250-300,000 TEU per annum may be in a position to invest in larger rail-mounted or rubber-tired gantry equipment which increases speed per lift and the capacity of the rail terminal. Gantry operations also enable the opportunity for automation.

Only once higher volumes are achieved can the larger gantries provide adequate returns in both the efficiency of movement and speed of transfer to relevant storage stacks or road transport.

In terms of impediments to rail freight mode shift, aside from factors that affect rail cost vs competing modes, the below have been identified:

- Proximity of freight to rail interface infrastructure, ie rail loading/unloading facilities.
- Access (open access or otherwise) to rail loading/unloading facilities.
- Access to reliable and consistent rail freight services

# Service levels and competition

**Severity of impediment:** High

**Ability to change/influence:** Medium

**Relevance:** Interstate, Regional and Short-Haul Rail



## What impediments exist that hinder rail from achieving competitive service levels?

In a recent exercise conducted by the Queensland Transport and Logistics Council (QTLIC) potential rail freight customers were asked what they wanted; here is what they said:

- **Price:** is the top priority
- **Reliability:** operators can't guarantee the reliability
- **Capacity:** priority customers have adequate capacity. Smaller customer requirements need further investigation
- **Frequency:** more frequent trains preferred
- **Speed:** a faster service makes very little difference
- **Visibility:** opaque information provided by exception
- **Communication:** could be improved
- **Less stoppages:** less unplanned maintenance and track occupations

When any of these factors are not achieved this represents an impediment to rail mode shift. Ultimately rail needs to deliver the required and expected services levels of the customer. This may be an impediment as if rail cannot deliver competitive service levels either as a standalone line haul service or as part of a multi-modal integrated transport offering then it will struggle to gain mode share.

## Can short haul rail compete on service levels?

There is evidence to show that under certain conditions rail can provide a higher level of service than road even over shorter distances. For example, NSW Ports have completed analysis showing that imports utilising rail can reach their unpack destination faster by rail.

If there is a timely and efficient transfer from vessel to rail (and again at the unloading end) then there is no reason that rail cannot compete with road in terms of service levels. Supply-chains need to be integrated and coordinated. A subject discussed more in other sections.

# Market barriers

**Severity of impediment: Medium**

**Ability to change/influence: Low**

**Relevance: Interstate, Regional and Short-Haul Rail**

In terms of barriers to market entry, it is true that there are significant knowledge, investment, and in some case actual regulatory market barriers to entry for new rail operators or network owners/ investors however there is limited evidence to suggest that a lack of market actors is a major impediment to mode share growth.

An increased number of market actors is often preferred so that there is competitive tension, downward pressure on prices and greater motivation to innovate and increase productivity. A lot of this competitive pressure in the rail sector is from other modes, therefore as long as this tension exists there are less concerns related to the number of market actors possibly leading to high prices.

This being said, a potential barrier to market entry does relate to the complexity of rail versus road. If you would like to establish a new rail operation, and in particular new rail infrastructure, the pathway to do this is protracted and complex. For example, gaining the required approvals and consents to develop and connect a new rail terminal, or alter exiting connections is a protracted and expensive task.

This is exemplified by the long lead times for new rail interface developments such as SCT Altona, Salta Properties in Altona and Dandenong South, Austrak in Somerton, InterlinkSQ in Toowoomba and many more. Gaining physical and operational access to rail is complex, timely and expensive. These market entry and expansion challenges appear to serve as very real barriers to rail growth.

# Commercial

**Severity of impediment: Medium**

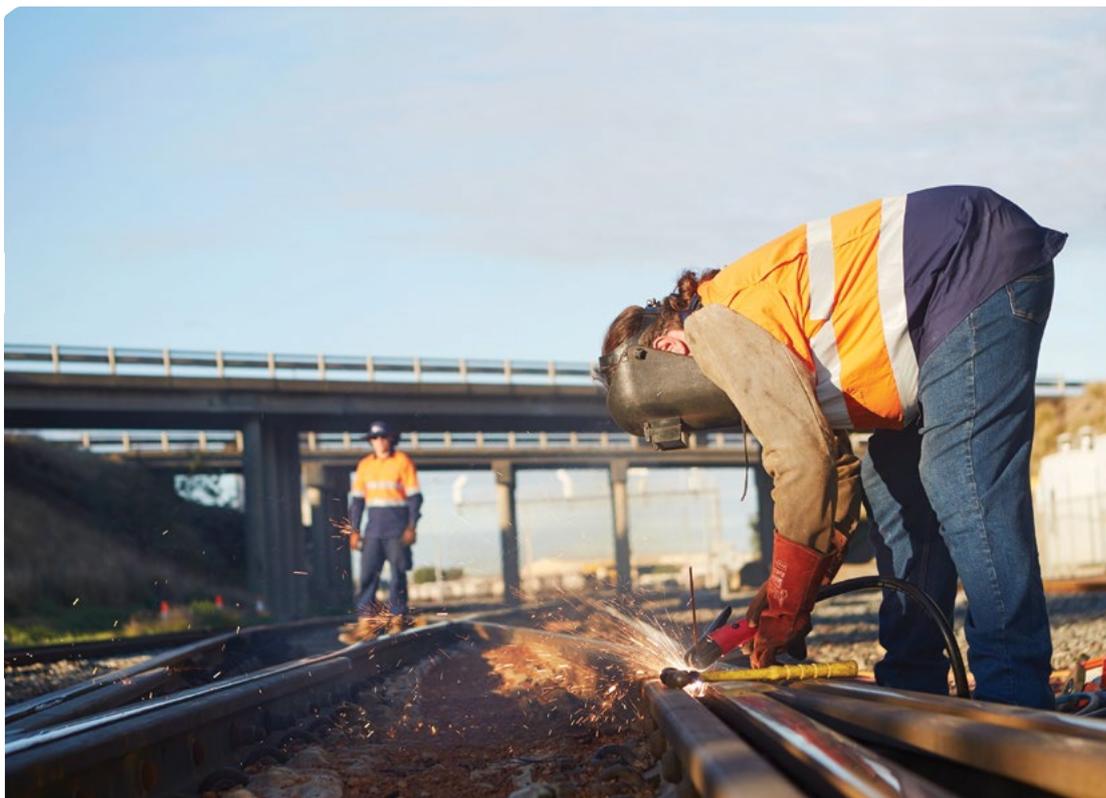
**Ability to change/influence: High**

**Relevance: Interstate, Regional and Short-Haul Rail**

Alignment of long-term (20-30 year) investment requirements for rail infrastructure and rolling stock with likely commercial contracts of 3-5 year terms creates a contract commitment asymmetry for rail operators, increasing overall investment risk as compared to investing in road operations.

Overall rail investment cycles are based on 20-30 year outcomes compared to road on a 7-10 year cycle. While this can provide benefits in the longer term the up-front investment requirements can impact direct cost and competitiveness.

The opportunity exists to look at ways to bridge this asymmetry of obligation and commitment on behalf of those willing to invest in and grow rail.



# Available freight type

**Severity of impediment: Medium**

**Ability to change/influence: Medium**

**Relevance: Interstate, Regional and Short-Haul Rail**

What type of freight is conducive to adding in an increased modal shift? What role can rail play in these seemingly less-conducive freight types?

As discussed, rail works best with heavy freight travelling longer distances, however what other freight should rail services be attracting? Below are some freight attributes that lend themselves to rail;

- Consistent volume: rail largely has fixed capacity so predictable freight volumes are more conducive.
- Potentially less time-critical freight: to maximise train utilisation freight may need to be accumulated, this means trains will not be as frequent as required.
- Two-way loading: This is important for road and rail however it is more pronounced with rail as often services are shuttles moving between the same origin and destination.
- Large point-to-point movements: When freight origins and destinations are consistent, i.e. with imports/exports the freight is generally generated in the same origin and requires delivery to the same location (ie Ports).
- Low carbon emitting supply-chains: Rail also lends itself to users who value more sustainable and less greenhouse gas emitting supply-chains. Some rail users have preference rail over road due to their own sustainability and decarbonisation objectives.



# Compliance, regulation, labour and infrastructure costs

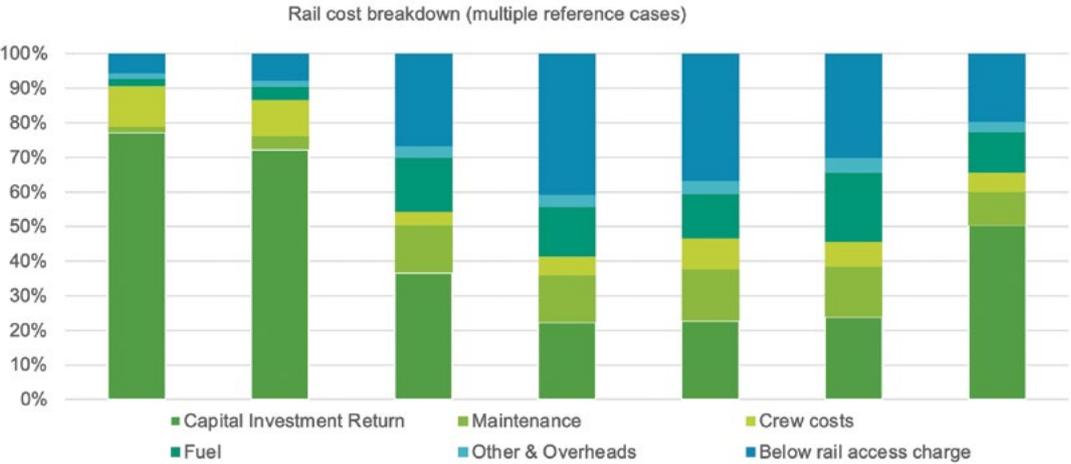
**Severity of impediment:** High  
**Ability to change/influence:** Medium  
**Relevance:** Interstate, Regional and Short-Haul Rail

Does rail pay a disproportionate amount of infrastructure costs compared to road? Do rail access fee's outweigh road user charges to the detriment of rail? Are labour costs disproportionately higher for rail?

Rail network access charges are based on a flag fall for accessing the network and a variable tonne-kilometre charge. Road transport has a similar fixed and variable charge, whereby variable charges relate largely to fuel excise charges.

To compare relative costs, we have selected seven real world rail reference cases and compared the respective cost components for each. The reference cases have been anonymised.

**Figure 14: Rail cost breakdown based on seven reference cases**



### Rail Reference Cases

Reference cases include a mix of metropolitan short-haul services, long haul services and mid-distance regional trains.

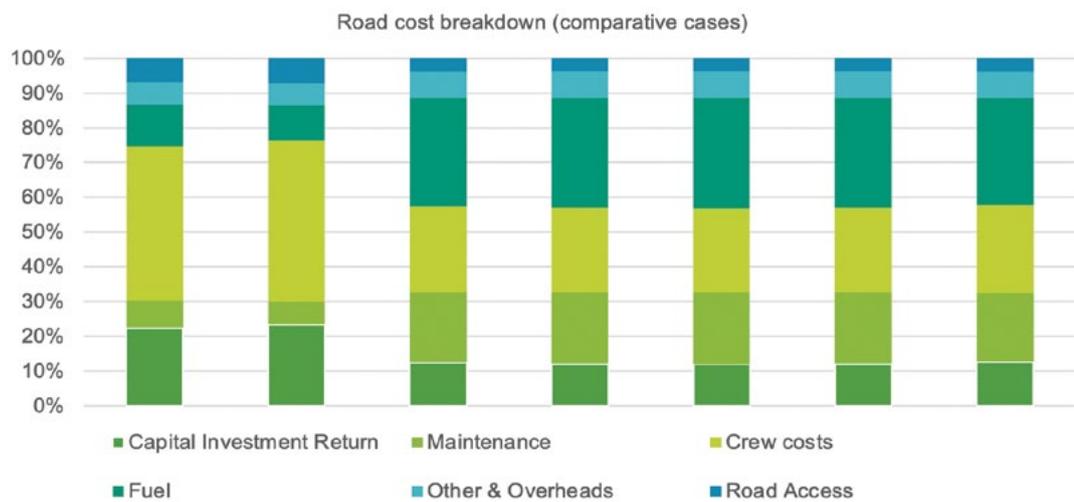
*Note: The above does not include the impact of operational subsidies which exist in a few of the above reference cases to offset rail access charges.*

## Road Comparison

The below shows the relative cost for road services against the same journey-types as in Figure 14.

*Note: A percentage of fuel costs are fuel excise charges which may also be allocated to the Road Access component.*

**Figure 15: Road cost breakdown based on comparative reference cases**



**What this is telling us: A fair like for like comparison regarding costs associated to infrastructure access is complicated due myriad on taxes, subsidies and rebates however road access costs appear significantly less than rail access costs<sup>8</sup>. The required return on capital investment is also significantly lower for road however labour costs are higher.**

### Labour

It is widely acknowledged that train drivers are largely paid more than truck drivers, however there are certainly proportionately more truck drivers per tonne/kilometre of road freight so how significant are labour costs in terms of rail freight viability?

Labour costs between road and rail become vastly different over longer distances and larger volumes of freight. Labour does not only impact cost, labour arrangements can also

affect operational efficiency. For example, if you are required to stop your service for crew change overs vs. having a crew sleeper car this can affect your service viability. Drivers and crew are not just being paid when trains are moving. Labour costs continue to be incurred when trains are being unloaded/loaded and also when crew are away from home. Longer distance services require crew relocations and accommodation which can be expensive and add to the higher fixed-cost nature of rail.

Autonomous trains are being used in mining and metro-style services. This is not seen as having a large impact on rail service costs but more related to train service levels and schedules being more flexible and dynamic. The road sector will likely see similar advances in this area so automating crew functions are not seen as a significant game changer with regard to mode shift.

<sup>8</sup> A portion of fuel costs consist of taxes so these could be appropriated to the infrastructure access component however in doing so tax rebates and incentives would also need to be considered.

# Multiple rail gauges

**Severity of impediment: Medium**

**Ability to change/influence: Medium**

**Relevance: Interstate, Regional and Short-Haul Rail**

Most States have two separate rail gauge networks (some have three), how much of an impediment is this, what is it preventing us from doing?

The interstate network is standard gauge however narrow gauge and broad-gauge rail also exists in Queensland, Tasmania, Western Australia, and Victoria respectively. Some state network lines are being standardised or dual-tracked however this is not part of a concerted program. Essentially the use of different gauges means there are potentially less operators in particular markets and higher barriers to entry. There is also additional cost related to break of gauge, where freight must be transferred from one train to another. An example of this is the BlueScope train from Kembla to Hastings whereby steel coils are moved from a standard gauge train to a broad-gauge train in Melbourne.

Different gauges mean there is less operational flexibility and less choice. The long-planned Port Rail Shuttle Network (PRSN) in Melbourne will operate on broad gauge in the South East and likely standard gauge in

the North and West. This means shuttle trains cannot be allocated dynamically to where they are needed on a particular day affecting train utilisation and service levels.

The occurrence of multiple gauges provides challenges for rail operators who need to make decisions regarding the best allocation of rolling stock given the lack of a standardised rail network. Essentially, they must decide how they invest and service customers on lesser used gauges. They are more likely to invest and focus on the standard gauge network where rolling stock utilisation can achieve higher levels and increased axle loads support better returns and flexibility. They are unlikely to invest in new efficient equipment on reducing alternative gauges with a need for 20-30 years return.

For example, in Victoria reducing use of broad gauge track results in few rail service providers and as increasing tracks are converted to standard gauge this issue may be exacerbated. Rolling stock can (at cost) be converted between gauges, in fact rail operators are buying convertible locomotives in particular to help future proof their investment.

# Rail freight line infrastructure

**Severity of impediment: Medium**  
**Ability to change/influence: High**  
**Relevance: Regional and Short-Haul Rail**

In suburban areas the need for separation of freight and passenger trains by building dedicated freight lines is an ongoing area or focus for State and Federal Governments.

As rail corridors can be narrow or restricted in some areas the opportunities for this to easily be achieved few. In busy metropolitan corridors rail freight can only operate within defined non-curfewed periods.

Network access curfew periods mean that trains cannot achieve their ideal cycles per period or align to downstream supply-chains

as needed. Train cycle times between terminal locations for rail port shuttles are critical as mixed networks may restrict access to only two or three train cycles per day. If this is then further impacted increased passenger services a reduction of train cycles to two per day creates a potential 33% drop in rolling stock utilisation and increased costs applied to the remaining services.

Where passenger trains share the same network as freight services the practice of giving passenger services priority reduces freight service performance and reliability further. As passenger priority is often mandated a 'health' on-time freight train may be forced to wait for an 'unhealthy' or off-window passenger service. The impact of passenger priority is high and guaranteed access windows are critical.



# Road productivity

**Severity of impediment: High**

**Ability to change/influence: Low**

**Relevance: Interstate, Regional and Short-Haul Rail**

## What effect do higher productivity trucks have on the viability of rail?

Road has benefited from significant leaps in productivity over the years from the introduction of the b-double to opening up many freight routes to High Productivity Freight Vehicles (HPFV's). Road has been able to double its productivity in the last few decades as longer heavier trucks have been permitted on Australian roads. Relative productivity increases have not been possible for rail. The only comparable increase is the ability to double stack trains on the East-West line and soon to be possible on the Inland Rail North-South corridor.

In terms of road productivity continuing to impact rail mode shift, this will continue to be a risk, however the use of HPFV's is stabilising and the wide-spread rollout of vehicles capable of carrying more than four TEU or over 36.5m Super A/B Double is not currently on the horizon. The next increase in road productivity is likely to be platooning and/or autonomous vehicles. Similar technology advancements should benefit rail in terms of autonomous trains and more efficient pathing.

It is also possible that low or no emission vehicles will narrow rail's low emission advantage, however similar advances in alternative fuels for locomotives should counter this adequately. A fact that should give the rail industry comfort is that no matter the future sources of energy, in relative terms it remains

true that due to the lower coefficient of friction between steel wheels and rail versus rubber tires and tarmac, rail requires less energy to move freight on a per tonne basis. This is an advantage that should endure.

In terms of the impact on rail infrastructure, the advancements in road productivity can affect rail's competitiveness for moving traditionally secure commodities such as grain where many regional rail networks have been maintained to a minimum standard during drought or lower volume years and upgrade costs are compared unfavourably to a road based outcome. The Eyre Peninsula in South Australia is an example where the network was maintained at a low axle load and subsequent road vehicle capacities have led to a closure of rail and all movements on road.

Increases in road productivity does impact rail competitive position however efficiency gains in other modes should be countered by productivity gains in rail. Rail has multiple opportunities to increase productivity, including but not limited to:

- Double stacking
- Increase axle loads
- Longer trains
- Single driver operations
- Interoperability between networks
- Advanced Train Management Systems
- Dynamic scheduling

# Coastal shipping by international vessels

Coastal shipping is a beneficial and valuable means of moving freight between our ports. As a consequence of one-way international vessel east-west calling patterns this has led to less balanced (two-way) freight loads available for rail.

## Economic Assessment and Infrastructure Funding

Are positive externalities associated to rail adequately captured in Business Cases and funding decisions? Does this affect the level of funding rail receives?

Positive externalities largely include carbon emissions, safety, health benefits, and reduced road wear.

These externalities are discussed in detail in the ARA commissioned 'Value of Rail' report generated annually by Deloitte Access Economics (DEA).

Rail accounts for over half of land-based freight transport, playing a very large role in the movement of goods around Australia. In 2017-18, road freight generated 32 million tonnes of CO<sub>2</sub> equivalent emission while rail generated only 4 million tonnes in 2015-16. Even though road moves less goods, road freight generated almost nine times as much CO<sub>2</sub> equivalent emission as rail freight<sup>10</sup>.

### Carbon emissions of freight movements

	Total emissions (million tonne of CO <sub>2</sub> equivalent)	Total distance travelled (billion tonne km)	Emissions/tonne km travelled (Kilograms of CO <sub>2</sub> equivalent per tonne km)
<i>Road in 2017-18</i>			
Light commercial vehicles	11.3	5.4	2.07
Rigid trucks	8.4	39.0	0.22
Articulated trucks	12.3	175.6	0.07
<b>Total road</b>	<b>31.9</b>	<b>220.1</b>	<b>0.15</b>
<i>Rail in 2015-16<sup>(a)</sup></i>			
<b>Total rail</b>	<b>3.6<sup>(b)</sup></b>	<b>413.5</b>	<b>0.01</b>
<b>Difference</b>			<b>0.14</b>

Notes: (a) Estimate includes emission from power generation for electric rail. (b) Sum of electric and non-electric. Source: Deloitte Access Economics estimates using BITRE (2006 and 2019)

<sup>10</sup> Deloitte Access Economics - Value of Rail Report 2020

In terms of safety benefits DAE estimates that estimates that freight road accidents make up around \$1.8 million in costs. 62 While the socio-economic costs of freight rail accidents are estimated to be \$43 million in 1999 (in 1998-99 prices)<sup>11</sup>.

Road accident costs are twenty times higher than rail for every tonne kilometre of freight moved. In terms of health benefits, DAE calculated that Rail freight generates 92 per cent less PM10<sup>12</sup> than road freight for each tonne kilometre of freight moved.

Unit	Road	Rail
<b>Total cost (\$ million)<sup>(a)</sup></b>	<b>\$1,785</b>	<b>\$43</b>
<b>Passenger task (billion tonne km)<sup>(a)</sup></b>	<b>173</b>	<b>106</b>
<b>Crash cost (cents per tonne km, in original prices)<sup>(b)</sup></b>	<b>1.0</b>	<b>0.04</b>
<b>Crash cost (cents per tonne km, in 2019 prices)</b>	<b>1.4</b>	<b>0.1</b>
<b>Avoided crash costs from using rail instead of road (cents per tonne km)</b>		<b>1.3</b>
<b>Total crash costs (\$ million, latest date)<sup>(c)</sup></b>	<b>\$3,030</b>	<b>\$282</b>

Note: (a) Values refer to 2005-06 for road and 1998-99 for rail, (b) These figures are expressed in 2005-06 prices for road and 1989-99 prices for rail, (c) Values refer 2017-18 for road and 2015-16 for rail.

Source: Deloitte Access Economics calculations based on BITRE (2009b) and BTRE (2002).

## Externalities and Modal Shift

DAE concludes that a 1% modal shift equates to \$71.9 million in externalities. Total benefits described above amount to \$71.9 million for a 1% modal shift from these three forms of social costs. It is important to note that these are not the only costs that derive from a shift from road to rail, such as benefits associated with reduced degradation of roads. Therefore, this is only an indicative estimate and the true benefit could be different. The below totals the safety, emissions and health costs above per tkm between the major cities.

The extent to which these externalities are considered adequately in business cases depends on the standards applied to each evaluation however mostly externalities of rail are included and do contribute to Benefit-Cost Ratios (BCR) and Government funding decisions.

An option for ARA members consideration and potential future investigation is whether rail alternatives are adequately considered in road projects. We know that externalities do account for rail project BCR's but whether they are adequately accounted for in modal investment decisions is a matter that requires clarification.

## Example of reduced safety, emissions and health costs for intercity freight moved by rail instead of road per tkm, in 2019 prices

Total costs saved (\$)	Sydney	Melbourne	Brisbane
<b>Melbourne</b>		<b>\$30.20</b>	
<b>Brisbane</b>		<b>\$31.37</b>	<b>\$61.80</b>
<b>Perth</b>	<b>\$134.49</b>		<b>\$112.74</b>
			<b>\$165.83</b>

11 This is calculated as 30% of the total \$143 million in 1999 (in 1998-99 prices) of socio-economic costs from rail accidents, per Bureau of Transport, Infrastructure and Regional Economics (BITRE) 2002, Rail accident costs in Australia, Report 108, Canberra ACT, available at: [https://bitre.gov.au/publications/2003/report\\_108.aspx](https://bitre.gov.au/publications/2003/report_108.aspx). This percentage assumption was used per Laird, P. 2005, Revised Land Freight External Costs in Australia, Paper presented to the 28th Australasian Transport Research Forum, Sydney.

12 PM10 is a measure of noxious emissions



# 5.

## Impediment summary & **recommended actions**



Mode Shift Impediment	Nature of Impediment	Opportunity
<p><b>Distance is an impediment to mode shift</b></p> <p><i>Relevance: Interstate, Regional and Short-Haul Rail</i></p>	<p>Rail is less competitive with other modes over shorter distances, however it has been demonstrated through sensitivity analysis that other factors, if optimized, can counter the viability challenges of shorter haul trips.</p> <p>For example, analysis indicated that in a specific reference case based on an 1800m train an increase in train utilisation of 30% resulted in the viable distance reducing by 50km.</p> <p>Potentially the most impactful way for rail to be competitive across shorter distances is to increase the number of train round trips to 'cycles' per 24-hour period. As mentioned, productivity is all about keeping your train moving regardless of the journey distance.</p>	<p>Distance does matter but the challenges are certainly not insurmountable, there is no 'hard rule' regarding viable rail distance.</p> <p>Actions and policies supporting increases in productivity or lowering costs in the below areas should be actively pursued;</p> <p>Productivity enhancements which lower the impediments to rail mode shift related to shorter journey distances.</p> <ul style="list-style-type: none"> <li>• Train cycles per 24hr period<sup>13</sup></li> <li>• Train utilisation (how many of your wagons are carrying payloads)</li> <li>• Train travel time (high average speed and minimal delays)</li> <li>• Turnaround time at terminals</li> </ul>
<p><b>Rail is only cost competitive when high utilisation is achieved</b></p> <p><i>Relevance: Interstate, Regional and Short-Haul Rail</i></p>	<p>High utilisation<sup>14</sup> is very important to rail viability. To be achieved, trains need access to significant freight catchment areas. Last mile costs need to be minimised to increase access to freight, and backloading opportunities identified where possible.</p>	<p>Minimising handling and last mile costs will increase freight catchment and therefore utilisation. Initiatives and interventions that minimise handling and last mile costs should be supported.</p>
<p><b>High rail terminal infrastructure and handling costs impact rail's cost competitiveness</b></p> <p><i>Relevance: Interstate, Regional and Short-Haul Rail</i></p>	<p>Higher freight loading/unloading costs as compared to road likely affect mode shift. Rail terminal costs, in particular handling costs at Ports have been identified as impediments to rail competitiveness.</p>	<p>Rail does generally incur higher costs than road at port terminals however many ports have, or are, addressing this issue so this impediment should diminish over time. ARA should support initiatives which reduce handling costs.</p>

<sup>13</sup> Train cycles means round trips. The significance of 24 hours is that a regular schedule can be maintained if cycles are contained within a 24-hour period.

<sup>14</sup> Percentage of loaded wagons per round trip.

Mode Shift Impediment	Nature of Impediment	Opportunity
<p><b>Last mile costs associated with rail impact competitiveness vs. other modes</b></p> <p><i>Relevance: Interstate, Regional and Short-Haul Rail</i></p>	<p>Last mile costs can have a significant impact on rail viability. Costs can be reduced by locating intermodal terminals near rail users and supporting developments which allow for co-location of complementary services.</p>	<p>Support development of rail terminals near rail users and those which create co-location opportunities. Key to this is encouraging and supporting improved land use planning and protection of land for rail facilities and rail-related services.</p>
<p><b>Do train length limitations impede rail mode shift</b></p> <p><i>Relevance: Interstate and Regional</i></p>	<p>Restricted train lengths can impact viability however the benefit has a decreasing marginal saving as trains increase in length. Short haul services are suited to shorter more frequent services, therefore this is not viewed as a high priority impediment.</p>	<p>Support the addition of passing loops and more accommodating terminal infrastructure which enables longer trains.</p>
<p><b>Track speed limitations and longer unload/load times lead to increased journey times as compared to road</b></p> <p><i>Relevance: Interstate, Regional and Short-Haul Rail</i></p>	<p>Travel times can have a high impact on rail viability if they limit productivity, and in particular prevent additional cycle/trips per day. Rail unloading/loading times can also impact rolling stock productivity.</p>	<p>Rail corridors and journeys should be identified where faster track running times and load/unload speeds would enable additional train cycles and higher productivity. Corresponding infrastructure upgrades and operational advancements should be supported.</p>
<p><b>Track axle load limitations impede rail viability</b></p> <p><i>Relevance: Interstate and Regional</i></p>	<p>Track axle loads can be a significant impediment if it can be demonstrated that greater payloads will increase productivity (move more with the same equipment).</p>	<p>Specific opportunities to increase axle loads should be identified and associated upgrades supported.</p>

Mode Shift Impediment	Nature of Impediment	Opportunity
<p><b>Rail needs access to high freight volumes to be viable</b></p> <p><i>Relevance: Short-Haul, Interstate and Regional</i></p>	<p>Rail does, in most instances, need access to significant freight volumes to be viable. High throughput is particularly important for freight terminals. Rail services and freight terminals may require financial assistance whilst they are growing volumes in the early growth stages. Such assistance can lower handling costs in the start-up phase and increase access to freight.</p>	<p>It should be acknowledged by Government that due to the high level of financial commitment and the need for a multiple-year ramp-up period wherein new rail services and freight terminals likely require financial assistance in the early years. ARA can advocate for a funding framework to give clarity to the private sector in terms of this support.</p>
<p><b>Required levels of service may impede rail mode shift</b></p> <p><i>Relevance: Interstate, Regional and Short-Haul Rail</i></p>	<p>Reliability, frequency, visibility, and speed are all service levels required by rail customers. Rail may struggle to compete at times with roads ability to be flexible and timely, however it has been demonstrated that rail can compete given the right infrastructure and operational processes.</p>	<p>Define the requirements of rail to successfully compete with service levels of other modes and consider showcasing the Port Botany rail case study, as detailed in this report, and others, as a real-world examples to be followed.</p>
<p><b>Gains in road productivity have created increased impediments to mode shift</b></p> <p><i>Relevance: Interstate, Regional and Short-Haul Rail</i></p>	<p>As road incrementally increases in productivity the viability threshold of rail shifts, however rail also has opportunities to increase productivity.</p>	<p>Productivity advances should be further defined including;</p> <ul style="list-style-type: none"> <li>• Double stacking</li> <li>• Increase axle loads</li> <li>• Longer trains</li> <li>• Single driver operations</li> <li>• Interoperability between networks.</li> <li>• Advanced Train Management Systems</li> <li>• Dynamic scheduling</li> </ul>

Mode Shift Impediment	Nature of Impediment	Opportunity
<p><b>Client vs investment commitment asymmetry is an issue impacting mode shift</b></p> <p><i>Relevance: Interstate, Regional and Short-Haul Rail</i></p>	<p>Rail investments are for 20-30-year horizons whereas customers may only commit for 2-3 years. Road alternatives benefit from better commitment symmetry due to lower investment requirements and access to leased equipment.</p>	<p>Lease options are available for rail locomotives and rolling stock however track and terminal infrastructure still requires long term investment commitment. ARA may consider encouraging Government funding assistance that will give investors more confidence to commit long term.</p>
<p><b>Last mile road move costs impede rails viability</b></p> <p><i>Relevance: Short-Haul, Interstate and Regional</i></p>	<p>It is true that last mile costs can impede competitiveness and decrease freight catchment areas therefore the need for freight terminals to be close to rail users and for new developments to enable co-location of complementary services such as empty container parks is essential.</p>	<p>Support improved land-use planning to support the development of new freight terminals and the protecting of land buffers around exiting rail terminals.</p>
<p><b>Barriers to entry exist which may impede rail market efficiency</b></p> <p><i>Relevance: Interstate, Regional and Short-Haul Rail</i></p>	<p>Developing rail interface infrastructure (freight terminals) and gaining physical access to rail networks is complex, protracted, and outcomes are uncertain. In comparison gaining access to road networks is straightforward and low risk.</p>	<p>Rail network owners need to be encouraged to develop clear interface infrastructure development and access guidelines which will give those looking to invest in rail infrastructure and gain access to rail networks clarity and confidence to invest.</p>
<p><b>Transport modes face disparity in terms of regulatory and compliance costs</b></p> <p><i>Relevance: Interstate, Regional and Short-Haul Rail</i></p>	<p>A more concentrated risk profile leads to higher regulation and associated compliance costs which are diluted among fewer parties when compared to road.</p>	<p>Regulatory and compliance costs should be quantified and compared with other modes using a transparent and equitable comparison method. Any inequity should be addressed.</p>

Mode Shift Impediment	Nature of Impediment	Opportunity
<p><b>Passenger rail services have network access priority regardless of freight rails adherence to scheduled paths</b></p> <p><i>Relevance: Interstate, Regional and Short-Haul Rail</i></p>	<p>Passenger priority on shared passenger/freight networks can impact freight train running times and reliability which adversely affects rails value proposition.</p>	<p>Priority for passenger services is an engrained policy in most networks however Covid has seen a relaxing of this stance<sup>14</sup> and this trend should be encouraged to continue.</p>
<p><b>Government investment evaluation methods may not fully reflect the environmental, social, and economic benefits of rail</b></p> <p><i>Relevance: Interstate, Regional and Short-Haul Rail</i></p>	<p>The benefits of rail may be under-represented in Government investment decisions.</p>	<p>The way rail is assessed in terms of environmental, economic, and social benefits should be reviewed and recommendations made to Infrastructure Australia and other agencies who assess rail investments.</p>
<p><b>Rail may struggle to compete with coastal shipping due to low marginal cost of shipping services</b></p> <p><i>Relevance: Interstate Rail</i></p>	<p>The marginal costs of adding an extra coastal shipping container to an international shipping service is so low rail, and other modes, may be unable to compete. Coastal shipping on international services can also create large freight imbalances and lead to rail not being able to access backloads.</p>	<p>Further investigation of this issue is planned by the Freight on Rail Group (FORG) and the ARA.</p>

<sup>14</sup> NSW suspended passenger service priority rules in 2020 during COVID-19

Mode Shift Impediment	Nature of Impediment	Opportunity
<p><b>Metropolitan track curfews impact freight services which enter or exit metropolitan areas</b></p> <p><i>Relevance: Interstate, Regional and Short-Haul Rail</i></p>	<p>Freight trains are subject to curfews on some metropolitan tracks during peak times due to commuter traffic. The same peaks exist on the road network however the same limitations are not applied to road freight, creating an impediment.</p>	<p>The development of non-restricted dedicated freight lines should be encouraged. Where dedicated freight lines are not an option, other operational advancements which allow better passenger and freight rail service integration should be investigated.</p>
<p><b>Multiple rail gauges impact rail viability</b></p> <p><i>Relevance: Interstate, Regional and Short-Haul Rail</i></p>	<p>Having different gauges of track impacts interoperability of locomotives and rolling stock which decreases flexibility and optimal asset deployment.</p>	<p>Standardisation should be supported where possible.</p>

