



Association Number A03958 | ABN 64 217 302 489

AUSTRALASIAN RAILWAY ASSOCIATION SUBMISSION

To

Transport for NSW

On

Draft Future Transport Strategy 2056



THE ARA

The Australasian Railway Association (ARA) is a not-for-profit member-based association that represents rail throughout Australia and New Zealand. Our members include rail operators, track owners and managers, manufacturers, construction companies and other firms contributing to the rail sector. We contribute to the development of industry and government policies in an effort to ensure Australia's passenger and freight transport systems are well represented and will continue to provide improved services for Australia's growing population.

INTRODUCTION

The ARA welcomes Transport for NSW (TfNSW) consideration to long term future transport and infrastructure planning, and appreciates the opportunity to provide this submission on the Draft Future Transport Strategy 2056.

The ARA's comments are provided against the backdrop of the rail sector's demonstrated contribution to the Australian economy. Research recently undertaken for the ARA by Deloitte¹ found the sector contributes around \$26 billion a year (1.6 per cent of GDP) and over 140,000 jobs.

The Deloitte report also confirmed that with Sydney's population expected to increase by 3 million people by around 2060, government and industry will face significant challenges ensuring the efficient and safe movement of people and freight around the city, and across the state.

Improving the planning of New South Wales (NSW) infrastructure and transport is critical to the state's long-term productivity, efficiency and liveability.

DISCUSSION

The ARA's comments on the Draft Future Transport Strategy reflect the ARA's [National Rail Industry Plan](#) which has been developed to support the rail industry's efforts to achieve its full potential. The following comments also draw on Deloitte Access Economics, [Value of Rail](#),

November 2017 study commissioned by the ARA, and are consistent with the ARAs submission to the Federal Government's inquiry into National Freight and Supply Chain Priorities, and the Federal Government's House of Representatives Standing Committee on Infrastructure, Transport and Cities inquiry into the Governments role in the development of cities.

1. THE ROLE OF RAIL

Rail provides the backbone of public transport system in NSW's and the freight network across the country. Continued improvement of both the passenger and freight rail networks through technology, infrastructure investment and efficiencies will increase the service and capacity offering and position rail as a viable alternative to the car or truck.

Rail's role is becoming more prominent, due to increased intermodal and bulk freight demand, increased population growth, increasing road congestion and costs, as well as environmental and social considerations.

The demand for more freight on rail continues to increase, but is still underutilised. Rail accounts for the majority of inter-capital origin-destination non-bulk freight on the east-west corridor, and approximately 30 per cent market share of non-bulk freight travelling between Brisbane and Melbourne. Bulk interstate haulage in NSW comprised of 14 per cent of the national bulk freight haulage.

Deloitte Access Economics, Value of Rail study published in November 2017² identified that Sydney will grow by approximately 3 million people by around 2060 and noted that the challenge of accommodating this growth is exacerbated by the fact cities can't continue to grow in geographic size forever, this means there will almost certainly be a major increase in the density of Sydney. Projections indicate that with current vehicle technology and ownership trends, the stock of private motor vehicles will grow around 14.8 million today to 28 million by 2050 and travel in motor vehicles by 40 per cent with congestion costs increasing by far more than this. To manage these challenges, NSW will have to continue to significantly develop its transport infrastructure with rail in a central role.

In 2015, private vehicles accounted for 87 per cent of Australia's total passenger transport task in urban areas. Continuing to clog our roads and cities with vehicles will impact Australia's

economic productivity and gross domestic product (GDP)³. The Bureau of Transport, Infrastructure and Regional Economics continue to calculate the cost and impact of road congestion. In 2015, time stuck in traffic in Australian cities cost the Australian economy \$16.5 billion in lost personal and business time, extra vehicle operating costs and additional transport emissions. Business as usual projections put the cost of congestion at \$30 billion in lost productivity by 2030⁴.

Rail is part of the solution. One passenger train takes 800 cars off the road during peak hour, and a freight train takes 110 trucks moving freight. Research shows that building more roads does not reduce congestion, and therefore there is no economic (or social) justification for this approach. In fact, increased road traffic can often be a cause of induced demand as opposed to population growth.

Public transport has broader benefits beyond reducing road congestion. It is proven that public transport is cheaper, safer, and more environmentally responsible and enables older Australians, people with a disability and those in lower socioeconomic situations, to access basic services and reduce their isolation. Australians who travel by public transport are proven to be more active and healthier. Deloitte Access Economics Value for Rail⁵ study identified that rail imposes fewer costs on the community in terms of accidents, congestion and emissions, compared to road, which are not factored into transport prices:

- Each passenger journey made by rail instead of road generates benefits for society of between \$3.88 and \$10.64 by reducing congestion, accident and carbon costs.
- Road freight produces 14 times greater accidents costs than freight per tonne kilometre and 16 times as much carbon pollution as rail freight per tonne kilometre.
- Moving freight by rail instead of road generates benefits for society of around 1.45 cents per tonne kilometre. This means that, if all road freight moving between Sydney and Melbourne travelled by rail, this would generate social benefits of \$111 million a year.
- Based on 2015-16 prices, in switching from a road to rail for each commute (per 15 km) in Sydney would:
 - avoid carbon costs of 4.06 cents;
 - save 27.30 minutes in travel time;
 - avoid generating 2.1kg in CO₂ emissions;

- save \$9.22 in congestion costs; and
- save \$1.38 in accident costs.

The ARA supports the concept of '30 minute' cities, particularly in regard to daily workforce commutes. To maximise an individual's social benefits and ensure quality of life will require further investment to improve public transport services, complimented with demand management.

2. DEMAND MANAGEMENT

Demand management has a role to play in Australian cities. By charging road users to access certain roads or areas of a city, congestion charging reduces road congestion and transport-related emissions by encouraging road users to adopt alternative transport options. These systems generate significant revenue that should at least in part, be re-invested in public transport offerings.

Congestion charging would be challenging to introduce in NSW, as it would be likely to generate significant opposition. However, with strong political will, it could be done. The longevity of the systems around the globe, such as Singapore and Oslo, and the positive results the systems have achieved, are proof that a congestion charge can be a successful tool to improve the transport system of Sydney whilst providing a source of revenue for long term investment.

In its June 2013 National Infrastructure Plan, Infrastructure Australia recommended seven funding reforms, one being "user pays – user says" which made the case for "users to make a direct contribution to infrastructure and in turn, get a say on the level of service provided". Introducing congestion charging within Sydney would not only improve the flow of traffic but also establish significant funds to invest in the transport system.

3. EQUITABLE ROAD RAIL PRICING

The ARA believe there is a need to remove policy bias between transport modes. Levelling the road / rail pricing regime is integral to this.

This issue is also highlighted in ARA's recent Deloitte report, which argues there is scope for ensuring that road usage is charged in a manner that accurately captures the cost of road infrastructure provision and, further, the negative externalities of road usage, such as congestion, vehicle emission and accidents.

It also highlights how the current charging arrangement can lead to poor incentives, resulting in socially undesirable outcomes. For example, trucks may be used on routes where trains would be preferred if trucks were charged for the full costs created by their use of the road network.

Similarly, drivers may choose routes or times of travel that cause congestion for other road users because pricing does not consider the effect of their decisions on others.

Whilst being lead at the national level, the Heavy Vehicle Road Reform process is an endeavour requiring buy-in from all jurisdictions to support its development and implementation. NSW support for this process is critical to addressing the long-standing pricing inequities between road and rail.

More consistent and equitable road and rail infrastructure pricing is needed, and the final Future Transport Strategy 2056 should address road usage pricing for heavy vehicles.

4. SEPARATION OF PASSENGER AND FREIGHT INFRASTRUCTURE

One of the main challenges faced by the rail freight industry is ensuring the timely delivery of freight services to intermodal depots, ports and other logistics facilities in ever increasing congested network. This is influenced by a range of factors outside the control of rail operators, including, but not limited to:

- passenger rail services, maintenance vehicles and passenger backup rolling stock being afford priority over freight movements in urban areas
- different network owners
- the state of regional track infrastructure
- a lack of rail paths and due to different network owners, difficulty in aligning paths between adjoining owners

Overcoming these obstacles is integral to the improving supply chain efficiency.

The current shared freight and passenger rail system throughout the Sydney basin creates congestion and inefficiencies for both freight and passenger traffic, which will worsen as the city's population increases and freight volumes rise.

ARA believes a priority action for the NSW Government should be the separation of freight and passenger lines. According to the National Transport Commission, across Australia's five largest cities, there are approximately 500 kilometres of shared passenger and freight lines.

The ARA welcomes the Strategy's proposal that there will be an increase in the dedicated freight rail corridors throughout the Sydney basin.

We also encourage governments to complement works to separate passenger and freight lines with an investigation into peak spreading to look at ways to move heavy vehicles out of peak periods which puts additional strain on the network.

5. INLAND RAIL

Inland rail, which will connect Melbourne and Brisbane via regional NSW and Queensland, is the most significant rail freight infrastructure project currently in Australia and will be of major benefit to NSW. It will help to divert Melbourne-Brisbane freight from the Sydney metropolitan area, with modelling by the Australian Rail Track Corporation (ARTC) indicating that up to 70 freight services per week would be diverted away from Sydney metropolitan region by 2050 because of Inland Rail.

Inland Rail will also significantly benefit NSW producers by unlocking new domestic and international market opportunities. In particular, strong economic benefits are expected to flow to producers in northern and western NSW which are some of Australia's most productive agricultural regions.

To maximise planned industry investment in freight facilities at Parkes – which sits at the intersection of the Sydney Perth rail line and the rail line from Melbourne to Brisbane – the ARA encourages consideration of infrastructure upgrades to the rail line between Parkes and Sydney to allow containers to be moved from Port Botany to Parkes for distribution. These include additional passing loops and passing lanes, curve and gradient easing and improved signalling.

6. CORRIDOR PROTECTION

The benefits of improved freight corridor protection measures are demonstrated by Infrastructure Australia's (IA) July 2017 report Corridor Protection – Planning and Investment for the Long Term⁶ which concluded that improvements in long-term infrastructure planning is an important means of lowering the cost of new infrastructure.

In its report, IA found corridor protection and early acquisition could save up to \$10.8 billion across seven projects on the 2016 Infrastructure Priority List. This included key rail freight projects including the Hunter Valley Freight Line and Western Sydney Freight Line.

More broadly, the ARA supports the development of national framework for corridor protection with a focus on shared investment in corridor protection. Under this approach, a national framework would guide governments, including the NSW Government, to:

- prepare agreed, robust plans
- prepare feasibility studies on the corridors arising from those plans
- establish joint funding and governance arrangements to protect and capture the value in those corridors.

ARA encourages all Governments, including NSW, to adopt IA's recommendation for a national framework for corridor protection with a focus on shared investment in corridor protection.

In addition to planning for future transport corridors, the ARA encourages TfNSW to identify and protect future freight precincts, with a particular priority on the identification and prioritisation of strategic sites.

This includes corridors such as the Western Sydney rail freight corridor. Infrastructure Australia has estimated in its aforementioned report that its timely preservation could save NSW taxpayers approximately \$1.6 billion.

7. URBAN ENCROACHMENT

Inappropriate urban development around freight facilities, such as high-density housing occurring around Port Botany, is having a detrimental impact on the industry's ability to provide an efficient, 24-7 service to its customers.

Urban encroachment around freight facilities has been identified by the ARA as one of the key risks facing the rail freight industry in all capital cities, particularly Sydney

It is critical therefore that there is strong integration between the different arms of government in regards to future land use and transport planning to ensure interoperability between transport and urban planning. The Government must ensure planning is holistic, thereby providing greater business certainty, and including transport connections in the planning and construction phase, not post-construction.

8. INTERGRATION WITH OTHER JURISDICTIONS FOR LONG TERM PLANNING AND FUNDING

The ARA urges TfNSW to ensure the strategy appropriately integrates with other jurisdictions to maximise interstate benefits and subsequent flow on benefits within NSW in having a nationally coordinated transport plan.

Long term planning that incorporates all modes and all levels of Government is vital. Australian cities need plans that ensure the necessary level of capacity on current systems, that new rail projects are identified and constructed to boost capacity and that future corridors are identified and preserved. The ARA advocates for the establishment of medium to long term city plans or 'City Blue Prints' that all parties agree to, to provide plans for our cities and remove public transport and infrastructure investment from political cycles, minimise opposition from other parties, allow faster project implementation and provide certainty to industry and developers. Cities should be viewed as a network to ensure interoperability between transport and urban planning. Planning must be holistic, provide certainty and introduce transport connections in the planning and construction phase, not post-construction.

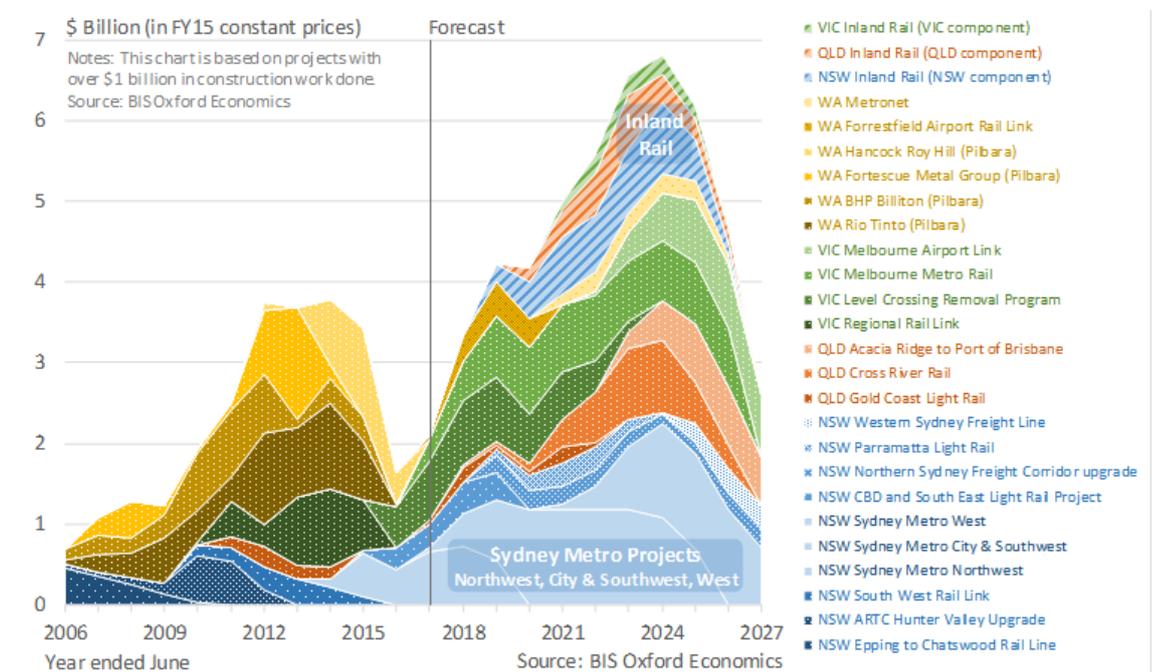
In a similar vein, the ARA also encourages the NSW Government to ensure the Draft Future Transport Strategy 2056, and the subsequent Freight and Ports Plan, is integrated with relevant federal plans. This includes, most notably, the Commonwealth's Freight and Supply Chain Strategy. The movement of freight is a national issue, and so consistency in areas such as infrastructure and operations are critical to achieving improved efficiency and safety outcomes.

Significant investment in rail, is not only occurring in NSW, but right around the country (see Figure 1 below). Poaching of employees and wage rises are becoming the norm due to the skills

shortages occurring, particularly for certain skills sets. As such, the ARA encourages NSW to contribute to a national labour market analysis to identify gaps in required skills in the rail industry, in respect to rail project commitments (both government and private investment) over the next decade. Movement of employment across borders is required to meet the investment in major infrastructure and rail projects. A national approach to data collection/ skills gap analysis is required for a more holistic and accurate assessment to address the Australian wide problem.

A study of this nature would inform decisions for promotion and recruitment efforts, delivery and requirements of training, and workforce development planning. It should also influence considerations given in regard to the coordination and timing of the rollout of projects across the country and the impact lumpy demand has on the availability and capacity of the Australian rail workforce and in turn the impact on skills shortages, wage blow outs and organisations willingness to take on apprenticeships and undertake further investment.

Figure 1



9. IMPROVED TENDERING

The procurement process in Australia had been criticised as costly and time consuming. The tendering costs in Australia are estimated to be around 1-2 per cent of a project's total cost, which are high compared with world benchmarks of 0.5 per cent⁷. The ARA proposes that significant benefits could be realised if improvements were made to the NSW government procurement practices.

There is opportunity to implement a more simplified and transparent tendering process with improved risk mitigation practices and contracting arrangements. Harmonisation of standards, having a clear and smooth pipeline of projects, improved feedback sessions and better infrastructure planning would facilitate improved investment and innovation; reducing tendering costs and whole of life projects costs for both the contractor and the procurer.

Harmonisation of Standards

Rolling stock standards are complicated by legacy development of Australia's passenger networks including differing track gauges, loading gauges and traction arrangements, even before operation and customer requirements are taken into account. Political considerations can also influence the design, timing and funding arrangements for new rolling stock. While this may make it challenging to achieve a single platform, clear opportunities exist to at least reduce Australia's 36 different passenger rolling stock classes. The harmonisation of standards would result in significant cost savings and through improved efficiencies and would support innovation if objectives were outcome based. It is estimated that \$2.5 billion in planning and design cost savings and \$1.1 billion in component cost savings could be realised if rolling stock platforms and componentry were harmonised⁸.

An integrated and national approach to rolling stock orders

Australian passenger rail networks require the continued purchase of rollingstock to replace their ageing fleets and accommodate growing and forecast patronage numbers. Rollingstock procurement tends to be volatile, high profile, complex and influenced by political and operating considerations. Procurement challenges are seeing the cost to deliver rollingstock increase year-on-year, a cost incurred by governments.

State Governments are the primary investors in new rollingstock but there is currently no national collaboration to achieve economies of scale. The NSW Government orders independently as the need arises and in doing so, stipulates state-based specifications, component variations and standards that provide manufacturing challenges that add to the total cost and at times, project timelines. This lack of cohesion has resulted in procurement inefficiencies, creating a sporadic investment cycle and a 'lumpy' flow of orders which hinders the growth of Australia's rail manufacturing sector and ultimately increases the cost to government. Approximately \$15.5 billion in economic activity could be maintained should coordinated planning result in the demand for rolling stock being smoothed⁹.

Whilst rail manufacturers are likely to retain a local role in repair, maintenance and refurbishment, the future of Australia's rail manufacturing industry is heavily dependent on its ability to remain relevant to key customers. As the ultimate owners of passenger rail operations, state governments are the rail manufacturing industry's main customers.

Like other Australian manufacturing sectors, rail manufacturing faces considerable challenges to remain competitive in globally. Cohesion between states to satisfy demands and plan nationally for the future is essential. Harmonisation of rollingstock standards and procurement is a priority that will benefit industry and governments.

Rail is a victim of Federation. But we can overcome this. The ARA recommends that the NSW Government work with Industry and other jurisdictions to develop a nationally coordinated passenger rollingstock procurement process and in doing so, secure the future of Australia's rail manufacturing sector.

In November 2013, the ARA commissioned Deloitte Access Economics to identify improvement opportunities for passenger rollingstock procurement in Australia¹⁰. The study found that over the next 30 years, approximately \$30 billion will be spent by state governments on the procurement of heavy rail passenger rollingstock to meet increasing patronage demands and replace ageing fleets. During this time, improved procurement processes and planning, such as improved scale, reduced planning and design costs and harmonised componentry could save state governments almost \$6 billion.

Given the significant amount of rail infrastructure development and rolling stock procurement forecast for the next 30 years, failure to implement better procurement practices could mean a

considerable portion of domestic economic activity lost not to mention the risk to local jobs, skills, capability, rail infrastructure efficiencies. It's vital that the procurement process does not create unnecessary, adverse effects when planning the project that would impact the whole life performance of the asset. Significant cost savings are available if the procurement process is streamlined, simplified and transparent.

10. VALUING SUSTAINABILITY

The ARA recommends consideration is given to adopting the key principles of the Infrastructure Sustainability Council of Australia (ISCA) through the IS rating scheme – 'an industry-compiled voluntary sustainability performance rating scheme to evaluate the sustainability (including environmental, social, economic and governance aspects) of infrastructure projects and assets¹¹. The ARA recommends consideration is given to the IS rating scheme to assess and improve the IS rating of future transport infrastructure projects. This would need to be implemented from the design stage of a project and fed through all stages.

11. A NATIONAL TICKETING SYSTEM

Australian jurisdictions have adopted smart ticketing systems such as the Opal card in Sydney and Myki in Melbourne. These systems provide extremely useful data on patronage and system use for operators and while they continue to be refined for improved customer experiences, the long-term plan should be the establishment of a nationally integrated smartcard ticketing system that provides micropayments, for all modes of public transport. This could broaden the rail operator revenue base for reinvestment in the system rather than seeing each jurisdiction individually invest in their systems. This approach would also support tourism transport, in providing ease of travel and promotion of public transport travel across the country.

12. OPTIMISATION OF CURRENT RAIL INFRASTRUCTURE

For NSW's passenger rail networks to function effectively in the service of its cities and its people, significant new levels of funding are required to maintain and upgrade existing systems and provide additional capacity to better manage future patronage growth. NSW cities and

regions will only continue to prosper with continued improvements and expansion of existing public transport systems and seamless integration with alternative modes of public transport.

Improvements to the quality of existing track and rollingstock as well as signalling system upgrades will provide improved service and permit faster rail connections using existing rail lines.

The value of incremental improvements must not be underestimated from both a safety and efficiency perspective. Gradual infrastructure upgrades that permit speed increases of 10km/hr will still vastly improve the service offering and rail's ability to compete with road on regional and inter-city routes and within metro networks.

Rail extensions and faster trains will reduce commuters travel journeys and potentially enable commuters a feasible option in accessing more affordable housing on the outskirts of the city, while working in the CBD.

With regard to outer-lying suburbs and the continued expansions of our cities, the ARA proposes that TfNSW adopt a policy to introduce fixed transport connections, including heavy or light rail, in the planning and construction phase, not post-construction. In addition, supports TfNSW to encourage regional growth and employment through improved regional rail connections and high-speed rail.

13. SMART TECHNOLOGY

To maximise the service offering on existing rail networks, modern technologies and integrated systems such as automated train control, intelligent transport solutions and asset management tools will allow operators to run trains closer together while increasing safety and infrastructure capacity to accommodate growth to both the passenger and freight rail networks. In 2018, the ARA will commencement development of SMART Rail, a digital road map for the industry.

It is intended that the route map will provide a framework through which next generation rail technologies can be integrated and supported in the Australasian rail environment.

The aim is to help ensure systems are interoperable and the right data is available to deliver cross-industry benefits, including safer operations, improved reliability, opportunities for innovation and reduced costs through efficiencies, automation and technology selection.

The ARA would welcome TfNSW's active involvement in workshops to develop the SMART RAIL digital route map.

Politicians, regulators and procurers need to be mindful when developing legislation, design specifications and standards, that they are not too prescriptive to inadvertently restrict innovation and the most optimal operational outcomes.

While technologies can assist in optimising the service offered by existing infrastructure, expansion and upgrades to infrastructure is still a vital piece of the puzzle in meeting the needs of our growing population.

Operators continue to improve fuel usage and energy efficiency to decrease operating costs and improve environmental performance. Government support of these programs will ensure sustained improvement in this space.

14. WORKFORCE DEVELOPMENT, SKILLS & TRAINING

It is important for the NSW Government to ensure that training methodologies are leading edge and keep abreast of future skill needs and training requirements and emerging technologies. The application of simulators and virtual reality methodologies can enhance this endeavour with reduced training times, greater retention and little risk.

Millennials are now seeking 'skills for life' as opposed to a 'job for life', as such career aspirants are keen to develop generic skills which give them flexibility and mobility throughout their career. Core competencies are critical so as to provide a base for preferred specialisations. Apprenticeships that require a set four-year term are of diminishing relevance and no longer serve to attract talent. Condensing training periods or expanding competency requirements into other disciplines may serve to improve participation, without compromising outcomes.

In addition, enabling the easy movement of workforce across borders will ensure capabilities are maintained enabling sustainability and continued performance of NSW's critical transport and

infrastructure task. Commonly agreed training competencies and standards make it easier for employees to move and work across jurisdictions and for employers to ensure their staff meet the national, agreed training requirements and aid in recognition and transferability of employee's skills.

Given the current and continued significant investment in transport and infrastructure taking place across NSW, skills shortages are being identified in key areas. The NSW Government should consider the provision of incentives for companies to undertake training in areas of particular need.

15. ACCESSIBILITY

Passenger rail provides extensive access opportunities for people with all levels of ability or inability. Integration of all modes of transport so that a seamless transport journey is available helps position public transport as a viable alternative to the car. When car travel is not a viable option, the integration of public transport systems is even more important.

Transport modes must work collaboratively to maximise the service offered to customers. There is a need to ensure that the passenger rail sector is effectively integrated with other modes of public transport (buses, ferries), paratransit (taxis, car sharing) and active transport (walking, cycling). Only in this way will passenger rail and other complementary modes of transport provide a seamless, complete mobility package that will drive mode shift from cars to public transport over the longer term.

Since Disability Transport Standards were introduced in 2002, passenger rail operators have made a commitment to continuously improve the accessibility of passenger rail systems. Nevertheless, considerable investment is still required to ensure legislated targets for accessibility are met by passenger operators. However, due to the historic nature of some rail assets, such as underground train stations and the widths of their platforms, some aspects of the standards are impractical and impose significant regulatory and financial burdens on the passenger rail sector, making compliance a great challenge for operators. Integrated planning and urban design are essential for future proofing new public infrastructure developments and upgrades; consideration must be given to the time, cost and limitations in modifying existing,

often significantly aged infrastructure, and the alignment between transport standards and premises standards.

The overall objective should be the dignity and independent movement of people with a disability; as such less prescriptive and more objective based approaches would encourage innovative and cost-effective design solutions, resulting in better functional outcomes for people with a disability. For example, ARA members are focusing not only on improvements to infrastructure and rolling stock, but also on customer experience innovation for people with a disability.

The ARA seeks the NSW Government's understanding and support as the industry works to modernise the Disability Transport Standards.

CONCLUSION

TfNSW's Future Transport Strategy 2056 provides a significant planning opportunity to meet the challenges of a growing passenger and freight transport task. A range of operational and regulatory aspects need to be addressed for a truly efficient, accessible, integrated and beneficial passenger and freight transport system. The recommendations contained in this submission provide emphasis on aspects raised in the draft strategy, and the ARA appreciates the opportunity to profile them.

For further information regarding this submission, please contact Natalie, General Manager Passenger and Industry Programs via ncurrey@ara.net.au or 02 6270 4512.

1 Deloitte Access Economics, *Value of Rail – The Contribution of Rail in Australia*, November 2017 <https://ara.net.au/value-of-rail>

2 Deloitte Access Economics, *Value of Rail – The Contribution of Rail in Australia*, November 2017 <https://ara.net.au/value-of-rail>

3 Bureau of infrastructure, Transport and Regional Economics (2015). *Traffic and congestion cost trends for Australian capital cities* (2015)

4 Bureau of infrastructure, Transport and Regional Economics (2015). *Traffic and congestion cost trends for Australian capital cities* (2015)

5 Deloitte Access Economics, *Value of Rail – The Contribution of Rail in Australia*, November 2017 <https://ara.net.au/value-of-rail>

6 Infrastructure Australia, *Corridor Protection, Planning and Investing for the Long Term*, July 2017

<http://infrastructureaustralia.gov.au/policy-publications/publications/corridor-protection.aspx>

7 Rail Express, *The Sustainability of Rail Contracting in Australia*, 2012

8 Deloitte Access Economics, *Opportunities for Greater Passenger Rolling Stock Procurement Efficiency*, September 2013

9 Deloitte Access Economics, *Opportunities for Greater Passenger Rolling Stock Procurement Efficiency*, September 2013

10 Deloitte Access Economics, *Opportunities for Greater Passenger Rolling Stock Procurement Efficiency*, September 2013

11 www.isca.org.au/is-rating-scheme/is-overview/is-rating-tool