Rail Freight Solutions
Central West and Blue Mountains
6 August 2020

This paper outlines opportunities for improving freight on rail and transport options. Many of these improvements are solutions already suggested in government reports that are listed below. For more detail and supporting research see copies of the full reports on the Blackheath Highway Action Group website: bag.asn.au

Blackheath Highway Action Group (BAG) has made every effort to ensure the information at the time of compiling this report is accurate. Governments, and therefore priorities, for infrastructure spending change continually, but the decision to focus on more investment in rail for the movement of people and freight is a positive step in the right direction from an economic, environmental and social perspective.

BAG believes that investment in road transport should not be made in isolation. Rather, investment in transport should be based on a needs approach, and should only be made after consideration of all transport modes. It is essential to choose the transport mode which delivers the best performance in terms of economic, environmental and social outcomes.

Inland Rail

The Inland Rail route between Melbourne and Brisbane is at present under construction. Started in 2018 and due to be finished in 2025, this line will support efficient movement of freight by rail, providing better connectivity for agricultural produce to ports and reducing the movement of freight by road between Melbourne and Brisbane via Sydney. The Inland Rail line will allow direct rail access to a number of operational intermodal terminals of national importance located in Bathurst, Dubbo, Parkes, Forbes and Blayney.

One of the most important terminals for its strategic and national significance to freight logistics in Australia is the Parkes National Logistics Hub. This hub offers direct rail and road links to Melbourne, Brisbane, Sydney and the key ports of Newcastle and Port Kembla. In addition, Parkes is strategically situated on the transcontinental railway line, which will allow double-stack container access to Adelaide and Perth. The Inland Rail line will also provide a link to Darwin via Adelaide The capacity of the Inland Rail route is documented at 160 train paths (round trips per week), giving a capacity the equivalent of 674,000 round B-Double trips per year, and the ability to modal shift 40.6 million tonnes of freight from road to rail.

The national significance of the Inland Rail project is noted by the Prime Minister's recent announcement of fast-tracking the project by bringing forward $1.5 billion of funding, making this project the number one priority of his COVID-19 infrastructure recovery.

In July 2020 the NSW government announced $185 million for construction of rail-associated infrastructure delivery in Parkes. This will enable the Parkes Special Activation Precinct, to develop a logistics and intermodal hub. The precinct stretches over 4,800 hectares of land, and can be used for purposes such as freight and logistics, food processing, warehousing, plastic and e-waste recycling, and cold chain storage. The precinct will also focus on sustainability, as it will be Australia's first UNIDO Eco Industrial zone. The initiative of the United Nations Industrial Development Organisation seeks to enhance the environmental, economic and social performance of industrial businesses through collaboration.

Connecting and Improving Existing Rail Lines

The current rail freight network includes routes from Parkes, Narromine and Dubbo which connects the Central West to the Western, Murray-Murrumbidgee, Hunter and Sydney regions. A full investigation of the longer term (present to 2033) demand of the main western line needs to be carried out. A key issue to be resolved is the cost-effectiveness of upgrading the main western line to higher productivity standards compared with on-going and replacement maintenance costs to current standards.

The NSW Government made a commitment to investigate the feasibility of re-opening the Blayney to Demondrille rail line as a regional freight line. BAG understands the feasibility report has been completed, and we support the Lachlan Regional Transport Committee and all Central West Councils in their efforts to get this line re-opened.

The Evans & Peck Independent Review of Great Western Highway Upgrades West of Katoomba report noted the need for further investigation of rail as an alternative for the movement of freight between the Central West and Sydney. The report recommended that a further study be done. The NSW Government has not enacted this recommendation.

The RDA Central West Freight Study of 2014 notes:

> The movement of low volume general freight by rail is found to be generally uncompetitive in the Central West compared to road freight for short haul into the Greater Sydney region and NSW ports. This is due primarily to the extent to which costs are recovered through user pay arrangements. Above and below rail costs are generally recovered through the cost of freight whereas road freight costs are not recovered to the same extent. Rail is however, the most efficient method of transporting bulk goods at high volumes.
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> The Study Team believe that some commodities traditionally hauled by rail are at threat of being lost to road freight, as road freight rates reduce through competition and road vehicles become more efficient. Existing rail users have also expressed the need for greater capacity through the Central West for rail to remain competitive. A loss of bulk rail freight services in rural towns would result in a significant additional burden on local roads, a number of which are not suited to heavy vehicle transport due to pavement width and safety issues.

BAG agrees with the findings of the RDA Central West Freight Study in relation to rail and supports the recommendations contained in the report.

It is clear that further work needs to be done to determine how to best maximise the existing rail network whilst building on the productivity gains offered by the Inland Rail line and the new hub at Parkes.

The limitations of Newcastle Port also need to be considered as part of this process. It is clear that the percentage of freight exports of agricultural products by container to Asia will increase over time, especially given that a substantial number of containers leaving Port Botany bound for Asia are empty. Therefore, the need to review container movements through Newcastle needs to be considered, and any rail network connections need to factor this in.

BAG believes that the recommendations of the Central West Transport Needs Study (2008) should be acted upon: namely, the need for a review of rail in the Central West, and the construction of a crossing loop at the Elong Elong and Merrygoen junction triangle.

Improved junctions and refuges at Elong Elong and Merrygoen junction triangle would accommodate longer trains, releasing an existing pinch-point on the Dubbo to Newcastle rail corridor. This would benefit the Central West by releasing train paths over the Blue Mountains. In 2009 this cost was estimated $27million.

Western Line (Blue Mountains Line)

Bi-directional signalling allows more flexible train movements in both directions across the Blue Mountains, thereby increasing capacity without the need for new lines. At present, there is bi-directional signalling between Bell through the Ten Tunnels to Lithgow. There is also bidirectional signalling between Valley Heights and Springwood, and through Katoomba. Rolling out bi-directional signalling across the entire Blue Mountain line between Penrith and Lithgow would greatly increase capacity without the need to install an additional line. This would provide significantly more train paths and offer greater flexibility for passenger and freight train movements across the Blue Mountains. The estimated cost to achieve bidirectional signalling across the entire Blue Mountains line would be between $50 and $75 million. Existing passing loops at Lawson and Katoomba should be extended to ARTC standards to allow longer freight trains across the Blue Mountains.

In summary, modifications to rail lines in the Central West, such as the construction of improved junctions and refuges at the Elong Elong and Merrygoen junction triangle; re-opening the lines from Blayney to Demondrille and from Maryvale to Gulgong, and completion of the Maldon to Dombarton line, would increase rail capacity in the NSW Central West, whilst also increasing rail capacity across the Blue Mountains by freeing up existing train paths. These initiatives, some of which have a positive benefit cost ratio (BCR) and are shovel-ready, would cost only a fraction of the proposed duplication of the Great Western Highway between Katoomba and Lithgow.

Sydney Area Network

Port Botany handles 99% of NSW's container movements, making it a critical international gateway for Australia and an economic powerhouse for Sydney and New South Wales. The NSW Ports Master Plan estimated that container movements through Port Botany would grow from 2.3 million twenty-foot equivalent units (TEUs) in 2015 to between 7.5 million and 8.4 million TEUs by 2045.

Currently there is a single dedicated freight line linking Port Botany to the Sydney rail network. Work has now commenced on duplicating this rail link. To address constraint and reliability issues, the Australian Rail Track Corporation (ARTC), plans to upgrade the capacity of the Port Botany rail line by duplicating 2.9km of the line ($273m). Construction of a passing loop at Cabramatta ($115m) on the Southern Sydney Freight Line will also allow freight trains travelling in either direction to pass each other. Infrastructure Australia have declared the Port Botany Rail Line Duplication and Cabramatta Passing Loop as a priority project with a net present value (NPV) of $429.7 million and a benefit-cost ratio (BCR) of 2.68 (5 August 2020).

Infrastructure Australia's evaluation of the ARTC business case found that there is strong strategic merit for these projects as they support the NSW Government's aim to increase the mode share for containers from road to rail. Currently, more than 80% of containers to and from Port Botany are transported by road. This significantly adds to congestion on the Sydney road network, particularly in and around the already constrained Port Botany precinct, which includes Sydney Airport and the M5 Motorway.

In June 2020 the NSW Government approved the St Mary's Freight Hub. This hub will facilitate the movement of freight for export from Western Sydney to Port Botany via rail.

An estimated 301,000 freight containers will be transported by rail between Port Botany and St Mary's. Moving freight on to rail will help improve road safety, ease traffic congestion, and reduce emissions on Western Sydney motorways and roads. In particular, trucks that currently travel during peak hour to meet midday deadlines will be removed from commuter traffic.

The Federal Government has announced the construction of a dedicated rail freight line between St Marys and Moorebank via the new second Sydney airport being developed at Badgerys Creek.

In 2006 the NSW Government included the quadrupling of the western rail line from St Marys to Penrith as a key infrastructure project for the development of Western Sydney.

The combination of the quadrupling of the rail line between St Marys and Penrith and the construction of a dedicated rail freight line between St Marys and Moorebank via the second airport will address current congestion on the Sydney metropolitan rail network, providing freight operators with more train paths and greater reliability in accessing Sydney and Port Botany.

Blackheath Highway Action Group continues to call for these two projects to be funded as a matter of priority. We again note that these two projects combined would cost less than the proposed duplication of the Great Western Highway between Katoomba and Lithgow. However, unlike the proposed highway duplication, these projects would generate significant short and long term economic, environmental and safety benefits for the NSW Central West and Sydney.

Double-stack Rail and Constraints on Application in Australia

Double-stack rail transport is a form of intermodal freight transport where containers are stacked two high on railway wagons. Introduced in North America in 1984, double-stacking has become increasingly common, with the majority of intermodal transport now done in the form of double stack trains. Adoption of double-stacking was made possible by the fact that the majority of the American rail network already had sufficient structural clearance through tunnels, under bridges and overpasses, etc. (known as the Structure Gauge) which allowed a higher loading gauge. The Obama administration funded improvements on some of the East Coast networks to allow double-stacking to become even more widespread.

Double-stacking greatly increases efficiency from an economic and environmental perspective because twice the number of containers can be moved without the need for extra trains.

Australia has progressively introduced double-stacking over the past 20 years. Double-stacking now operates on national main lines west of Parkes, and north from Adelaide, via Port Augusta, to both Perth and Darwin. The new Inland Rail project will allow double-stacking from Melbourne to Brisbane via Parkes.

East of Parkes towards Sydney, double-stacking is currently not possible due to significant structural gauge constraints involving tunnels, overbridges, track curvature, and electrification east of Lithgow. The electrification alone precludes high loads. At present, elsewhere in the world, operation of double-stack loads under overhead electrification is still experimental, and only on dedicated purpose-built track. A significant business case would have to be mounted to justify works to allow the line from Parkes to St Marys to accommodate double-stacking. However, given the cost of the proposed highway duplication

(more than $7 billion based on similar road projects in NSW), the cost of modifying rail infrastructure to allow double-stack containers from Parkes to St Marys may be comparable.

Noise from Trains

Rail squeal is a source of complaints from nearby residents. This is the high-pitched noise mostly created by a train rounding tight bends. The noise is the result of the rail wheels skidding across the top of the rail head, and the flanges contacting the sides of the head of the rail. Relatively inexpensive measures can be put in place to drastically reduce rail squeal. Reduction in the noise nuisance created by rail squeal can be achieved by:

- Maintenance of rail profile (the shape of the rail head)
- Maintenance of wheel sets (the shape of the wheel and flange profiles)
- Effective lubrication of the flange and rail head interface. New electronically-controlled systems have been introduced overseas as well as on the Sydney suburban system These systems provide controlled small doses of lubricant, when needed, to the inside of the rail head, typically on the entry into curvature.

Conclusion and Future Directions

Comprehensive analysis is required that builds on the recommendations in many reports, particularly the RDA Central West Freight Study 2014, the Central West Transport Needs Study and the implications and opportunities arising from the Inland Rail line between Melbourne and Brisbane. Following this, consideration should be given to an integrated transport approach to freight and passenger movement between the Central West and the coast. The analysis should consider the Blue Mountains as part of a wider road and rail transport network, and consider as a minimum the following key areas:

- Road, rail and port connectivity, and the location of multimodal terminals
- Connection to ports, i.e. Port Kembla, Port of Newcastle and Port Botany, as well as Melbourne, Brisbane and Darwin
- A longer-term approach to meeting demand through capacity growth, including the potential for use of different transport modes to meet future freight needs
- Differentiation of the roles of the Great Western Highway and the Bells Line of Road in the road transport network, as well as identification of possible connections to the Sydney motorway network from the Bells Line of Road. This would benefit Richmond and Windsor, as well as the NSW Central West.
- Socio-economic and environmental impacts for future investment in new road and rail alignments
- Development of a long-term capital investment program of works which would deliver an integrated transport network solution.

There are a number of initiatives that could assist with a modal shift from road freight to rail freight over time which may include, but are not limited to:

- Mass distance charging of heavy vehicles to establish a more level playing field. Currently, rail operates on a full-cost recovery plus return on investment, whereas road freight charges do not cover maintenance, let alone the substantial capital investment required to construct roads capable of allowing 25/26/30 metre long high-performance vehicles. We note the recommendations of the Henry Tax Review in this regard. Similar cost considerations in the USA mean that B-doubles are not permitted on the USA interstate highway network.

- Standardising and simplifying compliance costs for rail across Australia. (e g: There are three separate rail network managers in the NSW Central West.) This has been done for road freight but not rail freight.

The RDA Central West Freight Study - 2014 predicts peak freight flow through the Great Western Highway to increase from 6.4 million tonnes pa in 2014 to 11.6 million tonnes pa in 2034, an increase of 81%. Rail freight at Lithgow through the main Western Line is predicted to increase by 79% during the same period.

Given just these two figures, it would seem more than reasonable to hope that ongoing funding of the road and rail network is applied purposefully, and at the appropriate time, to provide maximum economic, environmental and social benefits and give value for money.

References and Relevant Reports

- Intermodal Trends – A review by Corridor, ARTC, 2008
- Central West Transport Needs Study (2009)
- Independent Review of Great Western Highway Upgrade West of Katoomba- Evans and Peck (2012).
- Bells Line of Road: long term strategic corridor plan (2012).
- NSW Long Term Transport Master Plan December 2012
- Central West Regional Transport Plan 2013
- RDA Central West - Freight Study (2014)
- Transport for NSW - Containerised Cargo Demand Assessment Central West NSW, September 2015
- Australian Infrastructure Plan 2016
- Inland Rail - Central West NSW - Regional Economic Analysis On The Potential Impact Of The Proposed Inland Rail (2016)
- NSW Freight and Ports Plan 2018-2023 (2018)
- Infrastructure Australia Regional NSW Road Safety Network Safety Improvements (2019)
- Infrastructure Australia - Port Botany Rail Line Duplication and Cabramatta Passing Loop approved priority project. April 2020
- https://inlandrail.artc.com.au/