



Appendix E - North-South Rail Corridor – DOTARS Study

In September 2005, DOTARS commissioned a study of the proposals to build an inland freight railway from Melbourne to Queensland, the Study Team¹ was required to determine:

- route options;
- projected demand;
- environmental issues;
- market assessment;
- financial and economic impacts; and
- other transport infrastructure requirements.²

The Study Team examined 136 possible route options to reach the short-listed group. The alternative routes were compared using an optimisation model developed for the study. In its analysis, the Team applied three different demand scenarios (A, B and C) and three levels of capital expenditure: \$1.5 billion, \$3 billion and an unconstrained budget.³

The Team then examined and compared eight distinct route options, based on four sub-corridors. Each of these could be combined with alternative routes between Melbourne and Junee. The four sub-corridors were:

1 Ernst & Young, Hyder Consulting Pty Limited and ACIL Tasman Pty Limited.

2 Ernst & Young, Hyder Consulting and ACIL Tasman, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.3.

3 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, pp.5 and 7.

- Far Western;
- Coastal;
- Central Inland; and
- Hybrid (which combined inland and coastal elements).⁴

A financial and economic analysis was also applied, which considered: the net budgetary effect of funding optimised routes by government, the commercial feasibility of each route and the wider economic cost/benefit effects in each case.⁵

Far Western Sub-Corridor

This corridor runs from Melbourne to Parkes, Dubbo/Narromine, Coonamble, Burren Junction, Narrabri/Moree, North Star, Goondiwindi, Warwick/Toowoomba and Brisbane. Within the corridor there are 42 possible route alternatives; the total distance is between 1657 and 1926 km.⁶

New track is required in six sections and upgraded track in two more. This corridor provides the shortest journey and avoids the Sydney region rail traffic congestion. However, it does need significant investment in new infrastructure.⁷

The route would provide transit times between 20.4 hours (via Albury) and 21.3 hours (via Shepparton). The Shepparton variant has the advantage that it would allow trains of more than 1,800 metres and double stacking of containers - provided the Bunbury Street tunnel in Melbourne is upgraded.⁸

This corridor would have the potential to capture additional freight from Southern Queensland, travelling west, and from Perth to the east coast. It could also divert some southern and western NSW freight away from other ports, towards Brisbane and Gladstone. The Far Western Corridor is the least developed and generally has a low level of environmental constraints.⁹

The study did not rate this corridor highly for economic and financial viability. A capital expenditure of \$1.5 billion would not be enough to build a

4 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.5.

5 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.7.

6 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.9.

7 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, pp.9 and 10.

8 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.11.

9 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.13.

Class 1 freight line. Transit times would be relatively poor also: 30 hours Melbourne to Brisbane via Shepparton and 26.4 hours via Albury.¹⁰

The \$3 billion capital expenditure case is almost enough to complete a Class 1 freight line and also achieve an acceptable transit time. It would take \$3.1 billion (Albury) or \$3.6 billion (Shepparton). On the route through Albury it would give a transit time of 22 hours. With unconstrained expenditure this corridor would provide both the fastest transit time (21.3 hours via Shepparton and 20.5 hours via Albury) and the lowest cost of any of the four sub-corridors.¹¹

Although the Shepparton alternative could benefit from additional regional freight flows, it requires a considerable amount of new line construction. The team considered that the Albury alternative would provide greater opportunities for improved transit times.¹²

Central Inland Sub-Corridor

The Study Team Looked at 65 possible variations on this route – all passing through Werris Creek, Armidale and Tenterfield. The distance varies from 1,774 to 1,961 km. The corridor is only marginally longer than the Far West corridor, but generally steeper grades would imply higher operating costs. There is also a need for new track between Armidale and Tenterfield and two other sectors. Two sectors require upgraded track.¹³

The fastest possible transit times are 23.1 hours (via Albury) or 24.2 hours (via Shepparton); this is not fast enough to allow overnight transport of freight to Brisbane. In addition, the cost would be higher - \$7.96 billion (Albury) and \$8.48 billion (Shepparton).¹⁴

If the Albury route is used, double stacking of containers will not be possible south of Junee. If Shepparton is used, it will allow trains of more than 1,800 metres and double stacking. However, the Bunbury Street tunnel restriction would have to be addressed.¹⁵

To achieve the required transit times on this route, will need substantial infrastructure investment. Work is needed on the Bethungra Spiral, several

10 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.15.

11 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, pp.15 and 17.

12 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.17.

13 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.19.

14 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.19.

15 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.19.

deviations from the present alignment, and a series of tunnels and viaducts in the Toowoomba Ranges, to bypass low speed curves and steep grades.¹⁶

This sub-corridor also has some major environmental limitations, such as: threatened species, Commonwealth heritage items and a National Park. Further complications arise with the complex of river networks to be crossed; requiring a high number of crossing points.¹⁷

In addition to the north-south traffic, this route could divert some of the traffic moving from regional areas to the ports; although less grain and cotton would be involved than on the western route.¹⁸

The report found that this option was not financially attractive, because of the high capital expenditure needed and the relative inelasticity of freight flows. The \$1.5 billion option would not be sufficient to build a Class 1 freight line. The limit on expenditure would eliminate several major projects and leave the route with significant speed restrictions and uncompetitive transit times.¹⁹

The \$3 billion option would also be insufficient for a Class 1 line and would only make the transit times marginally competitive with road freight. Even unconstrained expenditure would only produce transit times of 24.5 hours (via Shepparton) or 23.7 hours (via Albury). Of the four sub-corridors this would be the second slowest.²⁰

The options on this route would benefit from additional regional freight flows; Shepparton more than Albury. However, the Shepparton option requires more capital investment for new and re-aligned track. The Albury alternative offers more opportunities for improved transit times.²¹

Coastal Sub-Corridor

The route has the same Melbourne to Junee options as the first two sub-corridors. It then deviates to the existing coastal route, via Goulburn, Sydney and Coffs Harbour. Some of the track on this route is already part of the ARTC's work program – expected completion date 2009 – to give a transit time of 27 hours. It is marginally longer than the Far West and Central Inland routes; between 1,740 and 1,938 km.²²

16 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.21.

17 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.21.

18 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.21.

19 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.23.

20 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.23.

21 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.25.

22 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.27.

Between Sydney and Brisbane, there are problems for trains over 1,500 metres and for double-stacked containers. To overcome these problems, and complete this route would require \$10.21 to \$10.71 billion. It would then provide transit times of 21.6 hours (Albury) or 22.4 hours (Shepparton). Even then, the congestion in northern Sydney would remain a serious problem, which could have an influence on transit times. To overcome that problem, the study said "...would require significant tunnelling".²³

The key to this route is the area north of Sydney. Unless a significant level of investment was committed to solving that problem, gains would be marginal. The current ARTC program will produce improvements, but will not solve the congestion problem. The expected increase in demand generated by the ARTC improvements, will soon consume the extra capacity created. The study suggests that, to be viable, an inland route is needed to take pressure off the coastal line.²⁴

This is the most developed corridor, and has the highest number of limitations. Environmental constraints include: five National Parks, a World Heritage area, ten Commonwealth Heritage items, two significant wetland areas and the habitats of 84 threatened species.²⁵

This route is not considered viable under any of its internal options. Capital expenditure of \$1.5 billion would provide a more efficient Class 1 freight line but only marginally enhance the operation of the current route. The \$3 billion option would produce transit times of 26.5 hours (heading north) and 26.8 hours (heading south) via Shepparton. The Albury route would be 25.5 hours either way.²⁶

To achieve the fastest possible transit times of 22.4 hours (Shepparton) or 21.6 hours (Albury), would require capital expenditure of \$10.7 billion. This would be the second-fastest of the four sub-corridors, but these calculations do not take account of congestion delays north of Sydney. The sub-corridor would not benefit from additional freight flows to the extent that the alternative routes could. The Shepparton route suffers from the same difficulties as discussed earlier.²⁷

23 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.27.

24 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.29.

25 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.29.

26 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.31.

27 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.31.

Hybrid Sub-Corridor

This sub-corridor combines elements of the other three. It passes through Junee, Lithgow, Mudgee, Muswellbrook, Maitland, Taree and Coffs Harbour. It is the longest route, between 1,974 and 2,118 km. The track requires substantial upgrading and improvement - study lists four main projects that would be required. Operating costs would be higher than all the other routes.²⁸

The fastest transit time is 25.6 (Albury) or 26.4 hours (Shepparton) and the projected costs are \$6.32 billion and \$6.80 billion respectively. The times are only marginally below the threshold to effectively compete with road transport.²⁹

This sub-corridor requires significant new infrastructure investment; the main projects being a series of deviations between Dubbo and Acacia Ridge. It shares the restraints of the Coastal route north of Sydney. It was included as a possible way of avoiding the Sydney rail congestion; but, in doing so, it also loses the opportunity to capitalise on moving extra freight.³⁰

The route has the additional handicaps of: greater distance to cover, longer transit times, and higher maintenance and operating costs. It also has several environmental constraints in addition to those on the sectors shared with other sub-corridors - overall, it has as many restrictions as the coastal route. The study found that this route is not financially attractive under any of the options analysed.³¹

Spending \$1.5 billion would further enhance the north coast line but transit times would not be competitive with road freight. Anticipated times are: 30.2 hours (heading north) and 30.5 hours (heading south) via Shepparton. For Albury the estimate is 28.7 hours either way. Increasing the investment to \$3 billion would reduce these times only slightly: Shepparton 28.4 and 28.7 hours; Albury 27.4 and 27.3 hours.³²

The third option would require \$6.8 billion to give the fastest possible transit time via Shepparton - 26.4 hours. For Albury, \$6.3 billion would give a time of 25.7 hours. These outcomes are the slowest of all the sub-corridors.³³

28 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.33.

29 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.33.

30 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.35.

31 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.35.

32 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.37.

33 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.37.

The hybrid sub-corridor would benefit from additional freight in the south (especially the Shepparton Route) but would not have the same advantages in northern NSW. The Shepparton route also has the disadvantages mentioned earlier.³⁴

Market Assessment

Summary of Key Findings

Freight in the corridor is dominated by coal traffic (Hunter Valley) and manufactured goods between Melbourne, Sydney and Brisbane.

The size of the freight market in 2004 is estimated at 220.8 million tonnes. Coal is about 114.6 million tonnes or more than half the total – but it does not travel on the North-South corridor.³⁵

The main freight flows for the purpose of this study were:

- manufactured steel and freight between the three capital cities
- steel and agricultural products on the coastal route
- grain and other agricultural products from inland to the ports.

Within the corridor, the total of road and rail freight movements between the capitals is 21.9 million tonnes, 10 per cent of the overall flow. Manufactures make up about one third of this. Agricultural products, grains and oil seeds are suited to rail transport, and steel and metals are moved almost entirely by rail.³⁶

Road held the overwhelming majority of modal share on inter-capital routes in 2004.

Of the 21.9 million tonnes mentioned above, road carried 80 per cent and rail 15 percent:

- rail's share has been declining for decades because of: improving road and truck design, congestion on rail and the time and cost involved in local pickup and delivery.³⁷

On longer routes, such as Melbourne to Brisbane, rail has a chance to be more competitive with road transport – as pickup and delivery are a smaller part of

34 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.37.

35 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.39.

36 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.39.

37 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.41.

overall costs. Over the shorter distances – Melbourne to Sydney and Sydney to Brisbane – it is more difficult for rail to be competitive.³⁸

Rail freight is a weak competitor to road freight for between 65% and 75% of the manufactured freight market.

The study divides the manufactured freight market into three sectors:

- express freight – high value relative to volume; same day, or next day plus one, delivery (Melbourne to Brisbane)
- availability and reliability sensitive – less urgent; sensitive to transport reliability and availability at times to suit customers
- price sensitive freight – lower value relative to volume; more price sensitive; less sensitive to transport reliability.³⁹

It is unlikely that rail will be able to compete in the express sector. This freight (e.g. postal, courier, just-in-time, components) should continue to move by air or overnight truck. Overnight freight offers more hope. This is the biggest category and moves mainly by road. It is sensitive to both reliability and availability. It could switch to rail if services improve.⁴⁰

Freight forwarders and customers have overwhelmingly indicated that rail services are presently too unreliable to attract significant freight volumes outside of the bulk commodity end of the market.

Performance is measured by four factors: price, reliability, availability and transit time. At present rail performs poorly against all of these factors. Rail transport operators have had to offer freight rates well below those of trucks, squeezing margins to compensate for poor service.⁴¹

The greatest hindrance to rail achieving a good reliability on the inter-capital city route is congestion in the Sydney metropolitan network.

In 2005, reliability from Melbourne to Brisbane was only 40 per cent. Delays were due to: a network constrained by congestion; speed restrictions; lack of passing capacity; low reliability of train operations; one-off events and the curfews on freight trains and passenger service priority in the Sydney network. ARTC's Southern Sydney Freight Line will ease this situation but not remove it.⁴²

38 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.41.

39 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.43.

40 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.43.

41 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.45.

42 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.47.

A combination of factors produces the difficult operating environment for freight trains in Sydney.

Competition with passenger services has resulted in curfews being applied to freight services in the Sydney network. Train paths that allow freight trains to pass are as narrow as 10 minutes, any delay on the ARTC network that causes the freight train to miss its path, can mean a delay of 30 minutes waiting for another – or three hours if it is immediately before a curfew.⁴³

A dedicated freight line on the Sydney-Newcastle sector could provide a substantial increase in reliability for Melbourne–Brisbane traffic. The study team considered this factor alone could double the current rail mode share.⁴⁴

Demand Analysis

The first requirement was for freight and passenger projections on the north-south corridor in 5, 10, 20 and 25 years. The second requirement was to estimate the potential to generate new and contestable freight traffic under various pricing, reliability and transit time scenarios.⁴⁵

Summary of Key Findings

Total market tonnage of freight moved by rail along the corridor is expected to increase over the forecast period.

Three 25-year projections were used for these demand estimates:

- A – GDP growth and freight-to-GDP ratio decline modestly
- B – GDP growth and freight-to-GDP ratio do not decline
- C – GDP growth declines to 2.5 per cent by 2029 and freight-to-GDP ratio is uniform throughout.

The report has used the results of Case A, as the most likely to reflect the true outcome.⁴⁶

The study team expects the Melbourne-Sydney and Sydney-Brisbane sectors to grow slowly. The current ARTC upgrade should help the Melbourne-Brisbane sector to respond more quickly:

43 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.47.

44 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.47.

44 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.47.

45 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.49.

46 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.51.

- If there is an inland route, the share on the Melbourne-Brisbane sector will grow further, with some residual traffic on the coastal route.⁴⁷

Door-to-door price is the single most important determinant of mode decision.

In deciding which mode of transport will be used, most decisions are based on one of three criteria: price, reliability and availability. Of these, the most important for all types of freight is price (at 38 per cent of the total).⁴⁸

Price will be influenced by a number of factors: continuing efficiency improvements; competition within, and between, transport modes; fuel prices; labour costs (including the effects of the growing shortage of truck drivers); road user charges and rail access charges.⁴⁹

Rail's handicap is that, although its line charges may be competitive, the final cost is increased by the addition of local pick up and delivery charges. This particularly affects rail's competitiveness on the shorter sectors – such as Melbourne-Sydney or Sydney-Brisbane – as the local charges are a larger percentage of the total.⁵⁰

Using a weighted average of the responses to their survey, the Study Team estimated that on the longer sectors – such as Melbourne-Brisbane – rail's market share could increase from 30 per cent in 2004, to about 63 per cent (upgraded coastal route) or 73 per cent (inland route options), by 2029. On the shorter sectors, the gains over the same period will be less dramatic: from 9 to 18 per cent Melbourne-Sydney; and 11 to 22 per cent Sydney-Brisbane.⁵¹

The most significant growth in rail's market share is likely to be on the Melbourne-Brisbane corridor. The commodities to be carried will stay much the same. Tonnage carried on rail is expected to increase to 7.4 million tonnes (coastal route) or 8.6 million tonnes (inland routes). The Study team considered that the option of rail to Toowoomba and road from there to Brisbane, would not "...meet the expectations and requirements of customers".⁵²

About 20 million tonnes of freight a year is moved to points on the coastal route, other than the capitals. That total is expected to double by 2029 and

47 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.52.

48 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.53.

49 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.53.

50 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.53.

51 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.53.

52 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.55.

rail's share to increase from 10 per cent to 15 per cent. The short distances are likely to limit rail's gains.⁵³

Other movements along the corridor and then on to other areas, such as northern Queensland and South and Western Australia, are also substantial. These too are expected to double by 2029. The rail share of this freight is expected to reach 25 per cent; or 40 per cent if there is an inland route connecting at Parkes. The gains would be at the expense of road freight.⁵⁴

Except for coal, freight to regional areas should remain relatively modest.

In regional areas, agricultural freight is expected to grow gradually and coal more strongly. The biggest rail freight volumes, from the coalfields, move across, not along, the corridor. The anticipation is that gains would only come from freight particularly suited to rail, such as minerals.⁵⁵

Likely gains would be from the diversion of grain and cotton in NSW (and possibly Victoria), an expansion of coal and grain from southern Queensland, and provision for potential coal freight from new areas of NSW.⁵⁶

Passenger service impacts on the north-south rail corridor – largely in the Sydney-Gosford area

Inter-capital and regional passenger services are not expected to be a significant factor. Services are low in both frequency and patronage. The main problems arise in the congestion produced by urban passenger services and freight trains using the same track network.⁵⁷

The main problem area is between Sydney and Gosford, where congested tracks and enforced curfews have serious implications for freight shipments. They prevent movement at optimal times, limit flexibility, and the ability to recover from delays. The flow-on is poor reliability and competitiveness for rail freight. Similar problems south of Sydney will be helped when the new freight line opens.⁵⁸

Brisbane has some problems around Acacia Ridge and the Port but they are less significant than Sydney's problems. Melbourne, with a dedicated freight line, has no similar problems.⁵⁹

53 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.55.

54 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.55.

55 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.57.

56 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.57.

57 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.59.

58 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.59.

59 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.59.

Infrastructure Assessment

The Team was required to: outline current infrastructure investment plans and their timing and describe the planned works and the advantages to be gained. Determine the implications of the short listed route options, including costs, infrastructure needs and connections to ports and intermodal hubs.⁶⁰

ARTC is working through a planned improvement program worth \$1.67 billion on the existing coastal route. It is expected to be completed by 2009. It was adopted as the starting point for that part of the analysis.⁶¹

ARTC also expects that work to remove temporary speed restrictions will be complete by 2009 and the network will be running at design speeds. It also plans to overcome signalling problems by the introduction of in-cab signalling in the next five years. This will improve transit times and capacity across the network.⁶²

Although much of the proposed route would use existing track, there are areas where the condition of the infrastructure is far below the required Class 1 standard. The analysis has therefore included the work required to upgrade sub-standard existing track to connect new route options. Where wide or narrow gauge lines are to be used, the analysis has included provision to convert them to dual gauge.⁶³

Infrastructure - summary of key findings

Improvements to rail access arrangements at terminal and port facilities will also provide flow-on benefits to the interstate rail freight industry. This recognises that the amount of freight that can be captured on rail depends heavily on the capacity of the ports to handle it.⁶⁴

Sydney's existing intermodal network for containers will be subject to significant capacity restraints before 2020.⁶⁵

Brisbane's intermodal network is centred on Acacia ridge, where capacity will be improved by grade separating the existing level crossing at Beaudesert Road. If rail increases its share on the Melbourne Brisbane corridor, it is likely that greater intermodal capacity will be needed. Industry sources say that the

60 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.61.

61 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.61.

62 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.61.

63 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.63.

64 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.65.

65 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.65.

container throughput could be expanded from 380,000 TEU to a possible 750,000 TEU.⁶⁶

Melbourne's South Dynan terminal is the principal hub of Pacific National's interstate rail network, with total throughput of 680,000 TEU a year. There appears to be scope for expansion, but the terminal is limited to trains of 1,200 metres.⁶⁷

66 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.67.

67 Ernst & Young, et al, *North-South Rail Corridor Study Executive Report*, 30 June 2006, p.67.

