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Infrastructure Australia
GPO Box 594
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AUSTRALIA

Organisation:

Contact person: Dr Philip Laird

Postal address: SMAS University of Wollongong

State: NSW

Postcode: 2500

Country: Australia

Email address: plaird@uow.edu.au

Telephone: 02 4221 3421

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Author(s): P Laird

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Submission to Infrastructure Australia re the Brisbane Cairns corridor

Dr Philip Laird, FCILT, Comp IE Aust, University of Wollongong October 2008

Introduction

The accompanying submission was made during 2006 to the AusLink draft Brisbane-Cairns corridor strategy and was based on research conducted at the University of Wollongong. This research was supported, in part, by the former Cooperative Research Centre in Railway Engineering and Technologies (Rail CRC Project 24; rail transport energy efficiency and sustainability). Input also arose from earlier consulting for Queensland Transport. However, the views and research findings are the responsibility of the writer.

In 2008 the Rudd government released the 2007 revised corridor strategies. In some cases, the revised strategies address certain issues raised in submissions in the draft strategies.

It is suggested however that three issues warrant more attention than given in the final strategies in consideration of all candidates for Building Australia funding. These are:

- * reduction of total costs including external costs
- * reduction of carbon pollution, and
- * reduction of dependence upon imported oil.

Reduction of total costs including external costs

Rail is three times more efficient than road in using fuel to move freight. Rail also requires fewer drivers and it is of interest that in earlier in 2008, the Toll/QRX group shifted line haul Brisbane - Rockhampton freight from road to rail by reopening an older freight yard in Rockhampton,

External costs are conspicuous by their absence in many of the 2007 reports. This is despite the attention given to external costs as part of AusLink project assessment in the *National Guidelines for Transport System Management In Australia* released in 2004 by the Australian Transport Council. A second edition was issued in 2006. As these guidelines (at auslink.gov.au) "*focus on land transport and provide a standard framework, including processes, methods and tools to assist and guide transport planning and decision-making across Australia*" it is reasonable that external costs be fully taken into account in formulating recommendations for the funding of major projects.

Reduction of carbon pollution, and reduction of dependence upon imported oil

Since 2006, the case for reducing dependence on imported oil has been strengthened due to oil prices trending upwards. The lack of attention to oil vulnerability is perhaps the major deficiency in the revised 2007 corridor strategies.

Energy efficiency and oil vulnerability issues affecting the transport of people and freight are identified in a report released 7 February 2007 of the Senate Rural and Regional Affairs and Transport Committee from the Inquiry into Australia's future oil supply and alternative transport fuels. Recommendation # 7 of the 2007 report stated "*... that corridor strategy planning take into account the goal of reducing oil dependence ... Existing Auslink corridor strategies should be reviewed accordingly.*

This approach is commended as is the suggestion in the report *... a long term rise in the price of fuel ...may suggest a need to increase the pace of catchup investment in rail infrastructure.."*

Given rail's superior energy efficiency over trucks in moving line haul freight, it is suggested that more attention should be given by Infrastructure Australia to rail proposals that have demonstrated capacity to reduce dependence on imported oil. This will have the added benefit of not only reducing air pollution but also greenhouse gas emissions.

A recent paper

The conclusions of a recent paper of this writer "The Brisbane - Cairns Railway: building on success" given at the Australian Rail Summit in July 2008 at Sydney follow. The full paper can easily be made available on request.

Rails market share of at about 30 per cent on the Brisbane - Cairns corridor is about triple that on the Brisbane - Sydney and the Sydney Melbourne corridors.

Rail's superior performance on the Queensland North Coast line was only made possible by track upgrades of the 1980s in connection with Main Line Electrification, the Queensland Main Line Upgrade program of the 1990s and subsequent track upgrades. Without these upgrades, there would now be many more trucks on the Bruce Highway and a higher cost of living in Far North Queensland.

Work is nearing completion to duplicate Calboothure - Beerburrum on an improved alignment and should proceed without delay to Landsborough. Further upgrading of the Queensland North Coast line including track straightening from Landsborough to at least Maryborough West is now needed and should receive some Federal funding.

Attention is also needed to replacing older bridges including the Burnett River near Bundaberg and bypassing Rockhampton.

SUBMISSION RE BRISBANE CAIRNS CORRIDOR STUDY

Dr Philip Laird, University of Wollongong July 2006

1. Introduction

This submission will draw on research conducted at the University of Wollongong supported, in part, by the CRC for Railway Engineering and Technologies and three Rail Studies for Queensland Transport¹. However, the views expressed are those of the writer.

The AusLink concept, as introduced in 2002 and outlined in the 2004 White Paper is an important reform. However, AusLink faces strong challenges as recognised in the Senate Rural and Regional Affairs and Transport Legislation Committee's 2005 Report re AusLink. These include resisting any temptation to follow a 'Business as usual' approach and to one way or another favour road improvements at the expense of rail upgrades.

2. Oil supplies

There is a need to ensure that plans for future infrastructure can be modified if it is confirmed that high oil prices will be sustained (or continue to increase) as opposed to the scenario raised at the BTRE Colloquium held in June 2006 that within two years, oil prices will have fallen below \$US40 per barrel. However, oil pricing does not rate a mention in the study (even in Chapter 3 re foreseeable changes to 2030). It is recommended that future corridor studies consider:

Planning within a modified business as usual context (ie AusLink as per the White Paper).

Planning within the scenario of having to deal with sustained high oil prices.

3. Infrastructure pricing

The Brisbane - Townsville corridor study gives this important topic the briefest of mentions as a footnote on page 14 *"This includes road and rail infrastructure pricing regimes and freight vehicle access regulations."* More attention to this topic is warranted.

4. A special corridor

¹ The research findings and results of three Rail Studies released in 2003 by the Queensland Minister for Transport (the Smooth Running Study, the Straight Track Study and Land Freight External Cost Study) are not necessarily endorsed by Queensland Transport or other agencies. This submission also draws on two conference papers (available on request) *Rail track upgrading options to and within Queensland*, LL DCN Queensland Transport Infrastructure October 2003 and *Australian land transport - is it sustainable ?* (Laird, Adorni-Braccesi and Collett, November 2004) Towards Sustainable Land Transport Conference, Wellington, New Zealand.

The Brisbane - Townsville corridor study is of particular interest. This is not only because it is the first of many AusLink corridor studies but because of the corridor itself. Special features of the corridor include:

A. No funds (at least initially) were made available under AusLink in the first period (2004-2009) for a further upgrade the North Coast railway as part of a formal agreement between the Australian and the Queensland Governments.

This is despite AusLink being supposed to take a corridor approach, for example as stated by the Deputy Prime Minister Mr Anderson MP on 7 June 2004 that the Australian Government “*will fund projects on the transport corridors that have the greatest importance for Australia’s long term future, whether the projects involve road, rail ...*” also, that AusLink provides funds for the New South Wales North Coast line which only has half the traffic of the Queensland North Coast line.

B. The Caboolture - Nambour track is now probably the most congested section of single rail track in Australia. It was recognised as congested as long ago as 1994 in the BTCE report of the National Transport Planning Taskforce. This is shown by freight train curfews in peak hours, expanding the Brisbane Rockhampton electric tilt train transit time from 7 hrs to 7 hr 15 min in 2003, and, before then the introduction of the Caboolture - Nambour 'railway' bus.

C. The Corridor study recognizes (page 19) on the southern section an aim "to maintain freight capacity over the next ten years as commuter rail services increase. Projects include the duplication and realignment of the NCL from Caboolture to Beerburrum, followed by Beerburrum to Landsborough and then Landsborough to Nambour. However, it is of note (for example, as touched on in the 2004 Queensland Infrastructure Report Card of Engineers Australia), that this upgrade has been subject to considerable planning delays.

D. As recognized in the Corridor Study (page 17), some rail deviations have been constructed as part of NCL upgrades. In fact, this rail corridor stands out as an example of the notable achievement of dramatically improved performance resulting from track straightening undertaken during the late 1980s and the early 1990s. However, as noted (page 17 again) “... *the horizontal alignments and vertical grades between Nambour and Bundaberg remain poor and are a major impediment to attaining any further improvement in*

transit times and train length." The location of potential future deviations and town rail bypasses need more consideration.

D. A significant part of the Brisbane - Cairns railway is electrified (between Brisbane and Rockhampton), and, tilt train passenger services are offered. Indeed, this is the only rail corridor in Australia or indeed the Southern Hemisphere in which tilt train services are provided. However this is not recognized in the draft Corridor Study.

E. As noted on page 5 and page 9 of the Corridor Study, Queensland does have a Rail Network Strategy.

F. Queensland has some good examples of shared rail and road corridors. Examples on the Bruce Highway and Brisbane - Cairns railway includes a causeway built during the 1980s between Rocklands to Rockhampton.

G. A not so good example of a shared rail and road corridors is trains having to go down the middle of a road at a slow speed in North Bundaberg and north of the Rockhampton Station. (It takes one back fifty years).

H. Vehicle use on the Bruce Highway continues to be subsidized by the Queensland Fuel Subsidy Scheme, amounting to 8.1 cents per litre for fuel excise. The study on page 10 notes Bruce Highway Annual Average Daily Traffic of between 2,500 – 100,000 AADT, concentrated around urban centres. Assuming an average of say 10,000 vehicles per day by 2025 (Fig 4, p22) for its length of 1640 km and assuming each vehicle uses an average of 11 litres per 100km, an annual fuel use of about 660 million litres would result. The resulting subsidy to vehicle use on the Bruce Highway is then \$53 million per year.

I. The Brisbane - Cairns rail corridor is the only one of its length in Australia supporting the movement of livestock by rail.

J. The use of narrow gauge track on the corridor (imposing some costs of moving rail freight between Queensland and other states).

5. The need for improved advanced planning

Planning is given some mention in the Corridor Study, for example on page 7 (list of Short-term Priorities (to 2015) to determine, where supported by the community, future needs and route preservation requirements for road and rail town bypasses.

It is suggested that future Corridor Studies should give much more attention to route preservation. In the case of Queensland, the following is of note.

A. Despite the single track between Caboolture and Nambour in all likelihood being the nation's most congested section of rail track, identifying and protection of a new rail corridor for duplication on improved alignment has proved difficult and time consuming.

After much consultation and planning, an Option 2 route for a Caboolture – Landsborough duplication with deviations was on public exhibition to December 2003. On 15 January 2004 the Queensland Government decided not to proceed with Option 2. The attendant delays and ongoing rail congestion imposes an ongoing cost to efficient rail freight and passenger train operations. These delays include restrictions on freight train movements during peak hours and the use of a 'railway bus' between Caboolture and Nambour whose use for some scheduled services leads to a 2 hr 30 min train journey between Brisbane and Nambour (enough to discourage anyone from using public transport again).

There is a need to expedite Caboolture – Landsborough duplication on an improved alignment, and, to expedite planning and corridor protection for Landsborough - Nambour duplication and desirable rail deviations north of Nambour.

B. It took from 1996 to 2004 for Queensland Rail and Queensland Transport, to identify a new rail crossing of the Toowoomba and Little Liverpool Ranges, assess environmental impact, and finally protect a corridor from Grandchester to Gowrie. This was done in the full knowledge that it may take 20 to 30 years to construct the new route. It was also recognised that the existing route has severe operational (speed-weight) constraints, and, is in need of replacement.

C. The Queensland Transport Minister, The Hon Paul Lucas MP (as quoted, Track and Signal, Oct-Nov-Dec 2005, page 77) has noted the need to “*reserve rail corridor land before it becomes a costly issue*”. Such a view could have usefully been expressed in the Brisbane - Cairns corridor study.

6. Rail deviations

Along with duplication and deviations of the Caboolture - Landsborough - Nambour section, other desirable Queensland North Coast line deviations include:

- A. Selected rail deviations between Nambour and Bundaberg.
- B. Selected (but fewer in total length) rail deviations between Bundaberg and Cairns.
- C. A western bypass to go with a new bridge over the Burnett River at Bundaberg which is currently subject to a speed restriction of 15 km/h with no braking or acceleration. The speed restriction used to be 25 km/h. In addition, in North Bundaberg, the trains have to go down the middle of a road at a slow speed. Obviously, a new rail bridge on a new alignment is needed.
- D. A rail freight bypass to the west of Rockhampton Station where north of this station, trains move along the centre of Denison St at 25 km/h (noted as 15 km/h in 1998). Again, a new rail bridge (over the Fitzroy River) on a new alignment is needed.

The Brisbane – Townsville line may be regarded as a vital extension of the Defined Interstate Rail Network. Some straightening and strengthening of the track was done during the late 1980s (as part of Main Line Electrification) and during the 1990s with Main Line Upgrade or MLU. However, as noted above and in the Corridor Study "*the horizontal alignments and vertical grades between Nambour and Bundaberg remain poor and are a major impediment to attaining any further improvement in transit times and train length.*"

Selected rail deviations² can give appreciable benefits and include:

1. Reduced point to point distance,
2. Faster and heavier freight trains,
3. Improved reliability of freight train operations,
4. Improved rail passenger services,
5. Appreciable savings in fuel and brake wear to train operators,
6. Reduced track maintenance costs,
7. The potential for elimination of level crossings, flood mitigation, and improved clearances,

² 2006 Laird P *The Sydney - Melbourne Rail Corridor - options for the 21 st Century* Australian Rail Summit, July, Sydney

8. Reduced road accidents involving heavy trucks due to rail's expected increase in modal share,
9. Reduced diesel use and greenhouse gas emissions due to rail's superior energy efficiency in line haul freight (a factor of about three to one), and,
10. The ability of an upgraded rail system to defer considerable expenditure on the augmentation of road capacity

Quantification of some of the benefits for potential deviations in NSW (Main South and NCL) and Southern Queensland are given in a recent paper.³ An outline of the 1990's MLU project, and compelling reasons for proceeding with it, were given by the Project Manager, Mr Ross Hunter⁴ *"Without substantial upgrading, the quality of rail freight services possible could not keep pace with the quantum improvements enjoyed by our major competitor, road transport. Rail would continue to lose market share, compounding the losses from having to retain services. The Mainline Upgrade Project is targeted at improving services and picking up market share, and reducing the costs of providing these services to enable rail to compete more effectively on price."*

The additional traffic includes freight trains bringing Queensland fruit and vegetables to Acacia Ridge for moving on by rail to the Sydney and Melbourne markets. The value of MLU in improving reliability was emphatically made by Mr Bob Scheuber, CEO of Queensland Rail when speaking at AusRail Plus on 24 November 2005. To quote from notes made at the conference: The success of Queensland's MLU was that *"...not only was there more efficiency of train movements but it dramatically reduced derailments with 100km/h trains with an increase in reliability*

6. More on rail deviations

In 1998, Queensland Rail produced a Straight Line Diagram (S24480) identifying 237 deviation sites between Brisbane and Cairns. Of these, 174 deviation sites were between Landsborough and Townsville. The number of deviations where the indicated speed restrictions are less than 100 km/h for freight trains between Landsborough and Townsville to 135. This would require reconstruction of some 290 km or track, and give for a heavy freight

³ 2005 (P Laird M Michell, A Stoney, and G Adorni-Braccesi) *Australian freight railways for a new century* AusRail Plus

⁴ Hunter, R. (1994) *Queensland Rail's Mainline Upgrade Project*, Tenth International Rail Track Conference Proceedings, pp 107-115

train time savings estimated at about 137 minutes, and fuel and other cost savings for train operators of about \$2600 per trip⁵. This is about 20 per cent of the total operating cost of the train if it could sustain 100 km/h through running for the entire haul. In addition, saving in track maintenance costs of about \$200 would result for each standard freight train trip between Landsborough and Townsville. In addition, for each tonne of line haul freight a more competitive rail operator could attract, external transport costs would conservatively estimated to reduce by approximately \$17 per tonne⁶.

As part of a Rail CRC project, further analysis was undertaken for five potential NCL rail deviations between Nambour and Maryborough West. Indicative and partial results are given in Table 1.

Table 1 Indicative results for selected NCL rail deviations

Section	Approx starting point km	Distance saved km	Time saved min	Fuel saved litres
Landsborough - Nambour (part only)	104	1.8	7	38
Nambour-Yandina	111	0.2	2	7
Nandroya-Traveston	152	1.7	14	63
Woondum-Glanmire	167			
Gympie Nth-Kadina	194	0.3	3	7
Kanyan-Maryborough West	262	1.4	15	55
Total		5.4	41	173

Reference: Indicative track file data supplied by Queensland Rail, with Simtrain computer simulation by Mr M Michell of Samrom Pty Ltd of a freight train with one QR 4000 class (or PNQ PN loco) with a 2000 tonne trailing load and average time and fuel savings in both directions.

The average time saving for the electric tilt train traversing the new track in either direction was found to be 57 minutes.

7. External costs

External costs are also conspicuous by their absence in the report. This is despite the attention given to external costs as part of AusLink project assessment in the *National*

⁵ See *The Smooth Running Study* as one of the three Rail Studies released in 2003 by the Queensland Minister for Transport

⁶ For updated estimates of external costs, see, for example, Laird (2005) *Revised Land Freight External Costs In Australia*, Australasian Transport Research Forum (ATRF) at patrec.org

Guidelines for Transport System Management In Australia released in November 2004 by the Australian Transport Council. External costs were also addressed in the ARTC Track Audit ⁷ which gave unit estimates for "... noise pollution, air pollution, greenhouse gas emissions, congestion costs, accident costs, and incremental road damage costs" for road and rail freight in both urban and non-urban areas. These unit estimates were recently revised (Laird, 2005, loc cit) as 2000 costs of 2.75 cents per ntkm for road haulage in urban areas, 1.98 for road haulage in non - urban areas, 0.43 for rail haulage in urban areas, and 0.17 for rail haulage in non - urban areas. These costs, adjusted to 2005 values (at 3 per cent pa) are approximately 3.2 cents per ntkm for road haulage in urban areas, 2.3 for road haulage in non - urban areas, 0.5 for rail haulage in urban areas, and 0.2 for rail haulage in non - urban areas.

The current Auslink report notes a Brisbane- Cairns road distance of 1640 km and a rail distance of 1699 km. Assuming urban hauls of 40 km for each line haul mode, the external cost for each tonne of road hauled intercity freight is about \$38.10 as against \$3.50 per tonne for rail line haul. If a total of 40 km is assumed for urban road pick up and delivery for each rail line haul the estimated external cost is an extra \$1.30 per tonne. This suggests that, for intercity freight moving between Brisbane and Cairns by line haul rail and road pick up and delivery diverted to road line haul, with road pick up and delivery, there is a net increase of external costs of about \$33.30 per tonne.

As noted in the Brisbane- Cairns corridor strategy, in considering future rail freight demand three scenarios are examined: Base case – rail captures 95% of its current mode share, Market defence – rail captures its current mode share, and Rail growth – rail captures 105% of its current mode share. It would be of assistance if the external costs for each of the three scenarios could have been evaluated using AusLink preferred unit values for external costs.

The cost to both Queensland and the nation if the base case (or worse) eventuates will be high. It will include appreciably more heavy trucks on the Bruce Highway, with increased imported oil use, road accidents, air pollution, and road system costs.

8. General comment

During the 1990s, Queensland Rail (QR) invested approximately \$2 billion in new and upgraded track. This previous investment has assisted QR today in moving more than 160

⁷ Australian Rail Track Corporation (2001) Booz.Allen and Hamilton Appendices *Interstate Rail Network Audit*,

million tonnes of coal a year and about 20 million tonnes a year of other freight. Investments during the 1990s such as the Main Line Upgrade of the North Coast line have allowed for faster and heavier freight trains along with the introduction of passenger tilt trains.

However, QR is now facing problems in generating funds for upgrading its track network. Part of the reason is National Competition Policy and financial strictures imposed by both the Federal and Queensland governments.

As a result of National Competition Policy, Queensland Rail, via its Network Access Unit, is obliged to offer use of its tracks to third party operators such as Pacific National. In order to retain its large coal contracts, QR is obliged to offer increasingly lower freight rates. The BHP Matsui coal contract is understood to cost Queensland Rail over \$100 million in foregone revenues in 2004-05 rising to \$200 million per year thereafter. Whilst savings like this can be delivered with increased efficiency and staff output, the reality is that a source of funds available for projects like the NCL Main Line upgrade of the early 1990s is no longer present.

The second pressure on QR is that present State Government arrangements through Queensland Transport effectively require Queensland Rail to have to go further into debt to raise funds for track upgrades. This, coupled with risks imposed by 'open access' to its tracks, acts as a disincentive to QR to invest in track such as the NCL.

The third factor is that in the past, with the exception of some earlier urban transport funds, the Federal Government has put almost all of its Queensland land transport funds into roads. This has been continued with the AusLink 2004-09 funds initially going to roads. As a result, a case can be made that QR now suffers from a "Triple Whammy" effect in obtaining funds for major track upgrades.

AusLink in theory was supposed to address such problems and provide a more balanced approach between investment in roads and rail track. As indicated in this submission, the present Brisbane - Cairns corridor strategy needs improving to give a better balance.