Contents

1 Infrastructure Access Prices in the North-South Rail Corridor

1.1 Overview

The price of access charged to train operators for use of rail infrastructure –access prices-have implications for revenue and volumes, and hence for return on investment. Although there are "standard industry rates" for the existing north-south rail line, there is a range of options for a possible inland route. This appendix assesses those options and the related regulatory framework for access to rail infrastructure on Australia's interstate network. It also discusses road user charges and their likely future impact on potential rail freight volumes and rail access prices. It concludes by identifying the more realistic rail access prices for inclusion in demand modelling and hence in financial and cost benefit analysis possibilities.

Interstate rail access charges are market-based (constrained by road competition) and structured as a two-part tariff. The charges typically comprise a flag-fall per train kilometre, and a use charge per thousand gross tonne kilometre (GTK). On the existing coastal route in the current north-south corridor the combined effect is an average of $2.70 - $3.70 per thousand GTK, depending on the sector and train length. After allowing for the weight of the wagons and the carriage of empties, the implied cost per net tonne kilometre (NTK) is 0.6 – 0.8 cents. The charges are subject to regulatory arrangements, which at present provide for annual reductions of CPI-2% or two thirds of CPI, whichever is greater. This rate of reduction is not judged to be sustainable over the 25 year period of the North-South Rail Corridor Study (the Study), and the Study Team's modelling of future outcomes assumes it will to become more modest.

Road user charges consist of an annual registration fee and a portion of fuel excise. The current road user charges established by the National Transport Commission's (NTC) Second Determination imply a charge per NTK of approximately 1 cent per NTK for B-Double trucks which increasingly are becoming the main competitor for interstate rail freight.[1] The charges are adjusted annually to reflect road expenditure allocated to road used by heavy vehicles (above 4.5 tonnes in weight). During the 25-year period covered by the Study, the likely introduction of vehicle positioning technology will allow a change to more sophisticated charges based on truck type and design, axle numbers, mass, distance, type of road and (for congestion) time of day. It will then be possible to remove the current cross subsidy to B-Doubles, and to allow much heavier trucks (paying higher total charges but less per NTK) on the better roads. The timing and magnitudes are unknown, so a default assumption is a continuation of the long-term trend of a real reduction per NTK of 0.5% per annum.

Assuming current access arrangements continue for the existing rail and road routes in the current north-south corridor, access charges for a possible inland route can be considered. As access charges influence the freight rates train operators charge end customers, market outcomes are influenced significantly by the level at which access charges are set. Higher rail access charges on a possible inland route would deliver higher revenue per GTK but, beyond a certain point, would reduce revenue as freight diverted to the existing rail coastal route or to road transport. The possibilities are captured in a range of scenarios for a possible inland route between Melbourne and Brisbane:

1. Increased rail access charges, compared with those now charged by the ARTC, so that the average end-to-end cost per tonne for an end customer on this shorter route would be the same as on the existing route.

[1] A proposed Third Determination, which would have increased most changes and changed some relativity (including a lower cross subsidy to B Doubles), was not approved.

2. Rail access charges intermediate between floor (avoidable cost similar to operations and maintenance costs) and ceiling (full cost recovery including capital costs) for example, 25% higher than on the coastal route.

3. A market-based access price designed to produce a door-to-door average a rail freight market price 10% below the average road freight price, the difference being required by the lower service quality of rail freight. This also produces rail freight prices 10% higher than on the existing coastal route, again justified by differences in service quality.

4. A variant of 3, with access charges set to produce door-to-door freight prices that are the same as for road freight, on the more optimistic assumption that the service quality will be close enough not to matter.

5. Estimates of revenue maximising changes:

- One based on the Study Team's survey and analysis of demand responsiveness to price and service quality; and
- One based on assumed road freight prices

Access prices ruled out as unrealistic for a possible inland route were:

- Current access charges on the existing coastal route on a $/GTK basis. Access charges of this nature would produce a lower price per tonne for a better route (compared with the coastal route), which is not plausible.
- "Floor charges", rail access charges applied to other route options to cover operating and maintenance costs (similar to the regulatory floor of avoidable costs) plus a proportion of joint overheads. As much of a new inland route would be new or reconstructed track with low operating, and maintenance costs and as its length would be shorter, such a scenario would provide access prices lower than on the existing coastal route. This is not plausible given the high construction cost and the superior standard of service offered.; and
- Rail access charges that recover full economic costs including capital. Such charges are not feasible, as all traffic would divert to the existing coastal rail or to road.

The paper concludes with estimates of revenue and of rail freight market share for each scenario, which are reflected in the chapters on ***Demand Analysis*** and ***Financial and Economic Analysis***.

2 Introduction

The purpose of this paper is to examine current and expected future charges for rail and road infrastructure, and the consequences for rail freight revenue.

Train operators on interstate and similar routes in Australia generally pay for their use of rail infrastructure with market-based access charges. The size of these charges is limited by road freight competition and access regulations. The market based access charges do not recover their full economic costs on any interstate route in Australia. Rail access charges typically include a flag-fall per train kilometre and may include a variable charge per gross tonne kilometre (GTK). Truck and bus operators pay for their use of road infrastructure with a fixed charge and an annual registration fee.

Rail access charges are the major determinant of revenue for infrastructure owners, through both the direct revenue effect and the indirect effect on customer demand for rail services. Road user charges have an impact on rail infrastructure revenue through the competitive effect on rail freight demand. Hence rail access charges, and relative rail/road charges, will have a substantial impact on the financial and economic evaluation of the investment options in the North South Rail Corridor (the Corridor).

The brief for this project does not seek advice on what rail access charges (or road user charges) should be, but it will be important to explore the possibilities in order to understand the economics and possible funding implications of different options.

The rest of this paper consists of sections on current and future rail access charges, and on current and future road user charges, followed by assessment of the number of scenarios that cover the possible combinations. These scenarios form an important input into the Study Team's modal share modelling presented in the chapter on ***Demand Analysis***.

3 Rail Access Charges

Interstate train operators' access to and use of Australian Rail Track Corporation's (ARTC's) rail infrastructure is charged using a flag-fall and gross tonne kilometre charge. In addition, State regulatory arrangements mandate the terms and conditions of access arrangements to other rail infrastructure in Queensland, Western Australia and the Northern Territory. These terms include variations on the fixed and variable structure.

The main infrastructure providers relevant to the Corridor are the ARTC, RailCorp and QR. Current charges are summarised in the table below[2]:

Table 1 - Access charges for the Victorian, NSW and Queensland sections of the Corridor (2005/06 prices)

	Melbourne – Albury	NSW interstate line (excl Sydney area)	Sydney Area (est.)	NSW border – Acacia Ridge Queensland
Flag-fall $ / train km	1.65	0.38 – 0.46*	0.50**	1.31
Usage $ / 000 GTK	2.275	2.24 – 3.1	4.40**	2.94

** plus $0.05/train km for each 100m of train length over 750m or 900m, depending on the sector.*

*** these are estimates of RailCorp's access charges*

Note: These access charges are for 'high' level services with 110km/hour speed limits with 21 tonne axle loads

Sources: ARTC website (http://www.artc.com.au/about/reference.htm), QR website (http://www.networkaccess.qr.com.au/Images/Interstate_tariffsJan_2006_tcm10-10721.pdf) and confidential data from rail and track operators

The combined effect of the flag-fall and variable charge, averaged over the GTKs carried, is $2.70 - $3.60 per thousand GTK, depending on the sector and the train length. This implies an average of 10% flag-fall and 90% variable on the North South corridor, compared to 20-30% flag-fall and 70-80% variable charge on the east west corridor.

On average, aggregated train and track operator data shows that combined forward and backhaul GTKs are about 2.2 times NTKs (the difference being the weight of the wagons and locomotives) for a combination of non-bulk commodities, steel and empty containers. The charge per thousand NTK is therefore about $6 - $8 per thousand NTK (i.e. 0.6 - 0.8 cents per NTK). Charges of this magnitude allow the ARTC to recover network operating and maintenance expenditure and its fixed overhead costs but only recover a small proportion of its full capital costs.

At present the ARTC adjusts its charges each year by the greater of CPI – 2% or 2/3 of CPI, resulting in a real reduction in rate year on year.

[2] Source: www.artc.com.au, www.qr.com.au and rail operator data.

Revenue from the access charges are used to cover infrastructure operating and maintenance costs, fixed overhead costs and to make a contribution towards capital expenditure. The capital expenditure upgrades and capital replacements include the current AusLink and ARTC programs to upgrade the current north-south route. The ARTC is expected to make a future return on only part of this investment and with the remainder regarded as “sunk” in economic terms.

The rail access charges on ARTC’s interstate network are subject to regulatory arrangements and principles stipulated in Part IIIA of the *Trade Practices Act 1974* (TPA) (discussed in Supplement A.).[3] The arrangements, in common with others elsewhere in Australia, require the ARTC to charge access between a “floor price” that is slightly higher than avoidable cost and a “ceiling price” of full economic “stand-alone” cost. On interstate routes, such as the North South rail corridor, charges are close to the floor because of price competition from road transport. This means that in the long-term there would be insufficient revenue to finance asset replacement, but the ARTC policy is to grow volume and eventually achieve long run sustainability. On heavily used coal routes such as the Hunter Valley, rail access charges are close to the ceiling.

The ARTC does not expect that its real annual price reductions (specified above) will be sustainable over the 25 year horizon of this project, and that at some point it will move to more modest or zero reductions; the timing and the amount of change are not yet known and will depend on a number of factors including future volume growth, increased rail reliability and efficiency, and road transport competition, and regulatory approval.

[3] The ARTC is yet to submit an undertaking to the ACCC relating to its NSW network. Until such time track access charges for its NSW network is being increased at CPI minus 2% from charges previously set by IPART.

4 Road User Charges

4.1 Overview

Road user charges are established by agreement between jurisdictions under the umbrella of the National Transport Commission (NTC). They consist of an annual registration fee and a portion of fuel excise.

The long term trend is that road user charges, expressed in terms of cost per NTK, have declined by 0.5% per annum in real terms.

Over the past three years the NTC's Annual Adjustment Procedure has increased nominal price increases for registration by:[4]

- 2002 3.2%[5]
- 2003 3.0%
- 2004 0.3%

Revenue from heavy vehicle charges covers the operation and maintenance of the road system, and future capital expenditure. This is known as the pay-as-you-go basis; "….it is assumed that current expenditure provides a reasonable proxy for annualised cost of providing and maintaining roads for the current vehicle fleet."[6]

The NTC's proposed charges in its Third Determination were recently rejected by the Australian Transport Council (ATC). The proposed charges would have increased registration charges for heavy vehicles with nine axles or more by 37% (gradually introduced over 2006 and 2007) and increased net diesel excise by 2.1 cents per litre. The current charges in the Second Determination and the proposed charges from the Third Determination for articulated and B-double trucks – the type of vehicle most relevant to competition with interstate rail services on the North South corridor – are outlined below in Table 2.

Table 2 - Road user charges in the NTC's second and proposed third price determinations

	2nd price determination (with annual adjustment to 2005)	3rd price determination (prices assumed to have existed by 2007)
Annual registration charge, 6 axle semi-trailer	$4,783	$4,830
Annual registration charge, 9 axle B double	$7,565	$10,410
Net diesel excise	20 cents per litre	22.1 cents per litre

[4] The Annual Adjustment Procedure is essentially either the road expenditure index or the CPI, which ever is lower.

[5] Source: BTRE staff

[6] NRTC (predecessor to the NTC) *Updating Heavy Vehicle Charges* September 1998

Source: NTC second and third price determinations

4.2 Cross subsidies

Averaged over the fleet and the regions, heavy vehicle charging recovers the costs of the damage heavy vehicles cause to the Australian road network.[7] However the charges for different types of trucks do not accurately reflect their relative damage costs. NTC analysis shows lighter heavy vehicles to be over compensating for their road damage while the heavier vehicles (i.e. B-doubles and road trains) are under compensating by approximately 10% or over $100m per annum.[8] B-doubles receive an average cross subsidy of between $5,500 and $7,500 per annum from other heavy vehicles, namely rigid heavy vehicles which over recover their costs.[9] To correct this cross-subsidisation the NTC recommended that B-doubles' registration increase by 37% and net diesel excise increase by 2.1 cents per litre in its Third Determination. Under the Third Determination a typical B-double (9+ axle) rig would have had an allocated cost of 1.2 cents per NTK but the current road user charges in the Second Determination only imply a charge of 1 cent per NTK.[10] [11]

The trucking industry considers the operating cost base for B-doubles and road trains would be between 3.2% and 7% higher with the Third Determination whereas the NTC estimated it to be 1.8% higher.[12] [13] The Study Team's modelling indicates that the Third Determination would have increased total operating costs by approximately 1.3%.

As B-double trucks have become a major competitor with interstate rail services on this corridor, COAG's rejection of the Third Determination has implications for price competition between road and rail services on the North South corridor. A complete assessment would also need to consider:

- The lower impact of trucks on the high durability roads (such as the Hume Highway);
- The allocation of 'common' or 'non-separable' costs; and
- The treatment of capital costs, and externalities.

These issues are beyond the terms of reference for the Study, but will be reviewed in the Productivity Commission inquiry.

---

[7] The NTC defines a heavy vehicle as commercial vehicle above 4.9 tonnes of gross capacity

[8] NTC's RIS on the NTC's 3rd price determination, and ARTC submission in response

[9] *Draft Regulatory Impact Statement Summary for the Third Heavy Vehicle Pricing Determination*, National Transport Commission, October 2005.

[10] Source: *Third Heavy Vehicle Road Pricing Determination Draft Regulatory Impact Statement,* National Transport Commission October 2005, pages 21 and 41, on http://www.ntc.gov.au/DocView.aspx?page=A02412300500020020

[11] Another issue not covered in this project, is the allocation of 'non separate' costs, or costs that are common to both cars and trucks. The NTC allocates them mainly to cars, wile some other countries have a larger relative allocation to trucks. There are obvious implications for road/rail competition.

[12]Rollins A., *States to block road to higher truck charges,* The Australian Financial Review, p 7, 16 March 2006.

[13] http://www.ntc.gov.au/filemedia/general/SummaryRegulatoryImpactStatement.pdf

4.3 Vehicle positioning or mass distance charging

The NTC currently has a consultancy under way to examine the possibilities for a major change in the way road user charges are levied on heavy vehicles. By using vehicle positioning technology (satellites, gantries etc) it would be possible to better tailor the charges to individual trucks – their designs, weights, distances travelled, type of road used, etc.[14] This provides a basis for removing the distortion that currently favours some of the larger trucks and trucks using lower durability country roads. Moreover, it would also be a basis for allowing much heavier trucks (those meeting certain design criteria) provided they pay much higher charges.

The net effect is expected to be lower road user charges per net tonne kilometre on the routes road freight uses to compete against rail freight in this corridor as:

- The greater efficiency of higher payload trucks derived from economies of scale will outweigh the higher road user charges applied to them, otherwise they would not be used; and
- Trucks using the high durability roads between Melbourne, Sydney and Brisbane would likely incur lower road user charges than charges which assume trucks use roads of average durability.

The timing and extent of these changes is not yet known, but is expected to be well within the 25 year horizon of the Study.

A future decision by the ATC to increase in road user charges for B-double trucks to eradicate cross-subsidies from smaller trucks would partially or fully offset these potential reductions in road user charges. Thus, the net change in road user charges for B-doubles and road trains from these opposing movements remains unclear. On demand analysis assumes a continuation of the past trend of a slow (0.5% p.a.) decline in charges per NTK.

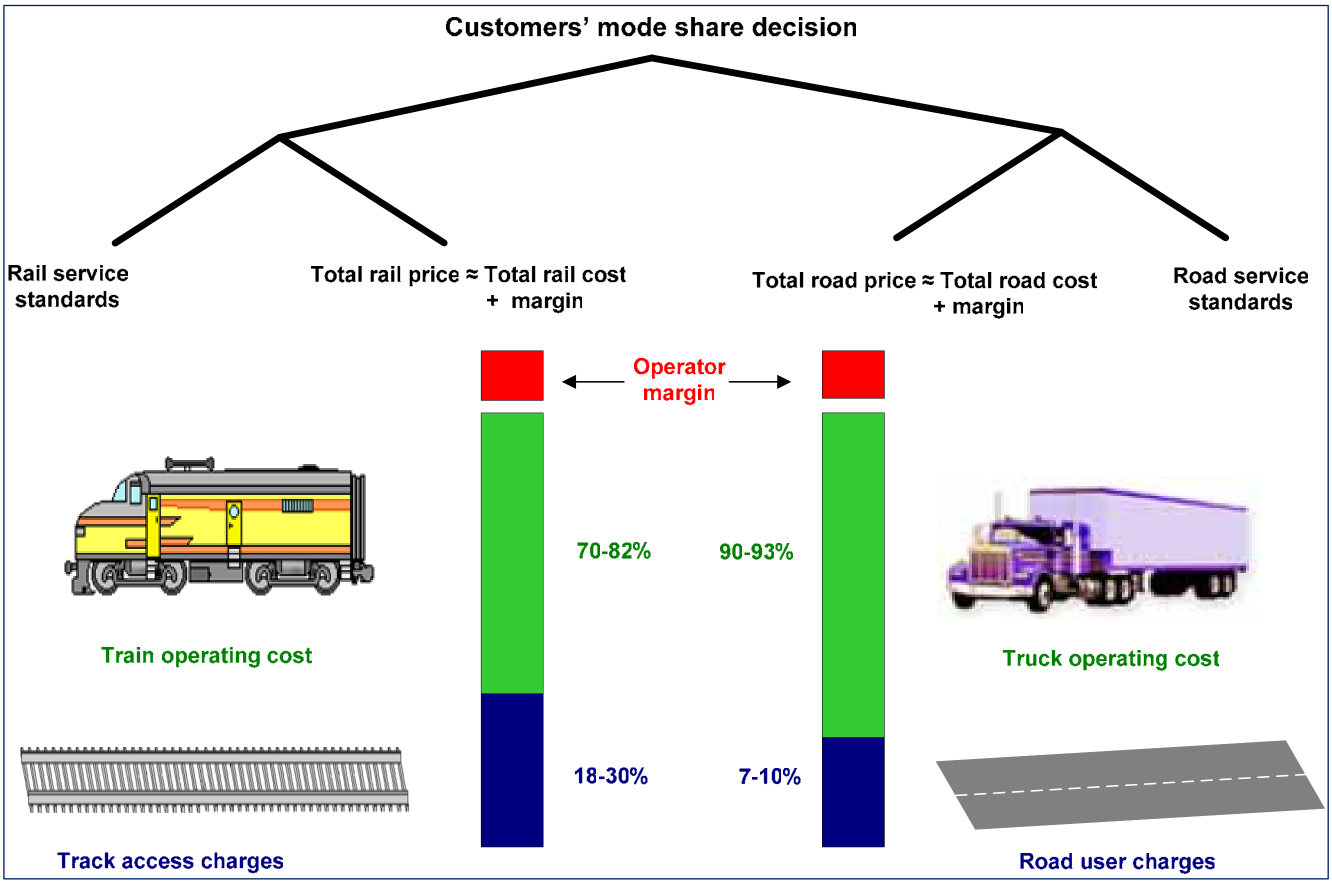
[14] We note, however, it is still to be determined whether the benefits of vehicle positioning technology outweigh the costs associated with its implementation.

4.4 Interaction between rail and road charges

The relative charges for use of rail and road infrastructure affect the end freight costs charged to customers and the competitiveness of rail versus road freight. Both need to be borne in mind when estimating infrastructure revenue prospects for different route options in the Corridor. The extent of the impact will be incorporated into the Study Team's demand analysis.

The relative impact of track access charges and road user charges on end customers' modal decisions are shown in Figure 1.

Figure 1 - The relative impact of track access charges and road user charges on end customers' modal decisions



Note: Operator margin refers to both a freight forwarders' margin (if one is used) and/or the commercial margin of the truck or train operator (which could be included as capital costs in truck or train operating costs)

The impact on land mode shares from changes in rail access or road user charges is unlikely to be proportional. Trucks usually have higher operating costs per NTK than trains, and road user charges comprise a smaller proportion of their operating costs than access charges do of rail operating costs.[15] Road user charges amount to approximately 7-10% of

[15] This is despite road having higher road user charges (1.0 cents per NTK) than rail access charges (0.6-0.8 cents per NTK).

road freight's total operating costs (for 6 axle articulated semis and B-doubles) and access charges are roughly between 18-30% of rail's total operating costs.[16] Thus an increase in rail access charges has a larger impact on rail's total operating costs and hence prices, than the same percentage increase in road user charges does on road's operating costs.

An increase in rail access charges will increase the infrastructure provider's revenue on a per gross tonne kilometres (GTK) basis. The likely response, however, from users of rail services would be to reduce the volume of freight they send by rail, or at least by that rail route if there is another choice of route. The effect of which would reduce number of GTKs carried on an inland route. The opposite applies to a price reduction.[17] The interaction between an inland route and the existing (coastal) rail route, and between north-south rail and road routes, expressed as cross elasticities, will determine the volume decrease in response to an increase in the cost of freight services.[18]

In practice the scope for different levels of access price on an inland route is constrained by ARTC access price policy on the existing coastal route and by current and future road user charges. For example, an excessively high access charge on an inland route would push traffic back onto the coastal route or onto road; this limit is explored in one of the scenarios below.

A common feature of both the road and rail access arrangements is that at present they do not allow for external costs imposed on others, such as greenhouse emissions, other pollution, noise, the non-insured (pain and suffering) aspects of accidents, and congestion. Generally these are lower per NTK for rail than for road (and are even lower for sea transport)[19]. Future pricing may allow for externalities, but there are practical difficulties as the size of external cost varies by location – they are low in parts of countryside where few people live (including most of the North South inland corridor), and higher in towns.[20]

---

[16] Another reason for the difference is that rail operators pay all infrastructure operating and maintenance costs, whereas 70% 'non-separable' or common road costs are paid by cars. These figures vary depending on the length of the route and the applicable access arrangements.

[17] This is the price elasticity of demand, a percentage change in demand for a good or service in response to a percentage change in price for that good or service. Usually the price elasticity is negative -- a price increase causes a reduction in demand, and a price reduction causes increased demand.

[18] The cross elasticity of demand for a rail route is the response of demand on that route to a change in price of a competing service (eg a road service or a competing rail route). Usually cross price elasticities are positive -- a price increase on one service causes a demand increase (from diversion) on a competing service.

[19] The exceptions include very lightly loaded or lightly patronised train services where a truck or bus may have lower externalities (because of a higher load to tare ratio), some curved track where there is 'wheel screech', and the low frequency rumble from idling locomotives waiting at crossing loops.

[20] For further discussion, see Bureau of Transport & Regional Economics, Working Paper 40 - *Competitive neutrality between road and rail*, 1999; ACIL Consulting, *The Role of Rail in Sustainable Transport* (on the environmental impacts of different transport modes), for the Standing Committee on Transport (through Transport SA) 2001; Australian Transport Council *National Guidelines for Transport System Management in Australia,* 2004

5 Access Pricing Scenarios

5.1 Introduction

These effects are now explored in several scenarios for future rail access pricing, principally on an inland route although the arguments are relevant to a major (Hawkesbury area) upgrade of the existing route. Each represents an obvious point on a spectrum from low (being current ARTC rack rates) to high (full cost recovery). Revenue- maximising scenarios are also set out, with increases beyond a certain point constrained by competition from the existing coastal route or from road freight.

As noted above, it is not within the brief for the Study to recommend what the road and rail infrastructure charges should be; the scenarios are simply for the purpose of exploring sensitivities[21].

The Productivity Commission will undertake an Inquiry to determine the full financial and economic costs of providing road and rail infrastructure and identify the optimal methods and timeframes for introducing efficient road and rail freight infrastructure pricing. The review is intended to assist in implementing efficient pricing of road and rail freight infrastructure through consistent and competitively neutral pricing regimes.[22] The outcomes may impact on the scenario.

Access prices are incorporated in the dynamic programming in the Study. Forecasts of rail access charges form part of rail's supply curve, which help determine the equilibrium price of rail services (where the modelled demand and supply curves intersect). Forecasts of road user charges will help predict future total road prices in the Study Team's modal modelling. An implicit assumption is that all increases in rail access charges and road user are passed onto freight customers – in other words, that the existing above rail and above road freight markets are price competitive. In practice, there may be some (limited) ability of train operators to absorb some of the access charge in an effort to improve market share.

To avoid unnecessary complexity, each access charge scenario is assumed to apply throughout the 25 year period of assessment. In practice it is possible that access arrangements will change over the period. For instance, the ATC may implement a mass-distance charging regime in its next price determination in four to six years time.

5.2 Annual adjustments over the forecasting period

The Study Team assumed that the access arrangements for the existing rail and road routes in the North South corridor continue with annual access charges for rail growing slightly. The proposed route options were also increased by the same annual growth factors as the coastal route. Table 3 shows the assumed levels of growth of rail access charges and road user charges.

---

[21] The views of rail and road interests on this issue, and the views of other parties, are set out in submissions to the NTC's third determination, on www.ntc.gov.au. A Bureau of Transport and Regional Economics assessment is found in their Working Paper 57, *Land Transport Infrastructure Pricing* 2003. Government views are contained in the *Auslink White Paper*, DOTARS 2004.

[22] http://www.treasurer.gov.au/tsr/content/pressreleases/2006/007.asp

Table 3 - Assumed future annual growth rates for road user charges, the coastal rail route and a proposed route option

	Road user charges	Coastal rail route	Proposed route option
2004-09	2% (nominal) or -0.5% (real)	0.5% (real) or -2% (nominal)	-
2010-19	2% (nominal) or -0.5% (real)	1.5% (nominal) or -1% (real)	1.5% (nominal) or -1% (real)
2020-2029	2% (nominal) or -0.5% (real)	2% (nominal) or -0.5% (real)	2% (nominal) or -0.5% (real)

5.2.1 Rail

The annual adjustment mechanism to forecast access charges from 2004 to 2029 on the existing coastal route and possible inland route have been based on the following assumptions:

- Incentive regulation under Part IIIA of the TPA – implying access charges will decrease in real terms by a nominal efficiency target (x) to incentivise more efficient below rail operations;
- CPI-x will be used as the annual adjustment mechanism;
- A CPI rate of 2.5% (midpoint between the RBA's stated range of 2-3%); and
- The nominal efficiency target, 2% will decline over the forecasting period, as it will become harder to achieve further improvements as the changes get lower. We have assumed an annual adjustment of CPI-2% until 2010 CPI-1% from 2010 to 2020 and CPI-0.5% from 2021 to 2029.[23]

5.2.2 Road

The historical trend for heavy vehicles is that road user charges, expressed in terms of cost per NTK, have declined by 0.5% per annum in real terms. This trend is assumed to continue, especially with no clear guidance on the future direction of road user charges prior to the PC's Inquiry findings.

---

[23] Effective access charges have declined significantly on the rest of the ARTC's network as its tariff structure on this route collects between 20 and 30 of total revenues from flag-fall charges and this proportion has declined as trains became longer. The tariff structure on the North South corridor has a 10% flag-fall and will not produce similar affective tariff reductions.

5.3 Access changes on a possible inland route

In this section we discuss a range of possible access charges for the existing coastal route and potential inland route options.

For the purposes of forecasting future demand and revenue in the North South corridor the Study Team used four simple access charges to apply to possible inland routes. The options are set out in Table 4 and assume train operators pass through the additional access costs to customers in terms of higher per tonne prices.

Table 4 - Access charges on existing and possible inland route on the Melbourne-Brisbane corridor

	Roundtrip market price ($/tonne)	Roundtrip access cost ($/tonne)	Access charges ($/000gtk)	Increase above existing route ($/000gtk)
Existing road price	$180	$14.50	-	-52%
Existing coastal rail price	$150	$30	$2.80-$3.20	-
Scenario 1	$150	$30	$4.01	34%
Scenario 2	$157.50	$37.50	$5.02	67%
Scenario 3	$165	$45	$6.02	101%
Scenario 4	$180	$60	$8.02	167%

Note: These are indicative prices. Coastal route is 1,954 km in length between Melbourne and Brisbane and the proposed inland route would be approximately 1,700 km in length.

Note: Round trip prices have been used to avoid the large discrepancy in freight rates charged to customers in both directions so that access prices can move freely without appearing to unduly influence operator margins by too little or too much in each direction.

Source: Industry sources from the Study Team's market research

1. The scenario was to set the total cost of access of proposed route options equal to that of the coastal route, per tonne. This established an access charge 34% higher on the shorter proposed routes than the coastal route on a $ per thousand gross tonne kilometre (GTK) basis.
2. The second scenario has the total roundtrip cost of access for a possible inland route arbitrarily being 25% higher on an end-to-end per tonne basis than that on the coastal route (or 67% higher on a $/000gtk basis).
3. The third scenario was based the rail price to customers being 9% lower than the road freight rate to compensate for an inland route's lower service standards.
4. The fourth scenario was to increase the roundtrip cost of access to equate the market price of $180 for road and rail services from Melbourne to Brisbane. This represented a 167% increase in access charges over the coastal route on a $/000gtk basis.

Table 5 shows revenue is likely to be highest under these conditions with access charges lower than scenario 1 ($27.5 million) or between scenarios 1 and 2 ($25.1 million).

Table 5 - Annual Revenue derived from Melbourne- Brisbane freight with Inland Route Price scenarios 1-4, no efficiency gains

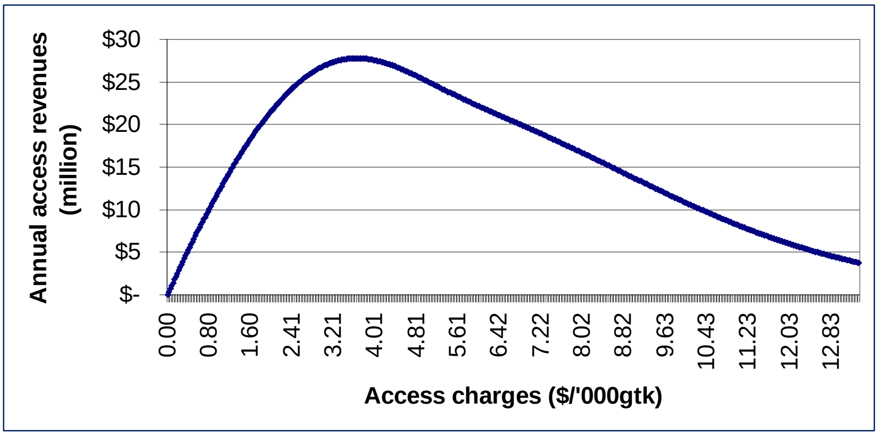
Scenario	Market Share %	Access charges $/'000gtk	Round trip access charge ($/tonne)	Round trip Market price ($/tonne)	Annual access revenue in 2009
1	53%	$4.01	$30.00	$150.00	$27.5m
2	41%	$5.02	$37.50	$157.50	$25.1m
3	34%	$6.02	$45.00	$165.00	$22.1m
4	23%	$8.02	$60.00	$180.00	$16.7m

A fifth access charge – designed to maximise revenue of a proposed route option – has also been estimated. Higher rail access charges on an inland route would deliver higher revenue per GTK but, beyond a certain point, would reduce revenue as freight diverted to the existing rail coastal route or to road transport. The maximising net revenue for the rail sector lies between scenarios 1 to 4; its exact position is determined by the relative service standards.

- Access charge scenarios ruled out as unrealistic for an inland route were:
- Rates equal to a floor price of operational plus maintenance expenditure. These costs would be low because much of the line would be new or rehabilitated, yet the service quality and capital cost would be high.
- Full recovery of capital costs. Such rates would be likely to deter most traffic

The relationship between annual revenues from the proposed route and access charges is shown below in Figure 2. It shows that annual revenues peak at around $27.8 million, corresponding to an access charge of approximately $27.4 per tonne or $3.66/’000gtk. It assumes that access prices are passed onto customers, but that operator efficiency gains (from using as shorter and less congested route) are not. This assumption of train operator pass-through of operating costs advantages from operating costs on the existing coastal route is expanded upon below.

Figure 2 - Annual revenue and access charges for Melbourne-Brisbane freight on an inland route



The combination of shorter transit distance and improved infrastructure is likely to lead to lower train operator costs than the existing coastal route from Melbourne to Brisbane (and return). If efficiency gains from the shorter route are passed on to the customer by train operators in terms of lower prices there is a further increase in the rail market share and hence higher access revenues are generated.

The effects are combined in Figure 2 consolidated with the Study Team's mode share model described in the chapter on ***Demand Analysis***. Figure 3 shows access revenue on an inland route with no cost advantages for train operators over the existing route, and then 5, 10, 15 and 20% cost advantages over the existing route. The underlying assumption in this analysis is that train operators pass through the cost savings to end customers.

Figure 3 - Access charge revenue on an inland route from Melbourne-Brisbane freight 2009

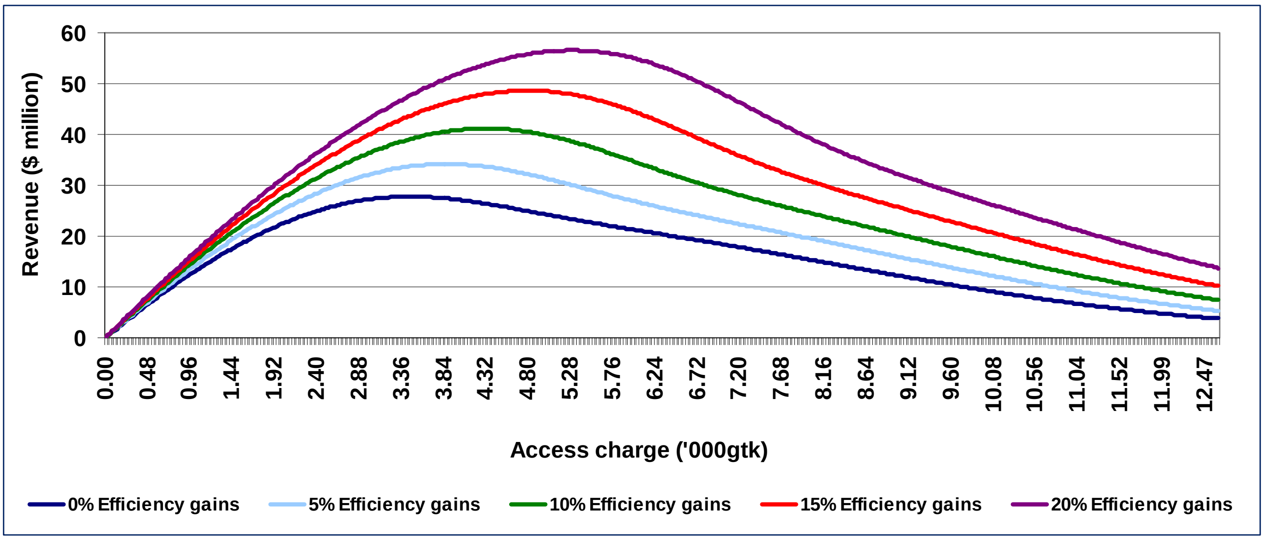


Table 6 shows the revenue maximising access charge for cost efficiency gains to train operators on an inland vis-à-vis the existing coastal route ranging between 0% to 20%.

Table 6 - Revenue maximising access charges for a given level of train operating cost savings on an inland route over the existing route

	0%	5%	10%	15%	20%
Maximum revenue	$27.8m	$34.2m	$41.2m	$48.7m	$56.6m.
Access charge $/'000GTK	$3.66	$4.09	$4.57	$5.08	$5.59

The revenue maximising charge ranges from $3.66 per '000/GTK to $5.28 per '000/GTK. Access charges of this magnitude are approximately 22% to 86% above average access charges found on the existing coastal route. On an end-to-end basis, the access charges in Table 6 ranged from $27 to $42 per tonne. The corresponding access revenue for total Melbourne-Brisbane return freight ranged between $27.8m and $56.6m, depending on the level of cost savings available from an inland route relative to the train operating costs on the existing coastal route.

6 Conclusion and Input to Modelling

The revenue for any of the infrastructure options in the North South rail corridor is determined by rail access charges and volumes of traffic. The volumes of rail traffic are determined by the competitiveness of rail freight compared with other modes, which in turn is partly determined by relative road and rail access charges. The competitiveness of rail freight on one route is also affected by rail access changes on any alternative route.

It is assumed that the ARTC's charges on the existing route continue, though with less annual reduction than in the past. These charges, and road user charges (which have had a long term downwards trend per NTK), limit what could be charged on an inland route.

The most relevant inland route charging scenario for inclusion in our demand modelling are charging so that the cost per tonne is the same on the shorter inland route as on the existing route and charging to maximise access revenue.

The relevant scenarios will be incorporated in the Study Team's modelling of future modal shares, in the form of extra runs to show the sensitivity of the results to different access prices. The specific data used and assumptions made will be set out in the chapter on ***Demand Analysis***. The sensitivities will provide a basis for discussion of future charging policy in the context of North South rail corridor options.

7 Supplement A: The Regulatory Framework

Access on Australia's rail networks is subject to Part IIIA of the Trade Practices Act 1974 (TPA). Part IIIA provides three mechanisms for ensuring access on appropriate terms:

- NCC declaration under the Act which effects a "negotiate/arbitrate" arrangement for access with the ACCC as arbiter of disputes;
- ACCC acceptance of an access undertaking; or
- NCC certification of a State regime.

Under a recent Bill, the TPA was amended to allow the Commonwealth Minister to provide pricing principles. These principles are to be used by the ACCC in its decisions regarding access disputes and undertakings.

The NCC is responsible for declaring facilities under Part IIIA and for certifying state arrangements as compliant with the requirements of the TPA. The ACCC is responsible for arbitrating disputes over access to declared facilities and assessing undertakings provided by the facility owners or operators. The State regulators IPART (NSW), the ESC (Victoria), the ERA (Western Australia) and the QCA (Queensland) have traditionally been responsible for administering the State access arrangements applying to the respective interstate rail networks[24] in their State.

At present the ACCC is responsible for regulatory judgements on access for most of the interstate east-west corridor (from Albury and Broken Hill through Melbourne and Adelaide to Parkeston). With the ARTC assuming control of the interstate network in NSW, the ACCC will assume the access responsibilities previously undertaken by IPART.

Given that the ACCC will mandate the terms and conditions of access to the majority of Australia's interstate track, this appendix focuses on the pricing principles endorsed by the ACCC and underpinning its decision of the ARTC access undertaking decision.

7.1 ACCC Pricing Principles

7.1.1 Guide to Part IIIA

The ACCC sets out what it views as the "available approaches" to access pricing in undertakings in its publication "Access Undertakings – A guide to Part IIIA of the Trade Practices Act". These are:

- Specification of prices – for example in the form of a price list or a list with pricing methodology.
- Maximum and minimum prices, expressed either explicitly or in terms of the basis on which they would be set.
- Reference prices, based on the efficient costs of providing the reference service. This then provides a benchmark for other services provided by the infrastructure operator.
- Menus of prices – relevant only where there is a two part tariff (eg different flag-fall and GTK components). Under a menu access seekers can choose between high up-front fee and low volume fees (which would suit established operators) or vice versa (which would suit newcomers). The composition of fixed and variable fees

[24] ESCOSA have a regulatory role under the negotiate/arbitrate access regime on the Adelaide to Darwin line if the access seekers and providers cannot reach commercial agreement.

may not adjust the overall cost of track access but may provide important incentives/signals to operate heavier (higher fixed component) or more efficient operations depending on the tariff structure. ARTC also use multi-part tariffs on the east-west route but we will not consider multi-part tariff structures in this paper on the Corridor.

The ACCC also discusses a range of ‘practical models for pricing’, including the cost of service approach, price caps, two part tariffs and the efficient components pricing rule (ECPR – defined below).

7.1.2 ARTC Access Undertaking

The ACCC indicates that it will assess access pricing arrangements on a case by case basis. However, to date the only adjudication/assessment of access charges undertaken by the ACCC has been from their assessment of the ARTC undertaking.

ARTC’s access charging approach as approved by the ACCC incorporated floor and ceiling tests (see below) for the revenue extracted from the network. This requires that the revenue derived from a segment or group of segments be no less than the incremental cost (or avoided cost) and no greater than the full economic (or “stand –alone”) cost of providing the service.

Only a portion of infrastructure maintenance expenditure was directly identified ‘voidable’ for specific track segments. The remaining maintenance expenditure together with operations expenditure was allocated to segments according to cost allocation rules identified in the Undertaking. ARTC also made an allocation of joint overheads. Thus the cost floor is somewhat above a true “avoidable cost” floor (where true avoidable costs include only those costs that could be avoided if traffic on one specific route or segment was to be discontinued).

Full economic cost is defined to include all costs attributable to the provision of a service over a segment, and is comparable to the “building block” methodology used by regulators to arrive at a revenue ceiling for a regulated utility. Thus economic cost includes:

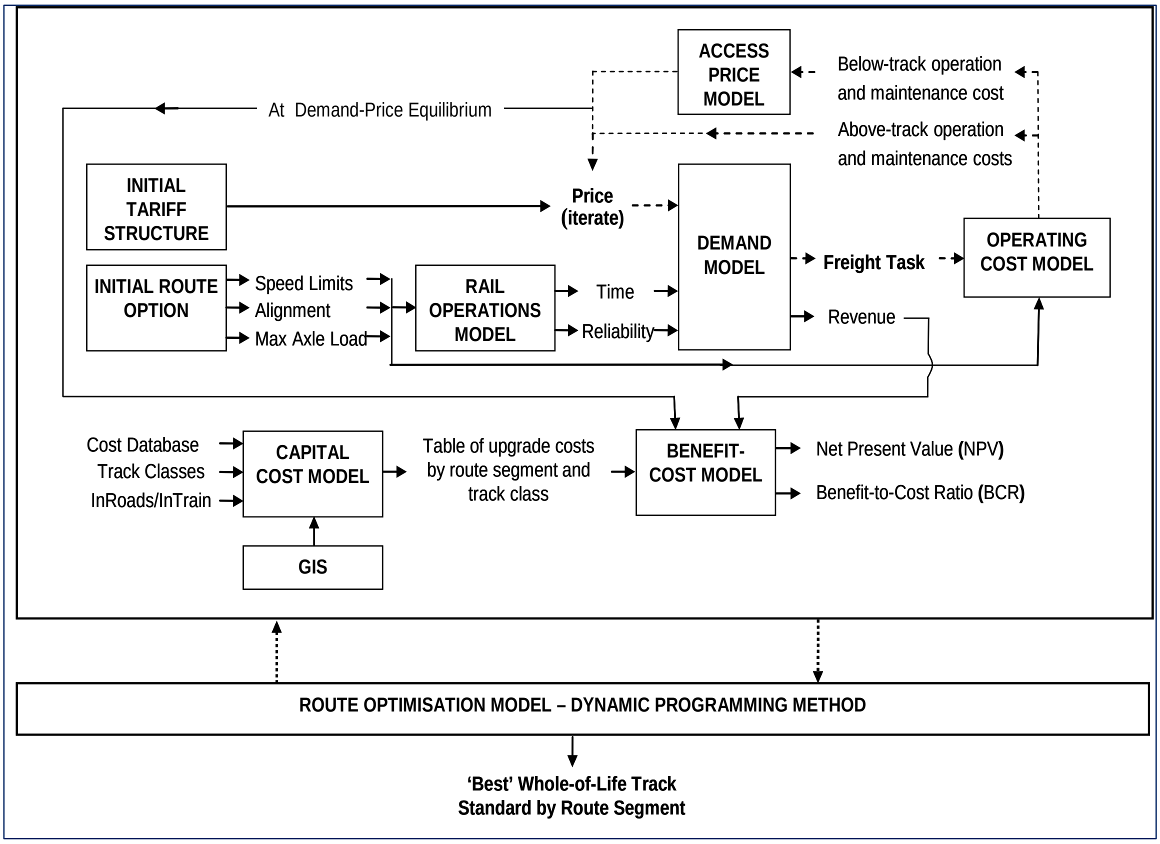
- Costs specific to a segment;
- The costs of additional capacity;
- Depreciation;
- Return on segment-specific assets; and
- An allocation of overhead costs.

Generally a price close to, but not at, the floor is charged for lightly used lines such as rural grain lines and most of the interstate line. By contrast full economic cost is generally the basis for charges on heavily used lines, mainly coal lines, reflecting a greater willingness to pay. The eventual rehabilitation of lightly used lines thus requires a substantial increase in traffic volume or government grants, though this may not become necessary for decades as the infrastructure has a long economic life. The alternative is not to continue these line operations but rely on road transport once substantial replacement or periodic maintenance becomes necessary.

The Undertaking specifies indicative access charges by segment, for a service having the characteristics of a 21 tonne axle load, maximum speed of 110km/hr and an average speed of 80 km/hr and a length not exceeding 1,500 metres east of Adelaide and 1,800 metres west of Adelaide. The charges, which are market-based and not cost-reflective, are levied in two parts: a fixed flag-fall which is based on train length, and a variable component which is levied on the basis of gross mass and distance.

In addition, the Undertaking specifies that over term of the Undertaking, the maximum variation to indicative access charges will be the maximum of CPI-2% or two thirds of CPI, whichever is greater. Access charges must also be non discriminatory as between freight operators in the same market.

8 Supplement B: Schematic Diagram of Dynamic Programming



This page intentionally blank