Rail

# Tarcoola to Darwin Railway: 5-year Review of Revenues 2013-14 to 2017-18

## Final Report

March 2022

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# Glossary of terms

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|---|---|
| AARC | The AustralAsia Railway Corporation. |
| Above-rail | Operations involving rolling stock / trains. |
| Access provider | A party providing, or able to provide, rail infrastructure services – sometimes referred to as a below-rail operator. |
| Access seeker | A party seeking access to below-rail services. |
| Below-rail | Refers to the railway infrastructure facilities and services; not the trains themselves. |
| Code | AustralAsia Railway (Third Party Access) Code, contained in the Schedule to the Act |
| Commission | Essential Services Commission, established under the *Essential Services Commission Act 2002* |
| Concession deed | The concession deed covers the rights, responsibilities and obligations of the concession holder (One Rail Australia (North)) and the South Australian and Northern Territory Governments. |
| DORC | Depreciated Optimised Replacement Cost, which represents the cost of replicating an asset in the most efficient way possible from an engineering perspective, less accumulated depreciation. |
| ESC Act | *Essential Services Commission Act 2002.* |
| KGTK | Thousands of gross tonne kilometres, a measure that combines distance and weight in rail haulage (GTK is equal to gross weight multiplied by distance). |
| Schedule | The schedule to the Code outlines the access pricing principles, including access pricing in connection with freight services, access pricing in connection with passenger services and worked examples. |
| TEU | Twenty-foot equivalent unit, a widely used metric for measuring containerised freight. |

# 1 Executive summary

The Essential Services Commission (**Commission**) has conducted a five-year review of the revenues earned from third party access to below-rail (rail infrastructure) services on the Tarcoola to Darwin rail line. It has determined that, based on the Depreciated Replacement Optimised Cost (**DORC**) asset value adopted in this review, the relevant below-rail revenues have not been excessive.

The review was undertaken in accordance with the AustralAsia Railway ('Third Party Access') Code (**Code**), a schedule to the *AustralAsia Railway (Third Party Access) Act 1999 (SA)* and the *AustralAsia Railway (Third Party Access) Act 1999 (NT)*. Under Clause 50(4) of the Code, the Commission must, for five-year periods, review below-rail freight revenues where no sustainable prices exist. It must determine if those relevant revenues are excessive, having regard to the factors outlined in the Code.

It is common when regulating monopolies to assess the revenues earned. The methodology for this periodic review of revenues is a comparison of the revenues earned for below-rail services, where no sustainable competitive prices exist (that is, where potential alternative transport services do not provide an effective constraint on below-rail prices on the Tarcoola to Darwin rail line), against an estimated maximum (or monopoly) revenue limit for those same below-rail services. The maximum limit is calculated based upon the requirements of Clause 50 of the Code, noting these provide the Commission with some discretion in the approach adopted. Should revenues earned be considered excessive, the Commission must take regulatory actions, as outlined in Clause 50 of the Code.

In October 2021, the Commission published a draft report for public consultation, outlining its methodology and draft findings in relation to the revenues earned. The draft report found that, irrespective of the cost allocation methodologies adopted in the review, excessive revenues did not appear to have been earned over the period 1 July 2013 to 30 June 2018. One submission to the draft report – from access provider, One Rail Australia (North) – was received in response.

## 1.1 Excessive revenues have not been earned for the period 1 July 2013 to 30 June 2018

The Commission's final finding is that, based on the DORC asset value adopted in this review, excessive revenues have not been earned over the period 1 July 2013 to 30 June 2018. The finding is based on the following evidence:

- The weight, volume and distances involved in transporting mineral ore freight on the Tarcoola to Darwin freight route tends to favour rail transport over road. Stakeholders report that this freight has continued to be transported on rail with no apparent switching to road. Below-rail services for the transport of mineral ores are therefore determined to be *not* subject to sustainable competitive prices, so the revenues earned from these services were included in the five-year review.
- The revenues earned for below-rail services for the transport of mineral ore were approximately $106.2 million (in December 2014 dollars) for the period from 1 July 2013 to 30 June 2018. Both cost allocation approaches used in this report resulted in maximum revenue limits above actual revenues ($186.4 million and $387.3 million (in December 2014 dollars) respectively).

The results are highly sensitive to the asset valuation, the cost allocation methodology and the rate of return adopted. As a result, the final report presents sensitivity analysis for various key parameters, including for those highlighted as concerns by One Rail Australia (North). The results of the sensitivity analysis indicate that the revenues earned were still well below any of the possible maximum revenue limits calculated.

## 1.2 The Commission will proceed with its intended discussion paper in 2022-2023 on the topic of asset valuation

In its submission, One Rail Australia (North) raised concerns regarding the planned discussion paper on the topic of asset valuation, expressing the view that a departure from the use of a DORC value would not be consistent with the Code and Schedule. The Commission remains of the view that there is benefit in exploring the topic of asset value methodologies and as such will proceed with its intended discussion paper in 2022-2023. The discussion paper process will allow One Rail Australia (North), as well as all other stakeholders, the opportunity to submit evidence and views on the topic of asset valuation.

# 2 Purpose and scope of review

## 2.1 Purpose of review and legislative framework

The Essential Services Commission (**Commission**) is the regulator of the third party access regime that applies to below-rail (rail infrastructure) services on the Tarcoola to Darwin rail line, established under the *AustralAsia Railway ('Third Party Access') Code* (**Code**).[1] The Code sets out a framework for commercial negotiation between a provider of access to below-rail services (**access provider**) and an end-user seeking to access those infrastructure services (**access seeker**). The Code includes dispute resolution processes and arbitration as a regulatory backstop should commercial negotiations fail.

Clause 50 of the Code requires that the Commission review, for five-year intervals, below-rail freight revenues where no sustainable prices exist (that is, where potential alternative transport services do not provide an effective constraint on below-rail prices on the Tarcoola to Darwin rail line). The purpose of the review is to determine whether the revenues earned by the access provider have been 'excessive' having regard to factors outlined in Clause 50 of the Code.

When regulating monopolies it is common to assess the revenues earned.[2] A lack of effective competition for the provision of rail infrastructure with monopoly characteristics can allow the access provider to set prices above efficient costs for certain below-rail services.

Importantly, the review of revenues for the Tarcoola to Darwin rail line can reveal whether certain regulatory action or oversight may be required. Should below-rail revenues be determined as excessive, the Commission must notify the access provider of the outcome, consider any remedial plans put forward by the access provider, and, if necessary, make a determination to regulate prices and/or establish conditions relating to prices or price-fixing factors in future.[3,4]

This review of revenues is the second undertaken by the Commission. It is for the period 1 July 2013 to 30 June 2018. The previous review was completed in 2015, covering the period 15 January 2004 to 30 June 2013. It concluded that the relevant revenues earned were not excessive.[5]

The legislative framework for the revenue review requires that the Commission:

- reviews actual revenues earned for below-rail freight services where no sustainable competitive prices exist
- takes into account revenues earned from both awards by arbitrators and from commercially negotiated access contracts
- compares actual revenues against the efficient costs of providing those same below-rail freight services, and

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1 The Code is a schedule to the *AustralAsia Railway (Third Party Access) Act 1999 (SA)* and the *AustralAsia Railway (Third Party Access) Act 1999 (NT).*

2 National Competition Council, *AustralAsia Railway Access Regime – Application for Certification under Section 44M(2) of the Trade Practices Act*, Final Recommendation, February 2000, p. 66.

3 Code, Clause 50(8).

4 The importance of the revenue review was highlighted in the Commission's review of access pricing guidelines published in October 2019 in which it stated that *'[a] key question… is whether or not… [One Rail Australia (North)'s] pricing approach is leading to monopoly rents and, if so, is greater pricing oversight required, to the extent permitted under the Code?'* See Commission, *Review of rail guidelines for the Tarcoola-Darwin railway*, October 2019, p. 11, available at https://www.escosa.sa.gov.au/ArticleDocuments/1061/20191029-Rail-ReviewRailGuidelines-Tarcoola-Darwin-FinalDecision.pdf.aspx?Embed=Y.

5 Commission, *10-year review of revenues – Final report*, August 2015, pp. 1-43, available at https://www.escosa.sa.gov.au/ArticleDocuments/365/20150828-Rail-Tarcoola-Darwin-TenYearReviewOfRevenues-FinalReport.pdf.aspx?Embed=Y.

- determines efficient costs by applying an objective and appropriate methodology, which has regard to investment in all railway infrastructure, applies an appropriate commercial return (accounting for the project risk at the time of construction, development and operation),[6] and takes into account the avoidable costs and a reasonable contribution to fixed costs from access holders (users) of the rail infrastructure.

An extract of Clause 50 of the Code is in Appendix A.

## 2.2 Legal structure, ownership and operation of the Tarcoola to Darwin rail line

The Tarcoola to Darwin rail route comprises approximately 824 kilometres of rail line (including track and signalling systems) from Tarcoola to Alice Springs that opened in 1980, and approximately 1,415 kilometres of line (including track and signalling systems) from Alice Springs to Darwin that opened in 2004 (Figure 1).

Construction of the Alice Springs to Darwin rail line was a greenfields project aimed at furthering economic progress in the north of Australia (conceived as a "land bridge" to connect Australia with overseas markets). As a result, there was considerable demand risk at the time of construction, even despite government contributions to the rail infrastructure.[7]

The Commonwealth Government, the South Australian Government and the Northern Territory Government contributed funding in approximately equal portions for the construction of the Alice Springs to Darwin line, totalling approximately $559 million (in nominal terms).[8] Those contributions reduced the risk exposure on the project funds contributed from the private sector investors.

In March 2000, the access regime was certified as effective for a period of 30 years until 31 December 2030.

The current access provider of below-rail services on the Tarcoola to Darwin rail infrastructure is One Rail Australia (North), formerly Genesee & Wyoming Australia (North). Genesee and Wyoming Australia (North) purchased the right to operate the rail infrastructure in 2010 for a total cost of $334 million (in nominal terms). The rail infrastructure was previously operated by FreightLink, a company that entered into administration in 2008.

One Rail Australia (North) leases the right to operate the rail infrastructure under the 50-year AustralAsia Railway Project Concession Deed (**Concession deed**). Parties to the Concession deed are One Rail Australia (North), the AustralAsia Railway Corporation (**AARC**[9]) and the Governments of both South Australia and the Northern Territory.

The Concession deed specifies the rights, responsibilities and obligations of the parties involved. The deed ceases in 2054. Although government contributors did not require a financial return on the investment, they require that the physical assets be returned when the lease expires.

The AARC is responsible for promoting and monitoring that rail infrastructure be maintained in a fit for purpose condition. The AARC undertakes regular maintenance reviews to promote compliance in this regard.

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6 Code, Clauses 50(5)(c), 50(5)(d), 50(6) and 50(7).

7 National Competition Council, p. 1, and Commission, *Tarcoola-Darwin Railway: Regulated Rates of Return*, Provisional Determination, 2003, pp. 40-41.

8 AARC, *Annual Report 2002-03*, p. 11.

9 The AARC was established in 1997 to build the Alice Springs to Darwin segment of the rail line. In 2000, the AARC awarded the contract to design, construct and operate the rail line under a build, own, operate and transfer arrangement to the Asia Pacific Transport Consortium (APT). FreightLink was awarded the contract to operate below-rail services from APT. APT was the holder of the concession deed prior to Genesee & Wyoming Australia (North).

## 2.3 End users of the rail infrastructure

The Tarcoola to Darwin rail line is used, in part or in its entirety, by several key end users (Table 1).

Table 1: Key end users of the Tarcoola to Darwin rail line over period 1 July 2013 to 30 June 2018

| End user | Period of use | Transported good or service | Segment of rail line utilised |
|---|---|---|---|
| **Bulk freight** | | | |
| OM Manganese | 2013-14 to 2017-18 | Manganese ore | Muckaty to Darwin (Berrimah) |
| OZ Minerals | 2013-14 to 2017-18 | Copper ore | Wirrida to Northgate BP (Tarcoola) and some smaller volumes from Wirrida to Tennant Creek[10] |
| Territory Resources | 2013-14 to 2014-15 | Iron ore | Union Reef to Darwin (Berrimah) |
| CU-River[11] | 2016-17 and 2017-18 | Iron ore | Wirrida to Northgate BP (Tarcoola) |
| Southern Iron[12] | 2013-14 to 2017-18 | Iron ore | Wirrida to Northgate BP (Tarcoola) |
| **Intermodal freight** | | | |
| Various customers[13] | 2013-14 to 2017-18 | Intermodal (containerised) freight | Tarcoola to Darwin (Berrimah) |
| **Passenger** | | | |
| Individual customers | 2013-14 to 2017-18 | Passenger | Tarcoola to Darwin (Berrimah) |

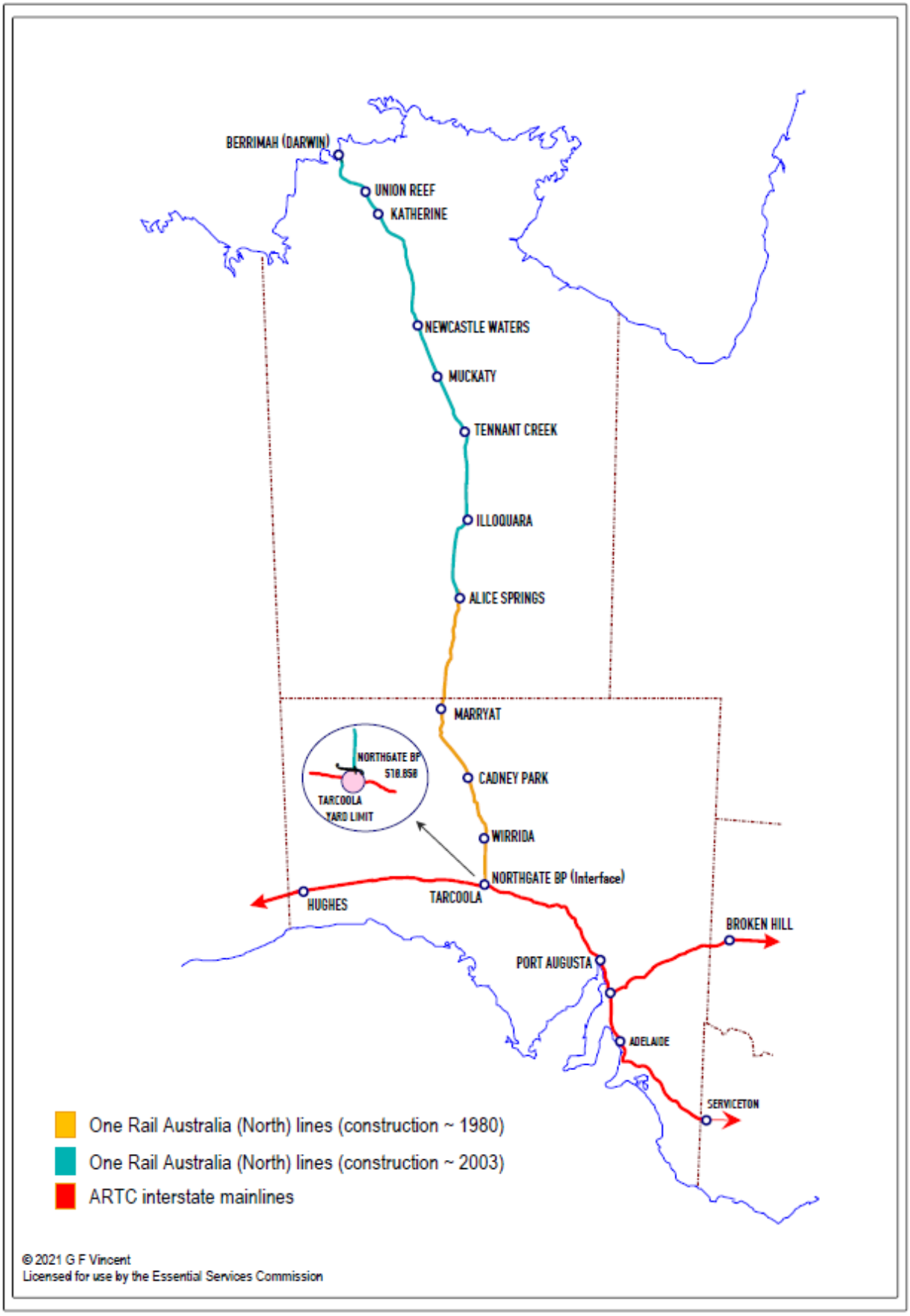
[10] OZ Minerals uses both the Wirrida to Tarcoola rail line, and lines from Wirrida to Tennant Creek. When measured as the gross weight of the trains involved, between 2014-15 and 2017-18, approximately 80 to 90 percent of OZ Minerals' rail transport travelled south from Wirrida to Tarcoola.

[11] Specialised Bulk Rail Pty Ltd (known as SBR) transported mineral ore for the Cairn Hill mine in 2013-14. The Cairn Hill mine was purchased by CU-River in 2014.

[12] Although outside of the current review period, it is noted that during 2012-13 Southern Iron moved approximately two-thirds of its output northbound from near Wirrida to Darwin.

[13] Examples include freight forwarders and the Australian Government.

Figure 1: Map of Tarcoola to Darwin rail line



## 2.4 Contextual considerations of the Clause 50 review of revenues

The Code's scope covers various aspects, one of which is the review, for five-year intervals, of revenues earned by the access provider for the provision of below-rail services on the Tarcoola to Darwin rail line where no sustainable competitive prices exist. That review of revenues has a distinct purpose: to determine whether the relevant revenues earned are excessive, in the context of the various requirements specified in Clause 50.

It is important to identify and distinguish various Code requirements at the outset of the review, including those which are mandatory.

- Throughout the review the operator's costs will be assessed as to whether they are efficient.
- The relevant required railway infrastructure is defined as the portion of the rail infrastructure required from the access provider in order to provide the relevant below-rail services to the access seeker.
- The revenues reviewed are only those earned for below-rail services where no sustainable competitive prices exist and were earnt under either access awards made through the Code's arbitration processes and/or access agreements commercially negotiated between the parties.[14]

In determining whether revenues are excessive, the regulator must have regard to various factors (including but not limited to):

- The review requires that efficient costs be measured against the actual revenues earned by the access provider.
- The regulator must have regard to investment in all rail infrastructure and all revenues earned by the access provider for the provision of below-rail services.
- The regulator must adopt a reasonable contribution to fixed costs from all other access holders (not just those where sustainable competitive prices exist), in accordance with the method outlined in Clause 50(4) of the Code, and it must be combined with avoidable costs attributable to usage by all other access holders, and then subtracted from the costs for access seekers where no sustainable competitive price exists.
- When having regard to the appropriate commercial return on the rail infrastructure, the appropriate risk premium must be based on the expected risks prevailing at the date of commencement of construction of the rail infrastructure.[15] In respect of any expansion of the rail infrastructure, the appropriate risk premium must be based on the expected risks prevailing as at the commencement of that expansion. Furthermore, when having regard to the appropriate commercial return, the relevant financial market rates (the risk free rate and the rate of inflation) are those prevailing at the time of the regulator's review.
- For the purposes of determining the appropriate risk premium, the regulator must have regard to the information provided by the access provider with respect to any contents of any financing plan of the access provider.

An important aspect of the Clause 50 review is that it allows the Commission's review to adapt as circumstances change (subject to the requirements of the review imposed under the Code). Within the context of the Clause 50 requirements, there are certain aspects of the review that allow for some

[14] To date, no awards have been made under arbitration.

[15] The date of commencement of construction is not defined in the Code but is used within the Code and the Schedule to the Code, as a reference date at which the Commission is to assess the prevailing *ex ante* risks.

discretion on the part of the regulator having regard to relevant matters or circumstances, when undertaking the revenue review.

These aspects, among others, relate to various methodological issues for: valuing capital assets; determining the expected risks prevailing at the commencement of the construction of the rail infrastructure; determining the risk free rate and rate of inflation; determining the methodology for calculating the value of regulatory depreciation, determining the portion of the rail infrastructure required by access seekers (noting that the regulator must have regard to investment in all of the rail infrastructure); determining (if the maximum contribution to fixed costs is not reached) the methodology for estimating a reasonable allocation of fixed costs across access holders (noting that the regulator must have regard to all the revenues earned by the access provider for the provision of below-rail services); and determining the methodology for the allocation of avoidable costs.

Sub-clauses (8) and (9) of the Code allow the regulator to determine a course of remedial action depending on the outcomes of the review of revenues. These requirements apply only if the regulator determines that revenues are excessive, so are not discussed in detail here.

## 2.5 Submissions to the review

Prior to the publication of the draft report in October 2021, a range of stakeholders provided comments and feedback on the state of competition on the Tarcoola to Darwin rail line to economic consultancy firm, HoustonKemp. The feedback was used by HoustonKemp in its assessment of competition, published with the Commission's draft report.

In October 2021, the Commission published a draft report for public consultation, outlining its methodology for the review of revenues and its draft findings. One written submission – from One Rail Australia (North) – was received in response.[16] One Rail Australia (North) also provided responses to questions from Commission staff in relation to its submission to the draft report.

Issues raised in One Rail Australia (North)'s submission related to:[17]

- the proposed methodology for the allocation of costs across portions of the rail infrastructure
- the proposed rate of return
- a perceived lack of consistency in the application of the review methodology, and
- the proposed review of the asset valuation methodology.

In preparing this final report the Commission has considered all submissions and information provided by One Rail Australia (North), and a number of amendments to the draft report have been included as a result. Certain arguments and submissions have been mentioned in the text of this report, either by direct quotation or by reference to themes or arguments, to assist stakeholders to understand the proposed positions that have been reached. A failure to reference an argument or submission does not mean that it has not been considered by the Commission in arriving at its conclusions.

## 2.6 Approach to the review

This review has compared the revenues earned for relevant below-rail services with maximum revenue limits, established as the efficient full-economic cost of access permitted under the Code (where the

[16] One Rail Australia (North), ESCOSA-Tarcoola to Darwin Railway – 5-year Review of Revenues 2013-14 to 2017-18, 26 November 2021, pp. 1-15, available at https://www.escosa.sa.gov.au/ArticleDocuments/21806/20211015-Rail-Tarcoola-Darwin-RailwayRevenueReview-DraftReport-Submission-OneRailAustralia.pdf.aspx?Embed=Y.

[17] One Rail Australia (North), pp. 1-15.

maximum price for an individual service is set at the total cost estimated in this review based on the DORC asset value, and allocated among sections and access holders (users) of the rail infrastructure). Should revenues exceed the limit, those revenues may potentially be considered excessive.

The structure of the final report is as follows. Chapter 3 describes recent economic performance including the level and composition of demand for below-rail services. The degree of competition for below-rail services is discussed and the below-rail services subject to sustainable competitive prices are identified. Chapter 4 estimates the maximum revenue limit, using two alternative cost allocation methodologies in relation to the required segments of the rail infrastructure. The maximum revenue limits are then compared with the relevant revenues earned. The chapter finishes with sensitivity analysis of certain key parameters, in part to address feedback received.

# 3 Assessment of sustainable competitive prices

- **Finding:** Below-rail services for the transport of mineral ores are not subject to sustainable competitive prices. Accordingly, the revenues earned from these services are included in the five-year review of revenues. In contrast, for below-rail services of intermodal freight, sustainable competitive prices exist, and, accordingly, intermodal freight revenues are excluded from the review of revenues.

The Commission's final assessment of sustainable competitive prices is organised into two parts. First, it outlines the Code's criteria to determine whether sustainable competitive prices exist. Second, it discusses the transport of key goods on the Tarcoola to Darwin rail line, such as mineral ore freight and intermodal freight, in the context of demand-side substitution and the state of competition.

## 3.1 Criteria to determine whether sustainable competitive prices exist

HoustonKemp has produced a report for the Commission about the degree of competition for below-rail services. Consistent with the definition of sustainable competitive prices as set out in Schedule (1)(2) of the Code,[18] they considered two key criteria:

1. whether there were impediments to transporting freight by means other than rail, and
2. whether other modes of transport provided an effective constraint on price.

According to HoustonKemp, the concept of an effective constraint on price is closely related to the definition of a workably competitive market.[19]

Ultimately, if the below-rail freight service is constrained by actual or potential rivals, then a sustainable competitive price could be said to exist.

## 3.2 Competitive environment according to the type of good transported

The demand for below-rail services on the Tarcoola to Darwin rail line is derived from the demand for transport services, which, in turn, flows from end-user demand for commodities and other goods that require transportation. The transport of mineral ores (such as iron ore and copper ore) accounted for approximately 42 percent of below-rail revenues earned by One Rail Australia (North) over the relevant period, while intermodal freight accounted for approximately 52 percent. Passenger services constituted approximately 6 percent; however, Clause 50(4)(b) excludes passenger services from the revenues being reviewed.

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[18] Schedule to the Code, Clause (1)(2) states that:

> *'A sustainable competitive price will exist in relation to the transportation of a particular type of freight where it can be demonstrated that – (a) there are no regulatory, technical or other practical impediments to transport of the freight by a mode of transport other than the railway or combination of such alternative modes; and (b) the availability or potential availability of modes of transport other than the railway is an effective constraint on the price of transporting such freight on the railway …'*

Clause (3) of the Code defines an effective constraint to *'…exist when it is likely that a supplier (or the threat of entry by a potential supplier) of transportation services by a mode other than rail (supplier A) will prevent another supplier of the same or similar transportation services by rail (supplier B) from sustaining prices materially above supplier B's long term efficient costs of supply without offering materially more in return'.*

[19] HoustonKemp, *Sustainable competition assessment for the Tarcoola-Darwin railway*, p. 9. It is noted that there are various models recognised for studying the state of competition in a market, not only the model of workable competition. Australian Competition Tribunal, *Application by Chime Communications Pty Ltd (No 2)* [2009] ACompT 2.

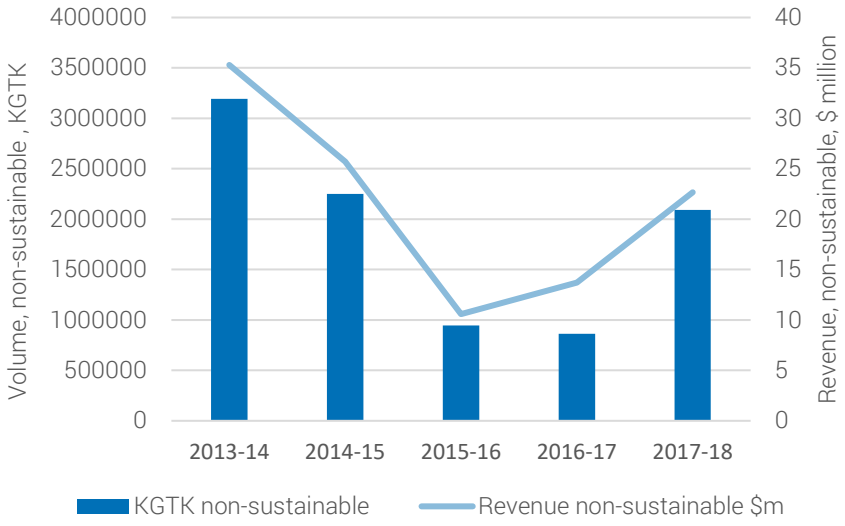
In reviewing and identifying the main variables of interest, the choices available to end-users of transport services are key. On the Tarcoola to Darwin rail line this involves the type of good transported (for example, mineral ore freight or intermodal freight), the availability of substitutes (road transport, shipping or air transport), and the origin and destination of the transport task (for example, transporting from a mine to a port, between Adelaide and Darwin, or between southern Australian cities and locations in the Northern Territory).

### 3.2.1 Below-rail services for the transport of mineral ore freight

Mineral ore products are known to be generally heavy, bulky and transported over long distances. These factors are known to favour the use of rail transport rather than other modes of transport.[20] The Commission's 2015 review of revenues earned on the Tarcoola to Darwin rail line concluded that rail did not face sustainable competitive prices in the transport of mineral ore freight.[21]

Since the 2015 review, demand for One Rail Australia (North)'s below-rail services for the transport of mineral ore freight has decreased (Figure 3). The sharp decrease, and subsequent modest upturn in 2017-18, largely reflects operations opening and closing[22] and fluctuations in mineral production.[23] These movements in transport and mining production coincided with a fall and subsequent pick-up in global metal commodity prices.[24] The decrease in volumes was a key driver of lower revenues.

Figure 3. Below-rail volumes and revenue transporting mineral commodities over the Tarcoola to Darwin rail line




Source: One Rail Australia (North)

HoustonKemp's research for the Commission, including discussions with stakeholders and results from survey questions, found that mineral ore freight has continued to be transported by rail on the Tarcoola to Darwin freight route with no apparent switching to road transport.[25] To complement qualitative information gathered from stakeholders, HoustonKemp used a hypothetical case study to

[20] Commission, *2020 South Australian Rail Access Regime Review - Final Report*, August 2020, p. 21, available at https://www.escosa.sa.gov.au/ArticleDocuments/21535/20200828-Rail-AccessRegimeReview-FinalReport.pdf.aspx?Embed=Y.

[21] Commission, *10-year review of revenues – Final report*, pp. 21-27.

[22] Such as for Southern Iron, CU River and Territory Resources.

[23] Such as for OZ Minerals and OM Manganese.

[24] Reserve Bank of Australia, *Index of Commodity Prices*, available at https://www.rba.gov.au/statistics/frequency/commodity-prices/2018/.

[25] HoustonKemp, pp. 10-12.

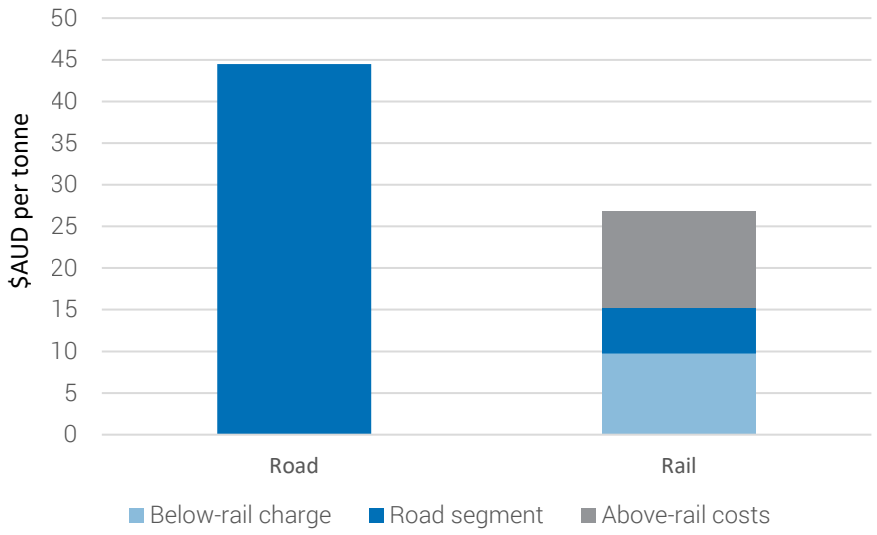
illustrate that rail transport of mineral ore products had a cost advantage over road transport over long distances (Figure 4). As stated by HoustonKemp: [26]

> *'[t]he hypothetical example … suggests that the costs of transporting bulk freight via rail is materially lower than road. This suggests that road freight services do not provide a sustainable competitive price. In other words, the below rail operator could increase its price by a small but significant amount (of, say five to ten per cent) and there would likely be limited switching from rail to road.'*

It is important to note that the hypothetical example is indicative only and the results are sensitive to the assumptions used. Those assumptions are outlined in Appendix A.1 in HoustonKemp's report.[27]

The implication of the evidence provided by HoustonKemp is that, while substitution might be theoretically possible between rail and road transport for the transport of mineral ore, especially at shorter distances, these possibilities have failed to eventuate in any material way over the long term on the Tarcoola to Darwin freight route. This suggests that road transport is not a practical and realistically commercial alternative for the transport of mineral ores on the Tarcoola to Darwin rail line.[28] In these circumstances, road transport may not act as an effective substitute that constrains below-rail prices.

Figure 4. Transport costs for a hypothetical mine located in the Northern Territory (800 km from Darwin)




Source: HoustonKemp

In its submission, One Rail Australia (North) supported the position that the transport of mineral ore was not subject to competition from road transport:[29]

[26] HoustonKemp, pp. 10-12.

[27] The example is for a mine approximately 800 kilometres from port and 450,000 tonnes of product is assumed to be transported per year. As a practical comparison, the distance involved in transporting mineral ore freight from Tennant Creek to Darwin is approximately 950 kilometres, and the distance transporting mineral ore freight from Wirrida to Adelaide is approximately 860 kilometres. As noted earlier, mineral ore is oftentimes transported between Tennant Creek and Darwin, and between Wirrida and Tarcoola (and then on to the interstate network to southern ports). This suggests that the distance used in the hypothetical example for both road transport and rail transport appears to be a reasonable indicative assumption.

[28] Patterns of actual transactions provide important insights into how firms' view markets. For instance, there might be barriers to entry or limitations to product substitutability that are not immediately obvious. There may be road congestion, limitations in integrating road transport to and from port terminals, or issues of community perceptions regarding safety and congestion preventing transport of mineral ores.

[29] One Rail Australia (North), p. 14.

> *Generally, we agree with ESCOSA's [draft] conclusion that bulk mineral ores are not subject to sustainable competitive prices. The nature of these movements, being high volume and over longer distances and in proximity to existing rail infrastructure lend themselves to rail transport. Where these movements may occur, they are very low volume and over short distances to be manageable. Ultimately, ORAN has seen little to no evidence of mineral ores moving via road.*

Overall, the Commission considers that the rail transport of mineral ore does not face a sustainable competitive price on the Tarcoola to Darwin rail line. The revenues earned from these below-rail services have therefore been included in the review of revenues for the period 1 July 2013 to 30 June 2018.

### 3.2.2 Below-rail services for the transport of intermodal freight

The Commission's 2015 revenue review found that intermodal rail freight faces competition from road transport, hence a sustainable competitive price likely exists. At that time it was noted that a number of firms offer flexible freight services between Adelaide and Darwin, and road transport could act as an effective substitute for the rail transport of containerised freight.[30]

HoustonKemp's research found that, in relation to intermodal freight:

- road transport is the only form of transport on the Tarcoola to Darwin freight route that could provide a practical alternative to rail (air freight and coastal shipping do not reportedly provide a sufficient degree of substitutability),[31] and
- the cost of road transport is estimated to be comparable to rail transport (Figure 5).[32]

Road transport has increased its market share on the Tarcoola to Darwin freight route over the past half-decade. Below-rail intermodal volumes decreased over the period in question, in part reflecting Coca-Cola moving its factory from South Australia to Western Australia, Woolworths shifting perishable goods to road to achieve a longer shelf life, closure of certain furniture and automotive manufacturing operations, and cessation of the construction of the Inpex LNG plant.[33] At the same time, road transport between the Northern Territory and southern Australian cities has reportedly increased in volume.[34] Road transport's market share is estimated by Houston Kemp at between 55 percent and 62 percent (although alternative estimates published by the AARC put the market share lower).[35]

In addition, HoustonKemp provided a qualitative assessment against the various factors set out in Clause (2)(b) of the Schedule to the Code. HoustonKemp's assessment did not highlight any issues that would materially alter its conclusions (Appendix B).

One Rail Australia (North) supported the position that intermodal rail transport faces competition from alternative forms of transport on the Tarcoola to Darwin freight route:[36]

> *We agree with ESCOSA's [draft] conclusion that intermodal rail transport is subject to sustainable competitive prices. Road transport offers a competitive alternative to rail transport for containerised product through the flexibility of service offering particularly on a customer-by customer basis, including "door to door" service. This is relative to rail offerings with six fixed services per week with limited ability to flex for any one customer's needs.*

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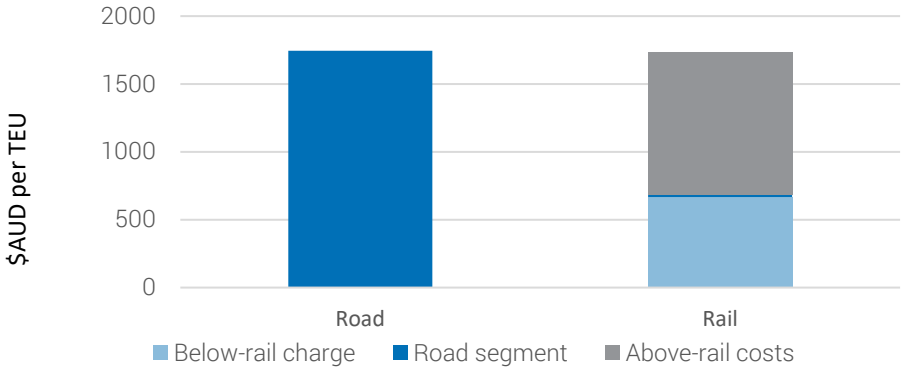
30 Commission, *10-year review of revenues – Final report*, pp. 21-27.
31 HoustonKemp, pp. 16-17.
32 HoustonKemp, pp. 16-17.
33 For instance, see AARC, *2016-17 Annual report*, p. 6, and AARC, *2017-18 Annual report*, p. 6.
34 HoustonKemp, pp. 18-20.
35 The AARC stated in its 2019-20 annual report that '*…[r]ail retains an estimated 76% market share, with ~85% of the contestable market for intermodal freight on the corridor ex SA'.* AARC, *Annual Report 2019-20*, p. 10.
36 One Rail Australia (North), p. 14.

*Competition around intermodal freight is common, ORAN have historically been impacted by such practices with customers such as Woolworths (fresh produce moved to road), Coles (via freight forwarder Linfox moving to road) and on various ad hoc occasions during derailment / track closures where freight forwarders will convert to road.*

Figure 5. Transport costs for a hypothetical intermodal freight route between Adelaide and Darwin[37]




Source: HoustonKemp

Overall, the Commission has determined that there is potential for customers to switch between using road and rail transport on the Tarcoola to Darwin rail route. Accordingly, below-rail freight services for intermodal freight has likely been subject to sustainable competitive prices for the period 1 July 2013 to 30 June 2018. As such, these revenues are excluded from being reviewed.

[37] The hypothetical example involves a logistics company moving around 14,000 twenty-foot equivalent units (TEUs) per year between Darwin and Adelaide. Assumptions are in Appendix A.1 in HoustonKemp's report.

# 4 The review of revenues

- **Finding:** Based on the assumptions adopted in undertaking this review, the actual revenues earned for providing below-rail services where no sustainable competitive prices exist are below the estimated maximum revenue limit.

This chapter identifies the below-rail revenue for the period 1 July 2013 to 30 June 2018 and compares it to the estimated maximum revenue limit for those same below-rail services. The maximum threshold is an estimate of the efficient economic cost of access, based on the assumptions adopted. This estimate is allocated across access holders and sections of the rail infrastructure. The review has been undertaken in accordance with Clause 50 of the Code.

## 4.1 Identifying the relevant below-rail revenues earned

One Rail Australia (North) has reported to the Commission the revenues earned from below-rail freight services for the transport of mineral ores over the period in question. The revenues collected were from commercially negotiated contracts with six end users;[38] no awards from arbitrators were made over the period. In total, the actual revenue earned was approximately $106.2 million in December 2014 dollars.

(Note that the dollar figures presented throughout this chapter are in December 2014 dollars.[39])

## 4.2 Methodology for establishing the maximum revenue limit

The maximum revenue limit is based on: [40]

- avoidable costs, including operating expenditure and a return on and of new assets[41]
- fixed costs, including a return on and of existing assets,[42] and
- an allocation of costs across access holders and relevant sections of the rail infrastructure.

The avoidable (below-rail) cost is the amount that would not have been incurred if access to rail infrastructure was not sought. It includes labour, materials and administration expenses that tend to vary with usage. While some individual operating expenses are composed theoretically of both an underlying fixed and variable component, for simplicity, operating costs are treated as avoidable costs in this review. Also, while a return on and of new assets is not in full an avoidable cost, given the minor size of this variable (discussed later on), it is treated as an avoidable cost for simplicity in this review.

The fixed costs of the rail infrastructure do not vary with usage, and are calculated in this review as the return on and of existing rail infrastructure.

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38 End users of rail infrastructure were mineral operations including, OM Manganese, OZ Minerals, Territory Resources, CU-River and Southern Iron. In addition, the access revenues for the period included those from private above-rail rail operator, SBR, which, as noted earlier, appears to have provided below-rail services for the Cairn Hill mine for one financial year (2013-14) of the review period in question.

39 The December 2014 price base was selected on the basis that it was consistent with the 2015 review.

40 Note that a pre-tax regulatory rate of return is used, therefore a tax allowance is not calculated as it is already incorporated into the return on assets.

41 As mentioned in Chapter 2, Clause 50(5)(d) requires that costs must be determined incorporating the avoidable costs of all other access holders attributable to the usage of the required relevant rail infrastructure. Those costs must be of the kind referred to in the Schedule to the Code. For instance, these costs are to include labour and material costs and an appropriate allocation of administration costs.

42 As mentioned in Chapter 2, Clause 50(5)(d) requires that costs must be determined incorporating a reasonable contribution to fixed costs from all other access holders using the relevant rail infrastructure.

Recognising that there can be different methodological approaches to account for segments of rail infrastructure required by access holders, the Commission's draft report proposed two alternative cost allocation methodologies: one was based on allocating costs across the entire rail line, while the other was based on allocating costs across only a portion (48 percent) of the line. In response, One Rail Australia (North) raised concerns regarding the second proposed cost allocation method.[43] These concerns are discussed in section 4.2.2.1.

### 4.2.1 Allocation of avoidable and fixed costs between access holders

Avoidable costs have been allocated according to the estimated share of usage by freight type based on a gross tonne kilometres basis (GTK) (for example, as shown in Table 2). This cost allocation method is consistent with a user-pays approach. It is an industry standard approach to allocating costs.[44] No concerns with this approach were raised in submissions.

Table 2. Estimated share of usage by freight type, based on a GTK basis, based on the entire length of rail line

| | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 |
|---|---|---|---|---|---|
| Freight where no sustainable competitive price exists (%) | 42 | 33 | 18 | 17 | 40 |
| All other access holders (intermodal and passenger) (%) | 58 | 67 | 82 | 83 | 60 |

In terms of fixed costs, the Code requires that a reasonable contribution be allocated across all access holders. The allocation method adopted in this review estimates the contribution from all other access holders and subtracts it from total fixed costs. The remainder is the contribution to fixed costs where no sustainable competitive price exists. No concerns with this approach were raised in submissions.

The approach to fixed costs adopted in this review is in accordance with Schedule (2)(2)(c) of the Code. It requires that the maximum contribution to fixed costs from access holders subject to sustainable competitive prices be calculated as the revenue earned by all such access holders less the avoidable costs attributable to them. Put simply, the avoidable cost accounts for the incremental cost of usage and the remainder is the maximum contribution to fixed costs for which access holders subject to sustainable competitive prices are liable. This means that the overall contribution by those access holders that have the capacity to substitute to an alternative transport service is no more than the revenue earned from them. Appendix C provides a simple descriptive example to illustrate this type of calculation.

### 4.2.2 Allocation of costs across segments of the rail infrastructure required by access holders

#### 4.2.2.1 Cost allocation approaches in the draft report

The Commission's draft report proposed two key options for allocating costs across portions of rail infrastructure:

1. Cost allocation method option 1: costs were allocated across the entire rail line, and

[43] One Rail Australia (North), p. 9-12.

[44] This type of usage approach has historically been used by industry to distribute common costs; Freebairn J, *Access prices for rail infrastructure*, The Economic Record, vol. 74, No. 226, September 1998, p. 289.

2. Cost allocation method option 2: costs were apportioned to account for the rail line directly used for the movement of mineral ore to the nearest port (which equated to approximately 48 percent of the line).

The Commission's approach in the draft report was adopted on the basis that Clause 3 of the Code refers to required rail infrastructure as the portion of infrastructure required from the access provider in order to provide the relevant railway infrastructure service to the access seeker or access holder.

In its submission to the draft report, One Rail Australia (North) raised concerns in relation to methodological consistency and cost allocation method option 2, which are summarised below with the Commission's responses:[45]

Point 1: The importance of consistency in regulatory methodologies was stressed.[46] It was claimed that the adoption of different methodological elements in this current review compared with the previous (2015) review has increased uncertainty about how the review will be undertaken in future. It was claimed that the Code does not allow for a revision of the methodology until 2030 (when certification ends).[47]

*Response*

The Code does not specify that certain factors of the methodology cannot change. The Code outlines the various factors that must be considered in determining whether revenues have been excessive under a Clause 50 review.

This review has adopted elements of its methodology that are different from the previous review. This reflects the Commission's assessment of the criteria and factors required to be considered under the Code and the best available methodological approaches to meet those. As discussed later on, the Commission has undertaken sensitivity analysis of key parameters in order to document the impact, particularly as it relates to factors and elements of the methodology in which there may be ambiguity or reasonable alternative positions.

The Commission recognises that the issue of appropriate methodologies to be applied in accordance with the scope and intent of the Code is a critical one, and hence intends to give it full consideration in the proposed review of asset valuation methodologies in 2022-23.

Point 2: Segments of rail infrastructure were argued to be operationally linked.[48] Costs were reported to be structured around the entire line, not any particular segments, and as a result, it was claimed that the costs incurred in one segment were a necessary condition for the operation of another segment. Also, it was claimed that access offerings have (and must) make available the entire rail line.[49]

*Response*

Ultimately, cost allocation methodologies involve important but necessary assumptions, and the two cost allocation approaches adopted in the draft report were simple, albeit imperfect, methods for having regard to Clause 3 of the Code. The operational linkages across portions of infrastructure, the existence and allocation of common costs,[50] and the differing demand preferences from end users

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45 One Rail Australia (North), p. 9.

46 One Rail Australia (North) stressed that regulatory consistency is important because it can lower compliance costs and risk, and can support demand for below-rail services and investment by private firms. One Rail Australia (North), pp. 1-15.

47 One Rail Australia (North), p. 15.

48 One Rail Australia (North), p. 9.

49 One Rail Australia (North), p. 9.

50 Common costs are those costs necessary to produce multiple services, but which cannot be directly assigned to a specific service.

(which can create capacity pressures in certain segments at particular times), are all common issues for essential infrastructure. These are not issues that invalidate cost allocation method option 2.

Point 3: Excluding large parts of the rail line, as under option 2, was argued to be inconsistent with observed outcomes, as during the period some mineral ore was transported on the excluded line.[51] The transportation of OZ Minerals' mineral output was cited as an example.

*Response*

One Rail Australia (North) noted that mineral ore was transported by rail between Wirrida and Tennant Creek during the review period.[52] Data indicates that approximately 80 to 90 percent (as measured in gross weight trains[53]) of rail transport of mineral ore was transported south to Tarcoola (rather travelling north to Tennant Creek).

When compared to the gross measure of all other access holders transporting freight between Wirrida and Tarcoola, the share transporting mineral ore accounts for approximately 22 percent.[54]

Nevertheless, in spite of the apparent relatively small shares of usage of the Wirrida to Tennant Creek lines, Clause 50(5)(a) of the Code states that costs are to be those required by the access holder including a return on infrastructure *used* by access holders.[55] There may, therefore, be a case to adjust cost allocation method option 2 to take account of this small amount of usage. Accordingly, in the sensitivity analysis in section 4.5, an upward adjustment assumption has been applied to the excluded rail infrastructure under option 2.[56] The result is that the margin between the maximum revenue limit and One Rail Australia (North)'s earnings is widened.

Point 4: It was argued that efficient costs could be expected to include an allowance for option value should access holders require to transport bulk commodities to ports either in the north or the south (if, say, market circumstances incentivised it, or if unforeseen disruptions arose in supply chains).[57]

*Response*

It is acknowledged that there could be option value derived by access holders from the ability to transport mineral ore south or north. This option value could, in theory, be an efficient cost of access.

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51 One Rail Australia (North), p. 9.

52 One Rail Australia (North), p. 9.

53 The metric of gross weight trains is imperfect and can be affected by how long and well-utilised trains are.

54 Calculated as the volumes of all other access holders on the Tarcoola and Tennant Creek segment (12,334,980 KGTKs), minus the volumes of all other access holders between Wirrida and Tarcoola (1, 242,905). Then adjusting for the distance between Wirrida and Tarcoola (1,161 kilometres), it gives approximately 9,550 gross weight trains for all other access holders between Wirrida and Tennant Creek. In contrast, the volume of non-sustainable freight on the Tarcoola and Tennant Creek segment (3,523,660 KGTKs) minus the volumes between Wirrida and Tarcoola (355,053), gives 3,168,607 KGTKs between Wirrida and Tarcoola. Then adjusting for the distance between Wirrida and Tarcoola (1,161 kilometres), it gives approximately 2,729 gross weight trains for non-sustainable freight between Wirrida and Tennant Creek. This is approximately 22 percent of the total gross weight trains on the segment between Wirrida and Tennant Creek. The underlying data for this calculation can be found in Appendix D.

55 Clause 50(5)(a) states that: '*… the relevant revenues are to be measured against the costs associated with the required railway infrastructure required by the relevant access holders including an appropriate commercial return on the required railway infrastructure used by the relevant access holders in the circumstances referred to in subclause (4) (the relevant required railway infrastructure)'.*

56 Recognising that there can be volatility from year to year, for simplicity 20 percent of transport with no sustainable competitive price is assumed on the line between Wirrida and Tennant Creek. This is calculated as: 0.2 (20 percent) multiplied by 0.52 (52 percent), which gives approximately 0.11. This has been added to 0.48 (48 percent), giving 0.59 (59 percent) to be used as the cost allocation portion in method 2 in the sensitivity analysis in section 4.5 in relation to the adjustment for usage.

57 One Rail Australia (North), pp. 9-10.

Furthermore, insofar as option value is required by access holders, it may be considered a cost as outlined under Clause 50(5)(a) of the Code. Indeed, that One Rail Australia (North)'s market offerings[58] have reportedly been for the entire line may be evidence of a revealed preference from end users for some degree of option value.

A key issue is that option value must be efficient if it is to be in accordance with the Code and therefore embedded in the maximum revenue limit. Yet estimating the efficient cost associated with option value can be difficult,[59] and One Rail Australia (North) did not provide an empirical estimate in its submission.

One simple proxy involves including theoretical depreciation for the excluded existing rail line assets within cost allocation method option 2. This would account for the cost of maintaining the rail line, thereby providing contingency value to access holders.[60] Sensitivity analysis has been presented in section 4.5 to illustrate the results when using this proxy. Taken at face value, option value would likely have to be quite large to account for the excluded rail line under option 2.

Overall, if the maximum revenue limit was exceeded when applying cost allocation method option 2, then the presence and magnitude of option value could be given further consideration, but this is not warranted in this review given that the revenues earned have been well below the estimated maximum revenue limits, irrespective of the cost allocation method used.

Point 5: It was argued that it is the costs associated with infrastructure that matter according to the Code, so cost allocation method option 2 should take account of the fixed costs attributable to all rail infrastructure. Also, it was argued that a range of operating costs do not vary with usage and may be fixed regardless of the line segment utilised, and therefore should not be considered avoidable costs.[61]

*Response*

First, the approach adopted in the draft report accounted for the fixed costs of required rail infrastructure. The Commission weighted depreciation and a return on assets by shares of distance of the required rail infrastructure. Second, the wording of Clause 50(5)(a) does not indicate that it is the costs associated with, say, operating all of the railway; rather it is the costs associated with the rail infrastructure required by access holders. Furthermore, the clause states that it must include an appropriate commercial return on the required railway infrastructure used by the relevant access holders; it does not state that it should include a return on all railway infrastructure.

Also, One Rail Australia (North) argued that a range of operating costs do not vary with usage and may be considered fixed regardless of the line segment utilised, and therefore should not be considered avoidable costs.[62] However, while there may be some operating costs that are semi-variable in nature and have fixed cost characteristics, operating costs are a relatively small component of total costs and the methodology in any case accounts for total economic costs both fixed and avoidable (see sensitivity analysis in section 4.5).

Point 6: On a technical point, it was argued that the methodology – as applied in the draft report – had an error in relation to the calculation of the contribution to fixed costs from intermodal freight.[63]

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58 One Rail Australia (North), p. 9.

59 This would involve estimating the probability of usage and end-users' willing to pay for usage in the event of a contingency event.

60 Recent weather events have impacted rail infrastructure in northern South Australia. This situation provides an example in which contingency events could potentially be realised. See Puddy, R, *Australian Rail Track Corporation says line closed between SA, WA and NT due to heavy rain in outback*, ABC News, 24 January 2022, https://www.abc.net.au/news/2022-01-24/rail-line-closed-between-sa-and-wa/100777316, Accessed 2 February 2022.

61 One Rail Australia (North), pp. 9-10.

62 One Rail Australia (North), pp. 9-10.

63 One Rail Australia (North), pp. 9-10.

*Response*

The Commission accepts this point and has adjusted option 2 accordingly. Relative to the draft report, the result is a wider margin between the maximum revenue limit and One Rail Australia (North)'s actual earnings during the period.

#### 4.2.2.2 Cost allocation approaches in the final report

For the reasons outlined in the section above, the Commission has adopted:

- Cost allocation method option 1: costs were allocated across the entire rail line, and
- Cost allocation method option 2: costs were apportioned to account for the rail line directly used for the movement of mineral ore to the nearest port (which equated to approximately 48 percent of the line), but, in line with the point 6 (above), the revenue from all other access holders is also apportioned by 48 percent of the rail line.

The Commission's final finding is that, while both approaches are imperfect, each one has some advantages that make it worthwhile as an input into an assessment of excessive revenues. The Commission's final finding states no preference for either method and has included sensitivity analysis in section 4.5 to illustrate the impacts of several key parameters.

## 4.3 The calculation of the maximum revenue limit

This section outlines the underlying calculations in the final report to estimate the maximum revenue limit. It outlines calculations for operating costs, depreciation and return on assets, summarises the cost components into avoidable and fixed costs, and calculates access holders' contributions to fixed costs.

### 4.3.1 Operating costs

The Commission's final finding in regard to operating expenditure is outlined in Table 3 below. One Rail Australia (North)'s operating costs were provided to the Commission and these have been adjusted using the two alternative options noted above.[64] That is, option 1 presents operating cost figures weighted according to estimated share of usage as shown earlier in Table 2 (when distance is set to the entire line), while option 2 presents figures weighted by 0.48 (48 percent for distance) and on estimated share of usage basis (when distance is set for only relevant rail lines, as shown below in Table 4). (By way of background, Appendix D provides a step by step calculation of the share of usage calculation.)

Table 3. Operating costs (December 2014 dollars)

| | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | Total |
|---|---|---|---|---|---|---|
| Option 1 | | | | | | |
| Freight where no sustainable competitive price exists, $m | 6.8 | 5.2 | 2.7 | 2.4 | 5.5 | 22.6 |
| Other access holders, $m | 9.6 | 10.7 | 12.5 | 11.3 | 8.2 | 52.3 |
| Option 2 | | | | | | |

[64] Operating expenditure items included linehaul & operating costs, track maintenance, general administration, insurance claims and insurance, and taxes other than income.

| | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | Total |
|---|---|---|---|---|---|---|
| Freight where no sustainable competitive price exists, $m | 4.0 | 3.3 | 2.0 | 1.3 | 2.8 | 13.5 |
| Other access holders, $m | 3.9 | 4.3 | 5.3 | 5.2 | 3.8 | 22.5 |

Given the small size of operating costs, the Commission has not undertaken a bottom-up, itemised efficiency review of One Rail Australia (North)'s operating costs. Further, while some individual operating expenses may actually be semi-variable in nature – a point raised by One Rail Australia (North) in its submission[65] –for simplicity operating costs are treated as avoidable costs.

Table 4. Estimated share of usage by freight type, GTK basis, based on only relevant (48 percent) of the rail line

| | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 |
|---|---|---|---|---|---|
| Freight where no sustainable competitive price exists (%) | 51 | 43 | 28 | 20 | 43 |
| All other access holders (intermodal and passenger) (%) | 49 | 57 | 72 | 80 | 57 |

### 4.3.2 Starting asset value, depreciation and capital expenditure

The Commission's final finding in this review is to:

- adopt the Depreciated Optimised Replacement Cost (DORC) value as the initial asset value (Box 1)
- include government-contributed assets and other government financial assistance in the asset value (Box 1)
- adopt actual new capital expenditure as submitted by One Rail Australia (North),[66] and
- adopt a regulatory depreciation value calculated using a straight-line method and a 50-year asset life that aligns with the term of the Concession deed.

The approaches noted above are in line with those adopted in the previous review.[67]

By way of background, Appendix D provides a calculation of the roll-forward of the asset value excluding government-contributed assets and other government financial assistance. This is included in the sensitivity analysis in section 4.5.

[65] One Rail Australia (North), p. 10.

[66] Given the small size of new capital expenditure, the Commission has not undertaken a prudency and efficiency assessment of that capital spend. New capital expenditure was supplied by One Rail Australia (North). For the review period in question, the steps we took were to: sort capital expenditure on the basis of financial year and below-rail services. Capital expenditure for the period prior is in line with that recorded in the Commission's ten-year review of revenues completed in 2015.

[67] Commission, *10-year review of revenues – Final report*, pp. 1-43.

**Box 1. Asset valuation of rail infrastructure for the current 2013-14 to 2017-18 review**

Selecting the initial asset valuation methodology

In 2005, an initial DORC value of the rail infrastructure was prepared by external consultants, BOOZ Allen Hamilton on behalf of the owners of the railway at the time, APT. The initial DORC value was approximately $1,696.9 million at July 2003 (expressed in nominal terms; including government-contributed assets and other government financial assistance). The DORC asset value was adopted in the 2015 review and for this review.

Government-contributed assets and other government financial assistance

As highlighted in Chapter 2, the construction of the Tarcoola to Darwin rail line faced significant greenfields project risk and it accordingly relied on government-contributed assets and other government financial assistance to bring the project forward.[68] This final finding has included those contributions on the basis that the risk exposure at the time of construction of the rail infrastructure is estimated to be captured in the risk premium of the regulatory rate of return.

By way of background, in 2003, the Commission calculated that, for ceiling price purposes, the post-tax real terms risk premium applied to total assets was 2.6 percent[69] (which was reported as equivalent to a risk premium of 13.1 percent if applied to project funds).[70] The large difference reflects in part that, as highlighted in Chapter 2, there was a large amount of government contributions at the time of commencement of construction of the rail infrastructure. This is discussed in section 4.3.3.2.

#### 4.3.2.1 Roll-forward calculations including contributed assets

In calculating the asset value for the final report, the initial DORC value at July 2003, of approximately $2,301 million, has been rolled forward in real terms. The steps taken were to add new capital expenditure and deduct the value of regulatory depreciation.[71]

Because depreciation is greater than the additional capital expenditure over the period, there is a decline in the asset value.[72] The asset value decreases from an opening value of $1,889.6 million in 2013-2014 to a closing value of $1,702.9 million in 2017-2018. The roll-forward table for the period in question is shown in Table 5.[73]

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68 Code, Clause 50(5).

69 The Commission's 2003 finding accounted for the debt risk premium (1.2 percent), debt-to-capital ratio (60 percent) and asset beta (of 0.55) at the time of commencement of the project. The parameter values were informed at that time by industry information. Commission, *Tarcoola-Darwin Railway: Regulated Rates of Return*, Provisional Determination, 2003, pp. 23-34.

70 The 13.1 percent risk premium on project funds was calculated in 2003 based on project-specific rate of return parameters (including a project-specific debt-to-capital ratio of 70 percent, an asset beta of 0.62 and a debt risk premium of 3.24 percent) and an uplift factor (or 'truncation premium') applied to take into account the probability distribution of expected pre- and post-regulation returns. The risk premium was based on a nominal post-tax ceiling rate of return of 17.7 percent on project funds. Commission, *Tarcoola-Darwin Railway: Regulated Rates of Return*, Provisional Determination, 2003, pp. 23-34.

71 Calculated as the average of the opening and closing value, divided by the remaining asset life, noting that the asset life is set at 50 years starting in 2003-2004.

72 Disposals were nil over the period.

73 To provide an example of the calculation, the average of the opening and closing asset value in 2013-2014 was $1,872 million, and dividing this by 40 (which represents the remaining asset life), gives approximately $47 million, as shown in the table above. The remaining asset life is 40 years because 10 years has passed since 2003-2004 when the asset life was set at 50 years to align with the start of the Concession deed.

Table 5. Roll-forward of the asset base over the period of the review (December 2014 dollars)[74]

| Total assets | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 |
|---|---|---|---|---|---|
| Opening asset value ($m) | 1889.6 | 1854.3 | 1817.5 | 1780.9 | 1743.1 |
| Capital expenditure ($m) | 11.5 | 10.1 | 10.6 | 9.6 | 7.3 |
| Disposals ($m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Depreciation ($m) | 46.8 | 47.0 | 47.2 | 47.4 | 47.5 |
| Closing asset value ($m) | 1854.3 | 1817.5 | 1780.9 | 1743.1 | 1702.9 |

In order to distinguish between new and existing assets, capital additions and the associated regulatory depreciation were calculated.[75] The steps taken were to calculate:

- cumulative capital expenditure, and
- the difference between depreciation (when including and excluding new capital expenditure).

Table 6 shows the roll-forward for existing assets (ie excluding new capital expenditure), while Table 7 shows new asset values rolled forward.

Table 6. Roll-forward of existing asset base only (excluding new capital expenditure) (December 2014 dollars)

| Existing asset base | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 |
|---|---|---|---|---|---|
| Opening asset value ($m) | 1866.1 | 1820.1 | 1774.0 | 1728.0 | 1682.0 |
| Capital expenditure ($m) | 0 | 0 | 0 | 0 | 0 |
| Disposals ($m) | 0 | 0 | 0 | 0 | 0 |
| Depreciation ($m) | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 |
| Closing asset value ($m) | 1820.1 | 1774.0 | 1728.0 | 1682.0 | 1635.9 |

Table 7. Roll-forward of capital additions (including new capital expenditure) (December 2014 dollars)

| New assets | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 |
|---|---|---|---|---|---|
| Opening asset value for new assets ($m) | 23.5 | 34.3 | 43.5 | 52.9 | 61.1 |
| Capital expenditure ($m) | 11.5 | 10.1 | 10.6 | 9.6 | 7.3 |
| Disposals ($m) | 0 | 0 | 0 | 0 | 0 |
| Depreciation ($m) | 0.7 | 0.9 | 1.2 | 1.3 | 1.5 |
| Closing asset value ($m) | 34.3 | 43.5 | 52.9 | 61.1 | 67.0 |

[74] Figures in Tables 5, 6, and 7 may not sum due to rounding.

[75] The latter is calculated as the difference between depreciation of the asset value including new capital expenditure, and depreciation based on a roll-forward of the asset base in which no capital expenditure is added.

#### 4.3.2.2 Summary of new and existing assets

This section calculates the regulatory depreciation on new and existing assets for the final report.

For existing assets, under option 1, regulatory depreciation remains as it is in Table 6 above. Under option 2, however, regulatory depreciation is multiplied by 0.48 to account for the distance of the relevant line (ie only 48 percent of depreciation is included). This can be seen in Table 8 below.

For new assets, under option 1, regulatory depreciation is multiplied by share of usage (which was shown earlier in Table 2). Under option 2, however, regulatory depreciation is multiplied by both 0.48 and by the share of usage for those relevant rail lines (which was shown in Table 4). Table 9 below presents the results for that calculation. (By way of background, Appendix D provides a step by step calculation of the application of the cost allocation options to depreciation of new assets.)

Table 8. Depreciation on existing assets (December 2014 dollars)

| | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | Total |
|---|---|---|---|---|---|---|
| Option 1 | | | | | | |
| Depreciation – existing ($m) | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 230.1 |
| Option 2 | | | | | | |
| Depreciation – existing ($m) | 22.2 | 22.2 | 22.2 | 22.2 | 22.2 | 110.8 |

Table 9. Depreciation on new assets (December 2014 dollars)

| | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | Total |
|---|---|---|---|---|---|---|
| Option 1 | | | | | | |
| Depreciation – new ($m) | 0.3 | 0.3 | 0.2 | 0.2 | 0.6 | 1.7 |
| Option 2 | | | | | | |
| Depreciation – new ($m) | 0.2 | 0.2 | 0.2 | 0.1 | 0.3 | 1.0 |

#### 4.3.2.3 Discussion paper exploring the topic of asset valuation of the rail infrastructure

In the draft report the Commission highlighted that it saw value in exploring the topic of asset value methodologies prior to, and for future use in, revenue reviews. The exploration of the asset valuation topic is intended to take the form of a discussion paper to be published in 2022-2023.

In response, One Rail Australia (North) raised concerns that a departure from the use of a DORC value would not be consistent with the Code and Schedule and stated that it is not within the functions and powers of the Commission under the Code to deviate from the application of DORC for the purposes of a review under clause 50(4) of the Code. It also argued that changes should only happen prospectively at the start of a five-year revenue period and could only take effect after 2030. [76]

Having considered the evidence and position put forward by One Rail Australia (North), the Commission will still proceed with the discussion paper in 2022-2023, which will outline the reasons why it considers it can examine the topic of asset valuation. As explained in the draft report, the discussion paper is intended to explore arguments and evidence for various asset valuation methodologies in a transparent

[76] One Rail Australia (North), pp. 12-13.

manner for the benefit of all stakeholders. It does not pre-suppose any particular outcome and does not impact on this review.

The discussion paper process will allow for comments and stakeholder input on various issues, including appropriate asset valuation methodologies and the future application of methodologies in subsequent reviews.

### 4.3.3 Return on assets

#### 4.3.3.1 Rate of return in the draft report

The Commission adopted a pre-tax real rate of return of 2.44 percent in its draft report. This was based on a real risk premium of 2.6 percent, as calculated by the Commission in 2003[77] and published in its arbitration guidelines.[78]

That risk premium was included in the draft report on the basis that:

- the rate of return applied to rail infrastructure *included* government-contributed assets and other government financial assistance, and
- Clause 50(5)(c) of the Code specifies that the return must have regard to an appropriate risk premium based on the *'expected risks prevailing at the time of the commencement of construction'*.

June 2021 financial markets data was used in the draft report. The timing of the market observations was selected in accordance with Clause 50(5)(d) of the Code, which specifies that in determining an appropriate commercial return the Commission must have regard to financial market rates *'prevailing at the time of the regulator's review'*.[79]

In response to the draft report, One Rail Australia (North) made a number of points regarding the appropriateness of the rate of return that was applied, which are summarised below with the Commission's responses.

Point 1: A real rate of return of 2.44 percent was argued to be too low and inconsistent with an appropriate commercial return under clause 50(5) of the Code.[80] As evidence, One Rail Australia (North) argued that reference rates from other jurisdictions should be drawn on and adopted as a minimum (or floor) rate. It was also claimed that recent interstate determinations have exceeded the rate adopted by the Commission.[81]

*Response*

As a matter of law, regulators must use rate of return methodologies that meet their legislative requirements and objectives. Those requirements and objectives can differ by jurisdiction and by industry.

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77 Commission, *Tarcoola-Darwin Railway: Regulated Rates of Return*, Provisional Determination, 2003, pp. 23-34.

78 See the latest version of the arbitration guidelines: Commission, *Rail Industry (Tarcoola-Darwin) Guideline No 2 – Relevant Pricing during Arbitrations*, October 2019, pp. 11-12, available at https://www.escosa.sa.gov.au/ArticleDocuments/1061/20191029-Rail-GuidelineNo2-Tarcoola-Darwin.pdf.aspx?Embed=Y.

79 The June quarter of 2021 was selected as it includes the latest available data for published bond-breakeven rates from the Reserve Bank of Australia.

80 One Rail Australia (North), pp. 5-8.

81 Interstate returns included: QCA DBCTM DAU decision – post-tax nominal WACC of 5.85 percent; ERA (WA) Pilbara Railways determination – post-tax real WACC of 5.91 percent; QCA – Aurizon UT5 decision – 5.9 percent; ARTC Coal Network ACCC – pre-tax real WACC of 4.6 percent. See One Rail Australia (North), pp. 5-6.

Clause 50(5)(c) of the Code does not specify what an appropriate commercial return should be when determining whether or not revenues earned on the Tarcoola to Darwin railway have been excessive. Rather, the clause states that in determining whether revenues are excessive, the regulator must have regard to various factors, including the expected risks prevailing as at the date of commencement of construction of the railway.

It is not apparent from One Rail Australia (North)'s submission how recent rate of return decisions in interstate jurisdictions (or in commercially negotiated outcomes) would sufficiently account for both the risks at the time of the commencement of construction of the Tarcoola to Darwin rail infrastructure and the impact on those risks from including or excluding contributed assets. On the contrary, the Commission's approach in this review takes into account an assessment of the expected risks at the commencement of construction, as required under the Code. It is noted that the Commission's approach in the previous review was informed by rate of return decisions in interstate jurisdictions.

Point 2: The presence of an implied negative real risk-free rate was considered inconsistent with an appropriate commercial return.[82] Also, One Rail Australia (North) claimed that the financial market measure of long-term inflation expectations might be affected by temporary supply concerns in the economy, potentially raising it higher than the average seen over recent years.

*Response*

First, international studies as well as some international regulators have found that a negative real risk-free rate is not inconsistent with economic theory.[83,84] Second, a negative real risk-free rate has been included (or implied) within regulatory determinations in Australian and overseas jurisdictions.[85] Indeed, low nominal interest rates and negative real risk-free rates are a commercial reality facing many investors.

One Rail Australia (North)'s submission also pointed to perceived limitations in the inflation-linked securities measure adopted for long-term inflation expectations. However, it did not propose an alternative financial market-based measure, as required under the Code.

One Rail Australia (North)'s main concern was with the time period adopted for the selection of market parameters. But the time period adopted for long-term inflation expectations must be consistent with the timeframe adopted for the ten-year nominal risk-free rate: to calculate a real risk-free rate one needs to account for the expected long-term inflation that is embodied within the same term to maturity of the nominal risk-free rate. Inflation-linked securities were the measure of long-term inflation expectations adopted in the draft report to be consistent with the Code, which specifies that the measure must have regard to financial market rates.

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82 One Rail Australia (North), pp. 6-7.

83 A real risk-free rate is an unobserved variable. It represents the nominal risk-free rate adjusted for inflation expectations. Over the long-term, a real risk-free rate may be argued to approximate the long-term potential growth rate of the economy. However, this is a theoretical long-run proposition with an abstract timeframe; it is not commonly applied in regulatory determinations. See Commission, *SAWRD20 Statement of reasons – Final*, pp. 274-276.For a detailed discussion, see Commission, *SAWRD20 Statement of reasons – Final*, pp. 274-276, available at https://www.escosa.sa.gov.au/ArticleDocuments/21489/20200611-Water-SAWRD20-FinalDetermination-StatementOfReasons.pdf.aspx?Embed=Y.

84 For instance, real yields on government securities have been estimated to be negative in Australia and other advanced economies in various historical periods including the 1920s to 1930s, 1960s and 1970s. Commission, *SAWRD20 Statement of reasons – Final*, pp. 274-276.

85 The Commission used an implied risk free rate of -1.1 percent in its 2020 regulatory determination for SA Water, and the AER used an implied real risk-free rate of -1.18 percent in its October 2019 draft decision on SA Power Networks' rate of return. Ofwat's December 2019 final price determination used an implied real risk-free rate of -1.39 to -2.35 percent to calculate ranges for the regulatory rate of return. Commission, *SAWRD20 Statement of reasons – Final*, pp. 274-276.

Issues regarding the timing of market observations are discussed below under point 3.

Point 3: The application of current market observations (for June 2021) to the review period (2013-2014 to 2017-2018) was argued to be: (i) inconsistent with good regulatory practice (for example, it was argued that the regulator's review should have occurred at the end of the 5-year period with the adoption of financial market parameters from 30 June 2018); and (ii) distortionary (by disconnecting the review period from the financial market parameters adopted). Also, One Rail Australia (North) noted that an alternative approach to the timing of market observations could be to use actual observed market outcomes over the period in question.[86]

*Response*

Clause 50(5)(d) of the Code specifies that in determining an appropriate return the Commission must have regard to financial market rates *'prevailing at the time of the regulator's review'*.[87] In its draft report the Commission therefore selected financial market parameters as of June 2021.

Recognising that there is some ambiguity regarding how soon after the end of the regulatory period the regulator's review should take place,[88] this report also includes sensitivity analysis to illustrate the effects of differently timed market observations.

Point 4: The adoption of the real risk premium of 2.6 percent was argued to be inconsistent with previous statements made by the Commission, and to be applicable only in arbitration, not in a revenue review. Moreover, it was argued that the Tarcoola to Darwin railway experiences more volatility and lower traffic than most other railways, and this higher level of risk should be compensated for in the allowed rate of return.[89]

*Response*

The first issue to highlight is that the (ceiling) real risk premium of 2.6 percent was adopted in the draft report because it directly relates to the estimated risks at the commencement of construction as estimated by the Commission in 2003.[90] This real risk premium was based on *including* government-contributed assets and other government financial assistance in the asset value.

If, in contrast, the asset value *excluded* contributed assets, a (ceiling) real risk premium of 13.1 percent (as estimated by the Commission in 2003) could apply.[91] This would result in a much higher rate of return: a pre-tax real rate of return of approximately 14.44 percent (see Appendix D). Sensitivity analysis when excluding contributed assets, but including a risk premium of 13.1 percent, is shown in section 4.5.

The second issue to consider is the degree of confidence in the real risk premiums. While there is difficulty in being precise about both the level of risk prevailing at the time of commencement of construction and the degree to which contributed assets might have reduced that level of risk, the

86 One Rail Australia (North), pp. 7-8.

87 The June quarter of 2021 was selected as it includes the latest available data for published bond-breakeven rates from the Reserve Bank of Australia.

88 On the one hand, while Clause 50(4) or 50(10) does not specify that financial market parameters be estimated at the end of the five-year review period (as was suggested by One Rail Australia (North)), it could reasonably be expected that a regulator's review be undertaken relatively soon after the review period has ended. On the other hand, there can be practical reasons that a review may not be immediately undertaken. The use of actual observations during the period, as suggested by One Rail Australia (North), would be inconsistent with Clause 50(5)(d), as these financial market rates would not be those prevailing at the time of the regulator's review.

89 One Rail Australia (North), pp. 5-6.

90 Commission, *Tarcoola-Darwin Railway: Regulated Rates of Return*, Provisional Determination, 2003, pp. 23-34.

91 Commission, *Tarcoola-Darwin Railway: Regulated Rates of Return*, Provisional Determination, 2003, pp. 23-34.

Commission must, as required under Clause 50(5)(c) of the Code, have regard to an appropriate risk premium when determining the rate of return to be applied.

Ultimately, in considering the matter of risk premiums and contributed assets, it is clear that the decision-making process involves discretion and judgement (to the extent permitted by the statutory framework). The Commission acknowledges that different points of view can be reasonably argued.[92] However, there do not appear to be better estimates or methods available to the Commission at this point in time to account for the risks prevailing at the time of commencement of construction as required under the Code.

Point 5: One Rail Australia (North) noted that the Commission's methodology in the 2015 review adopted a range approach and indicated that a pre-tax rate of return of around 13 percent may have been a reasonable upper bound.

*Response*

As mentioned above, if contributed assets are excluded, a real risk premium of 13.1 percent would result in a result in a pre-tax real rate of return of approximately 14.44 percent (see Appendix D). This outcome is not inconsistent with the Commission's previous comments from 2015, which stated that when contemplating the risks at the time of commencement of construction, a rate of return at or beyond 13.3 percent could be reasonable.[93] A key difference between the current and previous review is that in the current review the inclusion and exclusion of government contributed assets is considered to be linked to the risk at the time of commencement of construction. In contrast, in the previous review, the same rate of return was applied to the asset value both excluding and including contributed assets.[94]

#### 4.3.3.2 Rate of return in the final report

The Commission has adopted the same financial market parameters as adopted in the draft report for the reasons outlined in the section above. This includes a yield of 1.57 percent on 10-year Commonwealth Government Securities (calculated as the 40-day average of the daily observations to 30 June 2021) and a long-term inflation expectations estimate of 2.04 percent derived from the use of inflation-indexed Commonwealth Government Securities. Overall, the pre-tax real rate of return to be adopted for the final report is 2.44 percent (based on contributed assets being included in the asset value).

#### 4.3.3.3 Return on assets calculation

This section calculates the return on new and existing assets for the final report using the pre-tax real rate of return of 2.44 percent. The return on assets is calculated as the rate of return multiplied by the value of the asset base (shown earlier in section 4.3.2). Tables 10 and 11 present the summary values below.

Table 10. The calculation of the return on assets on existing assets (December 2014 dollars)

| | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | Total |
|---|---|---|---|---|---|---|
| Real rate return (%) (pre-tax) | 2.44 | | | | | |
| Average asset value ($m) | 1843.1 | 1797.0 | 1751.0 | 1705.0 | 1659.0 | |

92 For example, see Re GasNet Australia (Operations) Pty Ltd [2003] ACompT 6.
93 Commission, *10-year review of revenues – Final report*, pp. 38-39.
94 Commission, *10-year review of revenues – Final report*, pp. 37-40.

| | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | Total |
|---|---|---|---|---|---|---|
| Return on existing assets ($m)[95] | 45.0 | 43.8 | 42.7 | 41.6 | 40.5 | 213.6 |

Table 11. The calculation of the return on new assets (December 2014 dollars)

| | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | Total |
|---|---|---|---|---|---|---|
| Real return (%) (pre-tax) | 2.44 | | | | | |
| Average new asset value ($m) | 28.9 | 38.9 | 48.2 | 57.0 | 64.1 | |
| Return on new assets ($m)[96] | 0.7 | 0.9 | 1.2 | 1.4 | 1.6 | 5.8 |

For existing assets, under option 1, the return on assets remains as it is (as shown in Table 10). Under option 2, however, the return on existing assets is multiplied by 48 percent to account for the distance of the relevant line. This can be seen in Table 12 below. Once the return on existing assets has been calculated, the next step is the allocation of fixed costs between access holders (which is calculated in section 4.3.4).

Table 12. Return on existing assets (December 2014 dollars)

| | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | Total |
|---|---|---|---|---|---|---|
| Option 1 | | | | | | |
| Return – existing assets ($m)[97] | 45.0 | 43.8 | 42.7 | 41.6 | 40.5 | 213.6 |
| Option 2 | | | | | | |
| Return – existing assets ($m)[98] | 21.6 | 21.1 | 20.6 | 20.0 | 19.5 | 102.8 |

For new assets, under option 1, the return on assets in Table 11 is multiplied by share of usage shown earlier in Table 2. Under option 2, however, the return on new assets is multiplied by both 48 percent and by the share of usage for those relevant rail lines (shown earlier in Table 4). Table 13 below presents the results for the calculations. (By way of background, Appendix D provides a step by step calculation of the application of the cost allocation options to the return on new assets.)

Table 13. Return on new assets (December 2014 dollars)

| | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | Total |
|---|---|---|---|---|---|---|
| Option 1 | | | | | | |
| Return – new assets ($m) | 0.3 | 0.3 | 0.2 | 0.2 | 0.6 | 1.7 |
| Option 2 | | | | | | |
| Return – new assets ($m) | 0.2 | 0.2 | 0.2 | 0.1 | 0.3 | 1.0 |

95 Calculated as the average asset value multiplied by the pre-tax real rate of return.
96 Calculated as the average new asset value multiplied by the pre-tax real rate of return.
97 These figures are unadjusted, hence match those presented in Table 11.
98 This is calculated as approximately 0.4813 percent multiplied by the return on existing assets in Table 11.

### 4.3.4 Calculating avoidable costs and the contribution to fixed costs

#### 4.3.4.1 Avoidable costs for access holders

As mentioned in section 2.2.1, the avoidable (below-rail) cost is the amount (labour, materials and administration costs) that would not have been incurred if access to rail infrastructure was not sought. Further, it was also noted that, while a return on and of new assets is not in full an avoidable cost, given the minor size of this variable, it is treated as an avoidable cost for simplicity in this review.

In that context, the avoidable costs for access holders where no sustainable competitive price exists are calculated as the sum of operating costs (in Table 3), depreciation of new assets (in Table 9) and return on new assets (in Table 13). Therefore the avoidable costs for non-sustainable below-rail services are: $25.9 million (under option 1) and $15.5 million (under option 2).

The avoidable costs for access holders that are subject to sustainable competitive prices are calculated as the sum of operating costs (in Table 3), depreciation of new assets (in Table 9) and return on new assets (in Table 13). The avoidable costs for these below-rail services are: $60.4 million (under option 1) and $26.1 million (under option 2).

One Rail Australia (North) raised concerns that some operating cost items, such as transport control, maintenance, insurance and certain overheads, do not vary with usage, and it was argued that these items should not be considered avoidable.[99] Recognising that there may be some operating costs that are semi-variable in nature and have fixed cost characteristics, sensitivity analysis has been conducted and the results are presented in section 4.5. It shows that the underlying methodology accounts for total economic costs (whether they be categorised as fixed or avoidable).

#### 4.3.4.2 Contribution to fixed costs

The Code requires that a reasonable contribution to fixed costs be allocated to all access holders. The allocation method adopted in the draft report estimated the contribution to fixed costs from access holders where a sustainable competitive price exists and subtracted it from total fixed costs. The remainder was the contribution to fixed costs where no sustainable competitive price exists.

In response, One Rail Australia (North) argued that the maximum revenue limit would be higher under cost allocation method option 2 if the actual revenue earned from all other access holders was allocated based on the length of the rail infrastructure. The allocation of fixed costs would then be consistent with the apportioning of the costs according to distance of the rail line used.

One Rail Australia (North)'s proposal is in line with the Code[100] and has been adopted for the final report; it results in the revenue earned from other access holders decreasing from $142.8 million to $68.7 million.[101] Without apportioning the revenue earned from all other access holders, the maximum contribution to fixed costs from all other users would be higher than it otherwise should be.

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[99] One Rail Australia (North), p. 10.

[100] The Schedule 2(2)(a) states that, *'R is to be an amount which is not greater than the amount, if any, by which revenues of the access provider attributable to access holders' (other than the access seeker's) usage of the required railway infrastructure required by those access holders exceeds the avoidable costs attributable to those access holders' usage of that required railway infrastructure'.*

[101] $142.8 million multiplied by 0.4813, gives $68.7 million.

The contribution to fixed costs from non-sustainable below-rail services is presented in Table 14.[102] The large difference between the contributions under options 1 and 2 reflects that approximately 48 percent of the rail infrastructure is taken into account under option 2.

Table 14. Calculation of the maximum contribution to fixed costs (December 2014 dollars)[103]

| | Under Option 1 ($m) | Under Option 2 ($m) |
|---|---|---|
| Avoidable costs for all other access holders | 60.4 | 26.1 |
| Total revenues earned from all other access holders[104] | 142.8 | 68.7 |
| *R* (maximum contribution to fixed costs from all other access holders) | 82.4[105] | 42.6[106] |
| Total fixed costs from existing assets | 443.7 | 213.6 |
| **Contribution to fixed costs from non-sustainable below-rail services ($m)** | **361.4**[107] | **170.9**[108] |

## 4.4 Comparing relevant revenues to the estimated maximum revenue limits

The maximum revenue limit of below-rail services that are not subject to sustainable competitive prices was estimated under two alternative cost allocation methodologies (Table 15).

Table 15. Revenues earned compared with the maximum revenue limit (December 2014 dollars) [109]

| | Under Option 1 ($m) | Under Option 2 ($m) |
|---|---|---|
| Avoidable costs for non-sustainable below-rail services | 25.9 | 15.5 |
| Contribution to fixed costs from non-sustainable below-rail services | 361.4 | 170.9 |
| **Maximum revenue limit** | **387.3** | **186.4** |
| **Actual revenues** | **106.2** | **106.2** |
| Extent of under-recovery | (-281.1) | (-80.2) |

- The first option, which assumes that the entire rail line is used by those not subject to sustainable competitive prices, results in a maximum revenue limit of $387.3 million.

[102] The calculation estimates the maximum to be recovered from all other access holders (as shown in the table's variable named *R*). The calculation then subtracts *R* from the total relevant fixed costs of the asset (the latter being the sum of the return on and of assets, as shown earlier in Tables 8 and 12).
[103] Data may not sum due to rounding.
[104] Data were provided by One Rail Australia (North) in nominal terms. They have been converted into December 2014 dollars.
[105] $142.8 million minus $60.4 million, gives $82.4 million.
[106] $68.7 million minus $26.1 million, gives $42.6 million.
[107] $443.7 million minus $83 million, gives $361.4 million.
[108] $213.6 million minus $42.6 million, gives $170.9 million.
[109] Data may not sum due to rounding.

- The second option, which assumes that freight not subject to sustainable competitive prices would travel only on the shortest route to port, results in a maximum revenue limit of $186.4 million.

The key difference between these two options reflects that under option 2 only 48 percent of the rail infrastructure is included in the calculation of the maximum revenue limit.

## 4.5 Summary of sensitivity analysis

The Commission has conducted sensitivity analysis on the following methodological elements.

- The inclusion and exclusion of contributed assets and related risk premiums.[110]
- The financial market parameters as of June 2018 and June 2021.[111]
- The potential for an upward adjustment to option 2 for the usage of the rail line between Wirrida and Tennant Creek to transport mineral ore.[112]
- The potential for an adjustment to option 2 for depreciation of existing rail line between Wirrida and Tennant Creek (as a form of proxy to represent potential option value derived by access holders) (in effect, this is just including existing depreciation for 100 percent of assets in the calculation).
- The potential for an adjustment to option 2 for both the usage of the rail line between Wirrida and Tennant Creek to transport mineral ore, *and* for depreciation of existing rail line between Wirrida and Tennant Creek.[113]
- The potential for an adjustment to option 2 for the treatment of semi-variable operating costs as fixed costs (which, as shown below, has no material impact on the results).[114]

The scenarios are simple, albeit imperfect, methods of quantifying issues raised in One Rail Australia (North)'s submission. Each scenario is discrete – except for one scenario that combines both usage between Wirrida to Tennant Creek and depreciation of Wirrida to Tenant Creek assets. In all scenarios, the revenues earned for below-rail services (of $106.2 million) are well below the maximum revenue limits calculated (of which the results range from $186 million to $670 million) (see Table 16 below for the results). Unsurprisingly, the results are highly sensitive to the asset valuation, rate of return and

[110] The roll-forward of the asset base excluding contributed assets is outlined in Appendix D.

[111] The financial markets data are as follows. June 2021: 1.57 percent for the yield on nominal 10-year Commonwealth Government Securities, estimated as the 40 day average of observations up to 30 June 2021, and 2.04 percent for the measure of long-term inflation expectations derived from indexed Commonwealth Government Securities, based on the June quarter 2021. June 2018: 2.7 percent for the yield on nominal 10-year Commonwealth Government Securities, estimated as the 40 day average of observations up to 30 June 2018, and 1.98 percent for the measure of long-term inflation expectations derived from indexed Commonwealth Government Securities, based on the June quarter 2018.

[112] 20 percent of transport on the line between Wirrida and Tennant Creek is assumed to have no sustainable competitive price. The additional share of usage is calculated as: 0.2 (20 percent) multiplied by 0.52 (52 percent), which gives approximately 0.11. This has been added to 0.48 (48 percent), giving 0.59 (59 percent), to be used as the cost allocation portion in this scenario. Essentially, this adjustment assumption means that 59 percent is used in this scenario to calculate shares of operating costs, return on new and existing assets, and the depreciation of existing and new assets.

[113] Essentially, this means applying an assumption of 59 percent to calculate shares of operating costs, the return on new and existing assets, depreciation of new assets, but in addition, it means including 100 percent of the depreciation of existing assets.

[114] In this scenario, it is assumed that 50 percent of the following expense items (linehaul & operating costs, maintenance and general administration) are fixed; 100 percent of insurance fees and derailment costs are considered to be fixed; and 100 percent of taxes are considered to be variable.

cost allocation method adopted. Each scenario is based on the DORC asset value, either including or excluding contributed assets. Detailed calculation tables for the sensitivity analysis can be viewed in Appendix D.

Table 16. Summary of sensitivity analysis - Estimated maximum revenue limits (December 2014 dollars)[115]

| | Maximum revenue limit ($m) | | | |
|---|---|---|---|---|
| | Including contributed assets but adopting a real risk premium of 2.6 percent | | Excluding contributed assets and adopting a real risk premium of 13.1 percent[116] | |
| | *Pre-tax real rate of return June 2021* *(2.44%)* | *Pre-tax real rate of return June 2018* *(3.78%)* | *Pre-tax real rate of return June 2021* *(14.44%)* | *Pre-tax real rate of return June 2018* *(15.78%)* |
| Option 1 ($m) | 387 | 508 | 617 | 670 |
| Option 2 ($m) | 186 | 244 | 297 | 322 |
| **Potential adjustments** | | | | |
| Option 2 – if adjusted for usage between Wirrida to Tennant Creek ($m) | 229 | 300 | 364 | 395 |
| Option 2 – if adjusted for depreciation on existing Wirrida to Tennant Creek assets ($m) | 306 | 364 | 348 | 374 |
| Option 2 - if adjusted for both usage between Wirrida to Tennant Creek, and depreciation of Wirrida to Tenant Creek assets ($m) | 323 | 394 | 404 | 436 |
| Option 2 – if adjusted for assumptions regarding semi-variable operating costs ($m) | 186 | 244 | 297 | 322 |

[115] Data may not sum due to rounding.

[116] Note that the maximum revenue limits calculated when excluding contributed assets is not symmetrical with the outcome when including contributed assets. In part, this reflects that the (ceiling-price purposes) real risk premium estimated for project funds is calculated using a higher assumed gearing (70 percent rather than 60 percent), a higher asset beta (0.62 rather than 0.55), a debt risk premium of 3.24 percent rather than 1.24 percent, and an uplift factor). Commission, *Tarcoola-Darwin Railway: Regulated Rates of Return*, Provisional Determination, 2003, p. 32.

# 5 Summary

In accordance with Clause 50 of the Code, the Commission undertook a revenue review for the period from 1 July 2013 to 30 June 2018. Its final finding is that, based on the DORC asset value adopted in this review, the relevant below-rail revenues have not been excessive.

The review compared revenues earned for relevant below-rail services with estimates of the maximum revenue limit. The relevant below-rail revenues were identified as those earned from the transport of mineral ores, as this freight does not appear to be subject to sustainable competitive prices. Accordingly, the revenues earned from these below-rail services were included in the five-year review period from 1 July 2013 to 30 June 2018. Those revenues were approximately $106.2 million (in December 2014 dollars). The revenues earned are below the different estimated maximum revenue limits, as calculated under two alternative cost allocation methodologies and risk premiums and returns when including contributed assets.

Given uncertainty surrounding certain factors in the methodology, sensitivity analysis was undertaken. The results indicated that the revenues earned were still well below any of the maximum revenue limits estimated.

In terms of asset valuation, the Commission has noted and considered the submission received, and intends to proceed with its planned discussion paper on the topic of asset valuation in 2022-2023. The discussion paper process will allow One Rail Australia (North), as well as other stakeholders, the opportunity to submit evidence and views on the matter.

# Appendix A: Clause 50 of the Code

50—Review of Code

(1) The Northern Territory Minister and South Australian Minister jointly may, at any time, review the operation of this Code but, in any case, must do so—

(a) firstly, not later than 30 June in the 3rd year of operations of the railway; and

(b) secondly, not later than 12 months before the expiration of the period for which the Commonwealth Minister has specified under section 44N of the Trade Practices Act 1974 of the Commonwealth that the access regime, of which this Code is a part, is to remain in force.

(2) To enable the Ministers to perform their function under sub Clause (1), the regulator must prepare such reports to the Ministers as the Ministers may require. —

(3) The Ministers must, in relation to a review under sub Clause (1)(a) or (b)—

(a)

(i) by notice published in a newspaper circulating generally in Australia, invite interested persons to make submissions in relation to the review within a period stated in the notice; and

(ii) give consideration to any submissions made in response to an invitation under subparagraph (i); and

(b) —

(i) in the case of the Northern Territory Minister—cause a report on the outcome of the review to be laid before the Legislative Assembly of the Northern Territory within 12 sitting days after the completion of the review; and

(ii) in the case of the South Australian Minister—cause a report on the outcome of the review to be laid before both Houses of the South Australian Parliament within 12 sitting days after the completion of the review.

(4) The regulator must, at the intervals referred to in sub Clause (10), review the revenues paid or payable by access holders to the access provider for railway infrastructure services where no sustainable competitive prices exist (relevant revenues), being revenues derived under either:

(a) awards by arbitrators to the extent the awards involve the application of section 2 of the pricing principles; or

(b) access contracts to the extent that the regulator considers sustainable competitive prices did not or do not exist in relation to the transportation of the freight the subject of those access contracts,

and determine whether the relevant revenues paid or payable by such access holders (the relevant access holders) for those railway infrastructure services are excessive having regard to the factors referred to in sub Clause (5).

(5) In determining whether the relevant revenues are excessive the regulator must have regard to the following:

(a) the relevant revenues are to be measured against the costs associated with the required railway infrastructure required by the relevant access holders including an appropriate commercial return on the required railway infrastructure used by the relevant access holders in the circumstances referred to in sub Clause (4) (the relevant required railway infrastructure);

(b) the investment in all of the railway infrastructure facilities by the access provider or any other person and all of the revenues earned by the access provider from the provision of railway infrastructure services including, if the access provider, a related body corporate or an associate has conducted transportation services on the railway, revenues at market rates in relation to those services;

(c) an appropriate commercial return on the relevant required railway infrastructure, determined having regard to—

(i) the appropriate risk premium associated with the construction, development and operation of the railway infrastructure facilities, based on both of the following:

(A) the expected risks prevailing as at the date of commencement of construction of the railway by the access provider; and

(B) in respect of any expansion or extension of the railway after the date of commencement of construction of the railway by the access provider—the expected risks prevailing as at the date of the commencement of construction of that expansion or extension; and

(ii) the relevant financial market rates (including the risk free rate for return on investments and the rate of inflation) prevailing at the time of the regulator's review;

(d) when comparing the relevant revenues to the costs under paragraph (a), the regulator must subtract from those costs an amount determined by the regulator to be the aggregate of—

(i) the avoidable costs attributable to the usage of the relevant required railway infrastructure by all other access holders (being avoidable costs of the kind referred to in section 3 of the pricing principles); and

(ii) a reasonable contribution to fixed costs of the relevant required railway infrastructure (R) from all other access holders using that required railway infrastructure, where R has the same meaning as in section 2(2)(c) of the pricing principles.

(6) The costs to be applied under sub Clause (5) must be efficient.

(7) For the purposes of determining expected risks under sub Clause (5)(c)(i), the regulator must have regard to information provided by the access provider with respect to the contents of any financing plan of the access provider.

(8) If the regulator determines that revenues are excessive under sub Clause (4)—

(a) the regulator must promptly give the access provider written notice of the regulator's determination, including the reasons for his or her determination;

(b) within 2 months of receiving the regulator's determination under paragraph (a), the access provider must prepare and submit to the regulator for approval a plan under which the access provider will reduce future relevant revenues so that such revenues are not excessive (having regard to the matters referred to in sub Clause (5)), when measured over the next regulatory review period (the remedial plan);

(c) the regulator will consider the remedial plan submitted to it with a view to reaching agreement with the access provider on the terms which are acceptable to the regulator for the remedial plan;

(d) if the regulator and the access provider agree on the terms of a remedial plan, the access provider must implement that plan;

(e) if the regulator and the access provider are unable to reach agreement on a remedial plan that is acceptable to the regulator within 1 month of receiving the remedial plan, the regulator must make a determination under subClause (9) and the access provider must observe the terms of that determination.

(9) If sub Clause (8)(e) applies, the regulator will make a determination to regulate prices, and/or to establish conditions relating to prices or price fixing factors in relation to the future provision of railway infrastructure services in any manner the regulator considers appropriate, including—

(a) fixing a price or the rate of increase or decrease in a price;

(b) fixing a maximum price or rate of increase or decrease in a maximum price;

(c) fixing an average price for specified railway infrastructure services or an average rate of increase or decrease in an average price;

(d) specifying pricing policies or principles;

(e) fixing a maximum revenue in relation to railway infrastructure services,

provided the effect of the determination is limited to reducing revenues of the type referred to in paragraphs (a) and (b) of sub Clause (4) derived from railway infrastructure services so that the total of such revenues so derived do not result in excessive revenues (having regard to the matters referred to in sub Clause (5)), when measured over the next regulatory review period.

(10) The regulator's reviews under sub Clause (4) are to be conducted in relation to the following periods:

(a) the first review must be in respect of the period ending on 30 June in the 10th year of operations of the railway;

(b) the second review must be in respect of the 5 year period commencing immediately after the end of the period of the first review; and

(c) the third and subsequent reviews must be in respect of successive 5 year periods.

# Appendix B: Intermodal freight services

Schedule (1)(2)(b) of the Code outlines eleven factors to be considered in any assessment of whether alternative modes of transport provide an effective constraint should have regard to. The table below reproduces HoustonKemp's assessment for intermodal freight in relation to each of the eleven criteria.[117]

Table B1. HoustonKemp's assessment of intermodal (containerised) freight services, reproduced from Table 5.4

| The criteria from Schedule (1)(2)(b) of the Code | HoustonKemp's assessment |
|---|---|
| (i) The number and size of operators in the market | *The number and size of operators in the heavy vehicle sector supports our conclusion that intermodal freight is subject to competition from road freight services. The heavy vehicle sector has a large number of operators across Australia. Our analysis …. shows there have been significant interstate road freight movements along the Tarcoola-Darwin freight corridor, which could have potentially used the Tarcoola-Darwin railway. This indicates that road is a viable alternative and heavy vehicle services are available along the corridor.*<br><br>*There is only one above rail operator operating along the Darwin-Tarcoola railway. We understand from our discussions with stakeholders that other above rail operators have expressed an interest in operating on this line, but none have entered the market. It is unclear why another above rail operator has not entered the market. However, this could be because of the relatively small rail freight volumes along the corridor makes it financially less attractive for another above rail operator to enter into the market.* |
| (ii) The type and volume of freight involved and any unequal backhaul loadings | *We do not expect the volume of freight and any unequal backloading to have a material effect on competition between road and rail along the Tarcoola-Darwin freight corridor. Our analysis … indicates that rail and road both have significant market share of the freight task along the corridor – in 2018-19 road's market share was 62 per cent compared with 38 per cent for rail). Furthermore, unequal backhaul loading appears to exist for both transport modes:*<br><br>*for road freight services, our analysis of ABS data … suggests that there is unequal backhaul loadings between the Northern Territory and its two main interstate destinations, Adelaide and Sydney; and*<br><br>*for rail freight services, our discussions with stakeholders indicate that there is also unequal backhaul loading for rail freight using the Tarcoola-Darwin railway, with more freight northbound than there is southbound.* |
| (iii) Whether there are any regulatory, technical or other practical barriers to entry | *The Commission concluded in its 2015 review that there are minimal barriers to entry for road freight. Our analysis … shows that road freight has gained market share between 2014-2019, which supports the notion that the barriers to entry to the road freight sector are not significant.* |
| (iv) The extent of product differentiation in the market, including the differences in the ancillary services and convenience offered by different modes of transport | *We expect that road freight services would have a competitive advantage over rail freight services from a product differentiation perspective. Transportation via the road network allows for faster door-to-door time and schedule flexibility. As such, rail generally needs to offer lower door to door costs for it to be competitive with road. Furthermore, the investment required to have heavy vehicles as an ancillary service is significantly lower than rail. As such, using heavy vehicles as an ancillary service will be viable for more businesses compared to rail.* |

[117] HoustonKemp, pp. 22-23.

| The criteria from Schedule (1)(2)(b) of the Code | HoustonKemp's assessment |
|---|---|
| (v) The dynamic characteristics of the market including any fluctuations in demand for transportation services | *The changes in market share provides evidence of road rail competition along the corridor. The intermodal freight on the Tarcoola-Darwin railway generally involves the transport of containerised freight between Northern Territory and other capital cities. Our analysis shows that the majority of the interstate containerised freight between Darwin and other southern capital cities is undertaken by road, and rail has been losing market share between 2014 to 2019.* |
| (vi) The costs and service characteristics of transporting freight by different modes of transport | *Our analysis above suggests that road freight services constraints (sic) the below rail service provider's ability to increase access charges. The below rail access provider's ability to increase access charges is further limited by road freight service's (sic) ability to offer faster door-to-door time and schedule flexibility. It follows that rail freight services will likely need to offer lower door-to-door costs to be competitive with road freight services.* |
| (vii) Contractual terms (such as duration and frequency of service, whether for a specific volume or at call) | *The Commission found in its 2015 review that the inter-modal transport market is generally at call. This allows inter-modal freight forwarders to switch transport modes at short notices. We are unaware of any changes that could change the Commission's findings in its 2015 review.* |
| (viii) Congestion and bottleneck inefficiencies caused by constraining points on the road, railway or other relevant infrastructure | *The Commission considered in its 2015 review that neither mode had a significant advantage over the other in this area. We have not identified any evidence that would change the Commission's findings in its 2015 review.* |
| (ix) The safety requirements the different modes of transport are required to meet | *Rail is generally considered to be a safer mode than heavy vehicles. The Commission's 2015 review concluded that safety requirements were unlikely to have a material influence on mode choice between road and rail. We are unaware of any changes that could change the Commission's 2015 findings and we do not expect that this would have a material influence on mode choice between road and rail.* |
| (x) The direct and indirect costs of environmental impacts of the different modes of transport | *Rail is generally considered to be more environmentally friendly than heavy vehicles. The Commission's 2015 review concluded that this was unlikely to have a material influence on mode choice between road and rail. We are unaware of any changes that could change the Commission's 2015 findings and we do not expect that this would have a material influence on mode choice between road and rail.* |
| (xi) Other factors considered to be relevant | *We did not identify any other factors we consider to be relevant.* |

# Appendix C: Contributions to fixed costs

As outlined earlier in Chapters 2 and 4, Clause 50(5)(d) of the Code requires that a reasonable contribution to fixed costs be allocated across all access holders. This review calculates the contribution to fixed costs in accordance with that method. It is noted that in the 2015 review of revenues this type of approach was not used.

The method is based on:

1. a reasonable contribution to fixed costs is to be allocated across access holders, and
2. that in calculating the contribution to fixed costs from freight where no sustainable competitive price exists, the maximum contribution from all other access holders be calculated as the revenue earned by all other access holders *less* the avoidable costs attributable to them.[118]

A simple example illustrates item 2 above. For example, say an access provider earns $125 million for below-rail services where a sustainable competitive price does exist (that is, that is the amount earned from all other access holders). Further, say the avoidable costs of access from all other access holders are $15 million (which reflects the incremental cost of usage such as the labour and capital costs that vary directly with usage). Then when calculating the maximum contribution to fixed costs from all other access holders (known as $R$ in the Code), that contribution cannot exceed $110 million (calculated as $125 million minus $15 million).

The concept of $R$ avoids the situation in which all other access holders would contribute an amount to fixed costs that were not earned from these below-rail services over the period in question.

Under this simple example, the $110 million contribution is the maximum amount of fixed costs that can be attributed to all other access holders. Therefore, if total efficient fixed costs for all access holders were calculated to be $300 million for the period in question, then the contribution to fixed costs for below-rail services where no sustainable competitive price exists must be $190 million (calculated as $300 million minus $110 million).

[118] Schedule (2)(2)(c) of the Code.

# Appendix D: Tables and further calculations

## Rate of return calculations

Steps for calculating the rate of return when contributed assets are included

The nominal post-tax rate of return adopted has been calculated as:

*Nominal post-tax rate of return = (1 + real risk free rate + risk premium)*(1 + expected long-term inflation)*

Substituting in the financial market based parameters and the risk premium, gives:

*Nominal post-tax rate of return = (1-0.47%+2.60%)*(1+2.04%) -1 = 4.22%*

The real post-tax rate of return has been calculated as:

*Real post-tax rate of return = (1+nominal post-tax return) / (1+long-term expected inflation) -1*

Substituting in the nominal post-tax return and long-term expected inflation, gives:

*Real post-tax rate of return = (1+4.22%) / (1+2.04%) -1=2.13%*

The real, post-tax return is converted into a pre-tax return for the purposes of this review, and is done so using 60 percent gearing, a 30% corporate tax rate, and a gamma variable of 50%.[119]

Real pre-tax rate of return = (60% x real, post-tax rate of return) / (1-30%) +

(40% x real, post-tax rate of return x 50%) / (1-30%)

Substituting in the real, post-tax return, gives:

Real pre-tax rate of return = (60% x 2.13%) / (1-30%) + (40% x 2.13% x 50%) / (1-30%) = 2.44%

Steps for calculating when contributed assets are excluded

The nominal post-tax rate of return adopted has been calculated as:

*Nominal post-tax rate of return = (1 + real risk free rate + risk premium)*(1 + expected long-term inflation)*

Substituting in the financial market based parameters and the risk premium, gives:

*Nominal post-tax rate of return = (1-0.47%+13.1%)*(1+2.04%) -1 = 14.93%*

The real post-tax rate of return has been calculated as:

*Real post-tax rate of return = (1+nominal post-tax return) / (1+long-term expected inflation) -1*

Substituting in the nominal post-tax return and long-term expected inflation, gives:

*Real post-tax rate of return = (1+14.93%) / (1+2.04%) -1=12.63%*

The real, post-tax return is converted into a pre-tax return for the purposes of this review, and is done so using 60 percent gearing, a 30% corporate tax rate, and a gamma variable of 50%.

Real pre-tax rate of return = (60% x real, post-tax rate of return) / (1-30%) +

[119] These assumptions are consistent with the Commission's 2003 determination in relation to risks prevailing at the time of commencement of construction of the rail line. Commission, *Tarcoola-Darwin Railway: Regulated Rates of Return*, Provisional Determination, 2003, pp. 23-33.

(40% x real, post-tax rate of return x 50%) / (1-30%)

Substituting in the real, post-tax return, gives:

Real pre-tax rate of return = (60% x 12.63%) / (1-30%) + (40% x 12.63% x 50%) / (1-30%) = 14.44%

## The calculation of operating costs under options 1 and option 2[120]

Steps for calculating operating costs under cost allocation option 1.

1. Convert One Rail Australia (North)'s nominal operating costs into real terms.

Table D1. Operating costs

| | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | Total |
|---|---|---|---|---|---|---|
| Nominal costs ($m) | 16.1 | 15.9 | 15.4 | 14.0 | 14.4 | 76.0 |
| Costs in December 2014 dollars ($m) | 16.4 | 15.9 | 15.2 | 13.6 | 13.7 | 74.9 |

2. Multiply the real operating cost figures by the estimated percentage share of usage where no sustainable competitive prices exist. For example, for 2013-14, 42 percent is multiplied by $16.4 million and gives approximately $6.8 million.

Table D2. Estimated share of usage and operating costs

| | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 |
|---|---|---|---|---|---|
| No sustainable competitive prices share of freight (%) | 42 | 33 | 18 | 17 | 40 |
| Operating costs for freight where no sustainable competitive prices exist ($m) – weighted by share of usage | 6.8 | 5.2 | 2.7 | 2.4 | 5.5 |

Steps for calculating operating costs under cost allocation option 2.

1. As above, convert One Rail Australia (North)'s nominal operating costs into real terms.

Table D3. Operating costs

| | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | Total |
|---|---|---|---|---|---|---|
| Nominal costs ($ million) | 16.1 | 15.9 | 15.4 | 14.0 | 14.4 | 76.0 |
| Costs in December 2014 dollars ($ million) | 16.4 | 15.9 | 15.2 | 13.6 | 13.7 | 74.9 |

2. Calculate the relevant distance of the rail infrastructure. For example, the distance from Wirrida to Tarcoola is approximately 130 kilometres, and the distance from Tennant Creek to Darwin is approximately 950 kilometres. This is a total of 1,078 kilometres, approximately 48 percent of the total Tarcoola to Darwin rail line.

[120] Numbers might not add due to rounding. When presented in dollars, the figures are in December 2014 dollars.

3. Calculate the share of usage in GTK terms *only* for the relevant (48 percent) of the rail line infrastructure.

    a. Calculate the annual amount of volume transported between Tennant Creek and Darwin, and between Tarcoola and Tennant Creek, for both freight with no sustainable competition and total freight. This is informed by KGTK volume information provided by One Rail Australia (North). The difference between the volumes for total freight and freight where no sustainable competitive price exists gives the volume transported for all other access holders.

    b. Calculate the average gross weight for the rail line segment between Tarcoola and Tennant Creek. This is calculated by dividing the KGTK volume measure by the distance between Tennant Creek and Tarcoola (ie approximately 1,292 kilometres).

    c. Apply the average gross weight for the line segment between Tarcoola and Tennant Creek to the distance between Wirrida and Tarcoola (ie approximately 130 kilometres). This gives an estimated volume measure (in KGTK terms) for the rail line segment between Wirrida and Tarcoola.

    d. Combine the transport volumes for the line segments (Tennant Creek to Darwin and Wirrida to Tarcoola), and calculate the estimated share of freight where no sustainable competitive prices exist on these rail line segments.

Table D4. Usage by rail line segment[121]

| | Identifier / calculation | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 |
|---|---|---|---|---|---|---|
| Step (a) | | | | | | |
| Tennant Creek to Darwin, KGTK, no sustainable competitive prices | E | 1964064 | 1526895 | 758185 | 423299 | 1148751 |
| Tennant Creek to Darwin, KGTK, total freight | F | 3719293 | 3325033 | 2510933 | 2059921 | 2637268 |
| Tennant Creek to Darwin, KGTK, all other access holders | G = F - E | 1755229 | 1798138 | 1752748 | 1636622 | 1488517 |
| Tarcoola to Tennant Creek, KGTK, no sustainable competitive prices | H | 1230687 | 724604 | 188290 | 438308 | 941771 |
| Tarcoola to Tennant Creek, KGTK, total freight | I | 3953001 | 3510816 | 2880379 | 2922363 | 2592081 |
| Tarcoola to Tennant Creek, KGTK, all other access holders | J = I - H | 2722314 | 2786212 | 2692089 | 2484055 | 1650310 |
| Step (b) | | | | | | |

[121] Numbers might not necessarily total due to rounding.

| | Identifier / calculation | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 |
|---|---|---|---|---|---|---|
| Tennant Creek to Darwin, gross weight, no sustainable competitive prices | K = H/1291.7 | 953 | 561 | 146 | 339 | 729 |
| Tennant Creek to Darwin, gross weight, total freight | L = I/1291.7 | 3060 | 2718 | 2230 | 2263 | 2007 |
| Tennant Creek to Darwin, gross weight, all other access holders | M = J/1291.7 | 2108 | 2157 | 2084 | 1923 | 1278 |
| Step (c) | | | | | | |
| Wirrida to Tarcoola, KGTK, no sustainable competitive prices | N = 130.15 x K | 124007 | 73013 | 18973 | 44165 | 94895 |
| Wirrida to Tarcoola, KGTK, total freight | O = 130.15 x L | 398315 | 353759 | 290234 | 294465 | 261185 |
| Wirrida to Tarcoola, KGTK, all other access holders | P = 130.15 x M | 274307 | 280746 | 271262 | 250300 | 166290 |
| Step (d) | | | | | | |
| No sustainable competitive prices share of freight for relevant lines (%) | = (E+N) / (F+O) | 51 | 43 | 28 | 20 | 43 |

4. Multiply the operating cost figures by the distance of the relevant rail lines (48 percent) and by the percentage share of usage by freight where no sustainable competitive prices exist for the relevant lines. For example, for 2013-14, 48 percent multiplied by $16.4 million multiplied by 51 percent gives $4.0 million.

Table D5. Share of usage and operating costs

| | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | Total |
|---|---|---|---|---|---|---|
| Line section share - constant (%) | 48 | 48 | 48 | 48 | 48 | |
| No sustainable competitive prices share of freight (%) | 51 | 43 | 28 | 20 | 43 | |
| Operating costs for freight where no sustainable competitive prices exist ($m) – weighted by share of usage | 4.0 | 3.3 | 2.0 | 1.3 | 2.8 | 13.5 |

## The calculation of returns on and of *new* assets under options 1 and 2

Steps for calculating depreciation of new assets and a return on new assets under cost allocation option 1.

1. Estimate the unweighted total figure of the depreciation of new assets and return on new assets, as outlined in the tables above.

Table D6. Return on new assets and depreciation of new assets – unweighted

| | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | Total |
|---|---|---|---|---|---|---|
| Return – new assets ($m) | 0.7 | 0.9 | 1.2 | 1.4 | 1.6 | 5.8 |
| Depreciation – new assets ($m) | 0.7 | 0.9 | 1.2 | 1.3 | 1.5 | 5.7 |

2. Multiple these figures by the percentage share of usage by freight where no sustainable competitive prices exist. For example, for 2013-14, 42 percent is multiplied by $0.7 million and gives approximately $0.3 million.

Table D7. Return on new assets and depreciation of new assets –adjusted according to share of usage

| | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 |
|---|---|---|---|---|---|
| No sustainable competitive prices share of freight (%) | 42 | 33 | 18 | 17 | 40 |
| Return – new assets ($m) | 0.3 | 0.3 | 0.2 | 0.2 | 0.6 |
| Depreciation – new assets ($m) | 0.3 | 0.3 | 0.2 | 0.2 | 0.6 |

Steps for calculating depreciation of new assets and a return on new assets under cost allocation option 2.

1. Estimate the unweighted total figure of the depreciation of new assets and return on new assets, as outlined in the tables above.

Table D8. Return on new assets and depreciation of new assets – unweighted

| | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | Total |
|---|---|---|---|---|---|---|
| Return – new assets ($m) | 0.7 | 0.9 | 1.2 | 1.4 | 1.6 | 5.8 |
| Depreciation – new assets ($m) | 0.7 | 0.9 | 1.2 | 1.3 | 1.5 | 5.7 |

2. Multiply these figures by the distance of the relevant rail line segments (48 percent) and the percentage share of usage by freight where no sustainable competitive prices exist on these relevant rail lines. For example, for 2013-14, a return of $0.7 million is multiplied by 48 percent and 51 percent gives approximately $0.2 million.

Table D9. Return on new assets and depreciation of new assets –adjusted according to distance and share of usage for rail line segment

| | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 |
|---|---|---|---|---|---|
| Line section share - constant (%) | 48 | 48 | 48 | 48 | 48 |
| GTK – non – sustainable % of relevant line | 51 | 43 | 28 | 20 | 43 |
| Return on new assets ($m) | 0.2 | 0.2 | 0.2 | 0.1 | 0.3 |
| Depreciation – new assets ($m) | 0.2 | 0.2 | 0.2 | 0.1 | 0.3 |

## Sensitivity analysis – potential adjustments to option 2 method[122]

1. The first sensitivity analysis scenario is an adjustment that apportions the excluded rail infrastructure by the share of the gross weight of trains transporting mineral ore on that rail line segment. Essentially, it alters the rail line segment share in the option 2 method to be calculated from 48 percent to 59 percent.

Table D10: If adjusted for usage between Wirrida to Tennant Creek ($m)

| If adjusted for usage between Wirrida to Tennant Creek ($m) | Identifier/ Calculation | Including contributed assets but adopting a real risk premium of 2.6 percent | | Excluding contributed assets and adopting a real risk premium of 13.1 percent | |
|---|---|---|---|---|---|
| | | *Pre-tax real rate of return June 2021 (2.44%)* | *Pre-tax real rate of return June 2018 (3.78%)* | *Pre-tax real rate of return June 2021 (14.44%)* | *Pre-tax real rate of return June 2018 (15.78%)* |
| Avoidable costs for all other access holders | A = B+C+D | 32.0 | 33.2 | 42.8 | 44.0 |
| ➢ Operating costs | B | 27.6 | 27.6 | 27.6 | 27.6 |
| ➢ Return on new assets | C | 2.2 | 3.4 | 13.1 | 14.2 |
| ➢ Depreciation on new assets | D | 2.2 | 2.2 | 2.2 | 2.2 |
| Total revenues earned from all other access holders[123] | E | 84.2 | 84.2 | 84.2 | 84.2 |
| *R* (maximum contribution to fixed costs from all other access holders) | F = E - A | 52.2 | 51.0 | 41.4 | 40.2 |
| Total fixed costs from existing assets | H = I+J | 261.8 | 331.0 | 380.1 | 410.0 |
| ➢ Return on existing assets (adjusted for distance)[124] | I | 126.0 | 195.3 | 321.6 | 351.4 |

[122] Numbers may not add due to rounding.
[123] This is calculated by multiplying $142.8m (total revenue earned by all other access holders) by line share (0.59).
[124] Calculation: (average existing asset value x WACC)*(0.59).

| If adjusted for usage between Wirrida to Tennant Creek ($m) | Identifier/ Calculation | Including contributed assets but adopting a real risk premium of 2.6 percent | | Excluding contributed assets and adopting a real risk premium of 13.1 percent | |
|---|---|---|---|---|---|
| ➢ Depreciation on existing assets (adjusted for distance)[125] | J | 135.8 | 135.8 | 58.5 | 58.5 |
| **Contribution to fixed costs from non-sustainable below-rail services ($m)** | **K = H - F** | **209.6** | **280.0** | **338.7** | **369.8** |
| Avoidable costs for non-sustainable below-rail services | L = M+N+O | 18.9 | 19.6 | 24.9 | 25.5 |
| ➢ Operating costs–non-sustainable[126] | M | 16.6 | 16.6 | 16.6 | 16.6 |
| ➢ Return on new assets[127] | N | 1.2 | 1.9 | 7.1 | 7.8 |
| ➢ Depreciation on new assets[128] | O | 1.2 | 1.2 | 1.2 | 1.2 |
| **Maximum revenue limit** | **P = K+L** | **228.5** | **299.6** | **363.6** | **395.3** |

2. The second sensitivity analysis scenario adjusts for depreciation of existing rail line assets between Wirrida and Tennant Creek. In effect, this is includes depreciation for 100 percent of existing assets (rather than 48 percent).

Table D11. If adjusted for depreciation on existing Wirrida to Tennant Creek assets ($m)

| If adjusted for depreciation on existing Wirrida to Tennant Creek assets ($m) | Identifier/ Calculation | Including contributed assets but adopting a real risk premium of 2.6 percent | | Excluding contributed assets and adopting a real risk premium of 13.1 percent | |
|---|---|---|---|---|---|
| | | *Pre-tax real rate of return June 2021 (2.44%)* | *Pre-tax real rate of return June 2018 (3.78%)* | *Pre-tax real rate of return June 2021 (14.44%)* | *Pre-tax real rate of return June 2018 (15.78%)* |
| Avoidable costs for all other access holders | A = B+C+D | 26.1 | 27.1 | 34.9 | 35.9 |
| ➢ Operating costs | B | 22.5 | 22.5 | 22.5 | 22.5 |
| ➢ Return on new assets | C | 1.8 | 2.8 | 10.7 | 11.6 |
| ➢ Depreciation on new assets | D | 1.8 | 1.8 | 1.8 | 1.8 |

[125] Calculation: (annual existing asset depreciation)*(0.59). Annual existing asset depreciation is calculated as the average of the opening and closing value each year, divided by the remaining asset life in that year, noting that the asset life is set at 50 years starting in 2003-2004.
[126] Calculation: (total operating costs)*(GTK non-sustainable percentage of the relevant line)*(0.59).
[127] Calculation: (average new asset value x WACC)*(GTK non-sustainable percentage of the relevant line)*(0.59).
[128] Calculation: (annual depreciation of new assets)*(GTK non-sustainable percentage of the relevant line)*(0.59).

| If adjusted for depreciation on existing Wirrida to Tennant Creek assets ($m) | Identifier/ Calculation | Including contributed assets but adopting a real risk premium of 2.6 percent | | Excluding contributed assets and adopting a real risk premium of 13.1 percent | |
|---|---|---|---|---|---|
| Total revenues earned from all other access holders | E | 68.7 | 68.7 | 68.7 | 68.7 |
| *R* (maximum contribution to fixed costs from all other access holders) | F = E - A | 42.6 | 41.6 | 33.8 | 32.8 |
| Total fixed costs from existing assets | H = I+J | 333.0 | 389.4 | 361.5 | 385.9 |
| ➢ Return on existing assets (adjusted for distance) | I | 102.8 | 159.3 | 262.3 | 286.7 |
| ➢ Depreciation on existing assets (adjusted for distance) | J | 230.2 | 230.2 | 99.2 | 99.2 |
| **Contribution to fixed costs from non-sustainable below-rail services ($m)** | **K = H - F** | **290.3** | **347.8** | **327.7** | **353.1** |
| Avoidable costs for non-sustainable below-rail services | L = M+N+O | 15.5 | 16.0 | 20.3 | 20.8 |
| ➢ Operating costs – non-sustainable | M | 13.5 | 13.5 | 13.5 | 13.5 |
| ➢ Return on new assets | N | 1.0 | 1.5 | 5.8 | 6.4 |
| ➢ Depreciation on new assets | O | 1.0 | 1.0 | 1.0 | 1.0 |
| **Maximum revenue limit** | **P = K+L** | **305.8** | **363.7** | **348.0** | **373.9** |

3. The third sensitivity analysis scenario combines, in effect, the first two scenarios. The rail line segment share is 59 percent to account for usage between Wirrida and Tennant Creek, and at the same time 100 percent of depreciation for existing assets is included.

Table D12: If adjusted for both usage between Wirrida to Tennant Creek and depreciation of Wirrida to Tenant Creek assets ($m)

| If adjusted for usage between Wirrida to Tennant Creek, and depreciation of assets ($m) | Identifier/ Calculation | Including contributed assets but adopting a real risk premium of 2.6 percent | | Excluding contributed assets and adopting a real risk premium of 13.1 percent | |
|---|---|---|---|---|---|
| | | *Pre-tax real rate of return June 2021* *(2.44%)* | *Pre-tax real rate of return June 2018* *(3.78%)* | *Pre-tax real rate of return June 2021* *(14.44%)* | *Pre-tax real rate of return June 2018* *(15.78%)* |
| Avoidable costs for all other access holders | A = B+C+D | 32.0 | 33.2 | 42.8 | 44.0 |
| ➢ Operating costs | B | 27.6 | 27.6 | 27.6 | 27.6 |
| ➢ Return on new assets | C | 2.2 | 3.4 | 13.1 | 14.2 |
| ➢ Depreciation on new assets | D | 2.2 | 2.2 | 2.2 | 2.2 |
| Total revenues earned from all other access holders | E | 84.2 | 84.2 | 84.2 | 84.2 |
| *R* (maximum contribution to fixed costs from all other access holders) | F = E - A | 52.3 | 51.1 | 41.4 | 40.2 |
| Total fixed costs from existing assets | H = I+J | 356.2 | 425.3 | 420.8 | 450.6 |
| ➢ Return on existing assets (adjusted for distance) | I | 126.0 | 195.1 | 321.6 | 351.4 |
| ➢ Depreciation on existing assets (adjusted for distance) | J | 230.2 | 230.1 | 99.2 | 99.2 |
| **Contribution to fixed costs from non-sustainable below-rail services ($m)** | **K = H - F** | **303.9** | **374.2** | **379.4** | **410.4** |
| Avoidable costs for non-sustainable below-rail services | L = M+N+O | 18.9 | 19.6 | 24.9 | 25.5 |
| ➢ Operating costs – non-sustainable | M | 16.6 | 16.6 | 16.6 | 16.6 |
| ➢ Return on new assets | N | 1.2 | 1.9 | 7.1 | 7.8 |
| ➢ Depreciation on new assets | O | 1.2 | 1.2 | 1.2 | 1.2 |
| **Maximum revenue limit** | **P = K+L** | **322.9** | **394.0** | **404.2** | **436.0** |

4. The fourth sensitivity analysis scenario separates operating expenses into fixed and variable cost components. Specifically, 50 percent of linehaul & operating costs, maintenance and general administration costs are treated as fixed costs. 100 percent of insurance fees and derailment costs are considered to be fixed costs. All tax expenses are considered to be variable costs.

Table D13: If adjusted for semi-variable operating costs ($m)

| If adjusted for usage between Wirrida to Tennant Creek, and depreciation of assets ($m) | Identifier/ Calculation | Including contributed assets but adopting a real risk premium of 2.6 percent | | Excluding contributed assets and adopting a real risk premium of 13.1 percent | |
|---|---|---|---|---|---|
| | | *Pre-tax real rate of return June 2021* *(2.44%)* | *Pre-tax real rate of return June 2018* *(3.78%)* | *Pre-tax real rate of return June 2021* *(14.44%)* | *Pre-tax real rate of return June 2018* *(15.78%)* |
| Avoidable costs for all other access holders | A = B+C+D | 12.3 | 13.3 | 21.2 | 22.2 |
| ➢ Operating costs | B | 8.8 | 8.8 | 8.8 | 8.8 |
| ➢ Return on new assets | C | 1.8 | 2.8 | 10.6 | 11.6 |
| ➢ Depreciation on new assets | D | 1.8 | 1.8 | 1.8 | 1.8 |
| Total revenues earned from all other access holders | E | 68.7 | 68.7 | 68.7 | 68.7 |
| *R* (maximum contribution to fixed costs from all other access holders) | F = E - A | 56.4 | 55.4 | 47.5 | 46.5 |
| Total fixed costs from existing assets | H = I+J | 235.7 | 292.1 | 332.2 | 356.5 |
| ➢ Return on existing assets (adjusted for distance) | I | 102.8 | 159.3 | 262.3 | 286.7 |
| ➢ Depreciation on existing assets (adjusted for distance) | J | 110.8 | 110.8 | 47.8 | 47.8 |
| ➢ Semi-operating costs (treated as fixed cost) | K | 22.1 | 22.1 | 22.1 | 22.1 |
| **Contribution to fixed costs from non-sustainable below-rail services ($m)** | **L = H - F** | **179.3** | **236.6** | **284.6** | **310.0** |
| Avoidable costs for non-sustainable below-rail services | M = N+O+P | 7.1 | 7.7 | 11.9 | 12.5 |
| ➢ Operating costs – non-sustainable | N | 5.2 | 5.2 | 5.2 | 5.2 |
| ➢ Return on new assets | O | 1.0 | 1.5 | 5.7 | 6.4 |
| ➢ Depreciation on new assets | P | 1.0 | 1.0 | 1.0 | 1.0 |
| **Maximum revenue limit** | **Q = L+M** | **186.4** | **244.3** | **296.6** | **322.4** |

## Asset roll-forward from 2003-2004 to 2017-2018 – Including contributed assets

Table D14. Asset roll-forward from 2003-2004 to 2017-2018 (December 2014 dollars)

| | First review period | | | | | | | | | | Current review period | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *2003-04* | *2004-05* | *2005-06* | *2006-07* | *2007-08* | *2008-09* | *2009-10* | *2010-11* | *2011-12* | *2012-13* | *2013-14* | *2014-15* | *2015-16* | *2016-17* | *2017-18* |
| Opening asset value | 2301.4 | 2280.3 | 2234.3 | 2190.1 | 2146.7 | 2105.2 | 2060.4 | 2015.0 | 1972.0 | 1932.1 | 1889.6 | 1854.3 | 1817.5 | 1780.9 | 1743.1 |
| Capital expenditure | 0.0 | 0.0 | 1.8 | 2.7 | 4.7 | 1.5 | 0.9 | 3.3 | 6.6 | 4.1 | 11.5 | 10.1 | 10.6 | 9.6 | 7.3 |
| Disposals | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Indexation | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Depreciation | 21.1 | 46.0 | 46.1 | 46.1 | 46.2 | 46.2 | 46.3 | 46.3 | 46.5 | 46.5 | 46.8 | 47.0 | 47.2 | 47.4 | 47.5 |
| Closing asset value | 2280.3 | 2234.3 | 2190.1 | 2146.7 | 2105.2 | 2060.4 | 2015.0 | 1972.0 | 1932.1 | 1889.6 | 1854.3 | 1817.5 | 1780.9 | 1743.1 | 1702.9 |

## Asset roll-forward from 2003-2004 to 2017-2018 – Excluding contributed assets

The starting value when excluding contributed assets is $992.2 million.[129] This reflects the $2,301 million DORC value minus $729 million (to account for the Tarcoola to Alice Springs line) and minus the $580 million of state contributions to the Alice Springs to Darwin rail line.

Table D15. Asset roll-forward from 2003-2004 to 2017-2018 (December 2014 dollars)

| | First review period | | | | | | | | | | Current review period | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *2003-04* | *2004-05* | *2005-06* | *2006-07* | *2007-08* | *2008-09* | *2009-10* | *2010-11* | *2011-12* | *2012-13* | *2013-14* | *2014-15* | *2015-16* | *2016-17* | *2017-18* |
| Opening asset value | 992.2 | 983.1 | 963.3 | 945.2 | 928.0 | 912.7 | 894.1 | 874.9 | 858.1 | 844.3 | 828.1 | 818.9 | 808.3 | 797.9 | 786.3 |
| Capital expenditure | 0.0 | 0.0 | 1.8 | 2.7 | 4.7 | 1.5 | 0.9 | 3.3 | 6.6 | 4.1 | 11.5 | 10.1 | 10.6 | 9.6 | 7.3 |
| Disposals | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Indexation | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Depreciation | 9.1 | 19.8 | 19.9 | 19.9 | 20.0 | 20.1 | 20.1 | 20.1 | 20.3 | 20.4 | 20.6 | 20.8 | 21.0 | 21.2 | 21.3 |
| Closing asset value | 983.1 | 963.3 | 945.2 | 928.0 | 912.7 | 894.1 | 874.9 | 858.1 | 844.3 | 828.1 | 818.9 | 808.3 | 797.9 | 786.3 | 772.3 |

[129] Commission, *10-year review of revenues – Final report*, August 2015, p. 34.


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