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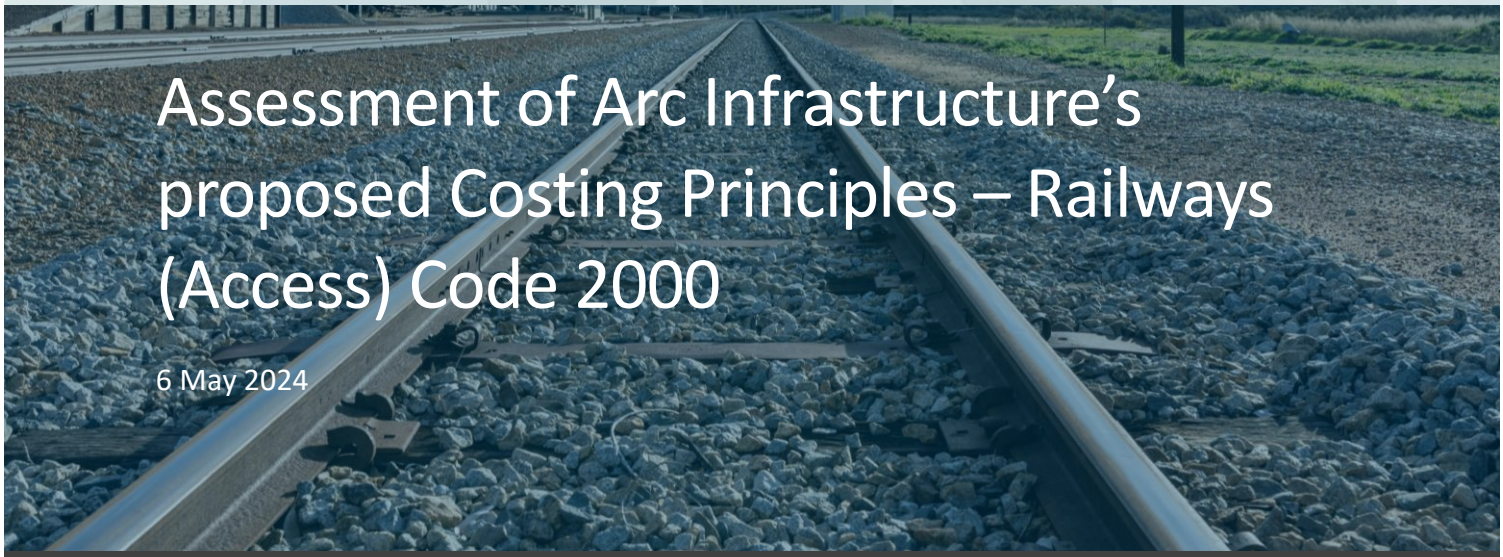

Assessment of Arc Infrastructure's proposed Costing Principles – Railways (Access) Code 2000

6 May 2024

A Marsden Jacob Report

Prepared for Economic Regulation Authority, Western Australia

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MARSDEN JACOB ASSOCIATES

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Acronyms

Acronym	Definition
ARTC	Australian Rail Track Corporation
CPI	Consumer Price Index
DORC	Depreciated Optimised Replacement Cost
GTK	Gross Tonne Kilometre
MEA	Modern Equivalent Asset
Initial RAB	Initial Regulatory Asset Base
RAB	Regulatory Asset Base
Updated RAB	Updated Regulatory Asset Base
WACC	Weighted Average Cost of Capital

1. Executive Summary

In this report, Marsden Jacob has assessed the Draft Costing Principles submitted by Arc Infrastructure to the Economic Regulation Authority (ERA) in March 2024. The Costing Principles are a statement of principles, rules and practices (the 'Costing Principles' or '2024 Costing Principles') that are to be applied in developing costs to be used as part of negotiations between the rail infrastructure owner and an access seeker.

This assessment has focused on assessing whether the Costing Principles are sufficient and appropriately specified to enable ERA and access seekers to make a proper assessment against the requirements of the *Railways (Access) Code 2000*. Marsden Jacob has done this by using three questions, where relevant, to assess each component of Sections 47H (1) and (2) of the Code:

- Has Arc Infrastructure specified sufficient information in the Costing Principles that meets the obligations of the Code?
- Are the Costing Principles sufficiently aligned with accepted regulatory practice?
- Are there are any inconsistencies or confusing wording in the Costing Principles?

In examining these questions, we have identified instances where Arc Infrastructure's Costing Principles either do not meet the requirements of Sections 47H (1) and (2) of the Code or could better meet the requirements of these sections of the Code. Marsden Jacob has also, where appropriate, suggested appropriate and practical alternative measures which would meet the requirements of the Code in respect of those elements.

In each section of our report we also provide relevant feedback from three submissions to the ERA on the Draft Costing Principles and relate it to our recommendations as appropriate. These submissions are:

- CBH Group, submission dated 19 April 2024 ('CBH')
- Aurizon, submission dated 19 April 2024 ('Aurizon')
- Pacific National, submission dated 19 April 2024 ('Pacific National').

Marsden Jacob also notes that it has had the opportunity to meet with Arc Infrastructure on two occasions and, where appropriate, issues that were discussed are described in our report.

Marsden Jacob also notes that an explanatory supporting document was submitted by Arc Infrastructure (dated 1 May 2024). Our report incorporates this additional information into our report, where appropriate.

2. Introduction

2.1 Background to WA rail access code and Costing Principles

The *Railways (Access) Code 2000* ('Code') provides a process for the negotiation of access agreements between the railway owner and the entity seeking access, the arbitration of disputes during the course of such negotiations and the regulator's role in this process.

The Code contains specific provisions for how economic costs are to be developed to support this negotiation process. One component of the Code requires the railway owner to submit to the ERA a statement of principles, rules and practices (the 'Costing Principles' or '2024 Costing Principles') that are to be applied in developing costs. Specifically, Sections 47H (1) and (2) states the following:

> ***47H(1)*** *Each railway owner must prepare and submit to the Regulator a statement of the principles, rules and practices (the costing principles) that are to be applied and followed by the railway owner –*
>
> *(a) when determining the depreciated optimised replacement cost of applicable railway infrastructure under section 47J(1)(a); and*
>
> *(b) when determining the updated regulatory asset base of applicable railway infrastructure under section 47N(1); and*
>
> *(c) when determining the costs referred to in Schedule 4 clauses 7 and 8; and*
>
> *(d) in the keeping and presentation of the railway owner's accounts and financial records so far as they relate to the determination of those costs.*
>
> ***47H(2)*** *The statement must*
>
> *(a) specify the route sections into which each applicable part of the railways network is divided; and*
>
> *(b) describe the intended method for calculating –*
>
> *(i) accumulated depreciation for the purpose of determining the depreciated optimised replacement cost of applicable railway infrastructure under section 47J(1)(a); and*
>
> *(ii) depreciation for the purposes of determining the updated regulatory asset base of applicable railway infrastructure under section 47N(1) and determining the costs referred to in Schedule 4 clauses 7 and 8;*
>
> *(c) specify if assets will be grouped for the purposes of determining the matters referred to in subsection (1)(a) to (c) and, if so, how assets will be grouped; and*
>
> *(d) prohibit any double counting of assets by providing that the sum of the return of capital that is attributable to an asset over its economic life, via depreciation or otherwise, must not exceed the value of the asset at the time at which it is first included in a regulatory asset base; and*
>
> *(e) prohibit the inclusion of the following in relation to contributed capital –*

> *(i) if the contributed capital is funded wholly by an entity other than the railway owner or an associate of the railway owner — the value of the contributed capital;*
>
> *(ii) if the contributed capital is funded in part by an entity other than the railway owner or an associate of the railway owner — the value of the portion of the contributed capital that is not funded by the railway owner or an associate of the railway owner*

Importantly, the Costing Principles provide guidance on how Arc Infrastructure will determine Incremental and Total Costs, referred to in clauses 7 and 8 of Schedule 4 to the Code.

Arc Infrastructure has recently submitted revised Costing Principles (March 2024), which are intended to reflect changes in the Code that was amended on 19th December 2023. As a result, the Costing Principles reflect a range of changes to the Code, such as the replacement of the gross replacement value approach with a depreciated optimised replacement cost (DORC) approach to set a Regulatory Asset Base (RAB).

2.2 What Marsden Jacob was asked to do

Marsden Jacob was engaged to provide an appraisal of Arc Infrastructure's proposed Costing Principles (March 2024). In doing this appraisal, ERA has asked Marsden Jacob to:

- identify instances where Arc Infrastructure's Costing Principles do not meet the requirements of Section 47H (1) and (2) of the Code or could better meet the requirements of these sections of the Code, and
- suggest appropriate and practical alternative measures which would meet the requirements of the Code in respect of those elements.

2.3 Approach to review

Marsden Jacob has examined the Costing Principles proposed by Arc Infrastructure through assessing whether the Costing Principles are sufficient and appropriately specified to enable ERA and access seekers to make a proper assessment against the requirements of the Code. Marsden Jacob has done this by using examining three questions to assess each component of Sections 47H (1) and (2):

- Has Arc Infrastructure specified sufficient information in the Costing Principles that meets the obligations of the Code?
- Are the Costing Principles sufficiently aligned with accepted regulatory practice?
- Are there are any inconsistencies or confusing wording in the Costing Principles?

In some cases, the second and third question are not examined if they are not considered necessary to support our assessment. Also, our assessment for the second question has been assisted by comparisons with three other rail infrastructure systems that have rail access undertakings:

- Hunter Valley coal network access undertaking

- Queensland Rail's access undertaking
- Aurizon Network access undertaking.

The Western Australian rail regulatory framework will have differences to other Australian rail networks and these distinctions are not made within this report. Rather, our focus has been on identifying where regulatory methods and practices that apply elsewhere may have relevance for the Costing Principles.

Additionally, comparisons are made where appropriate with the previous 2020 Costing Principles. This is important since statements made in the 2020 Costing Principles are considered to have been approved by the ERA and may be relevant in assessing the 2024 Costing Principles. However, Marsden Jacob acknowledges that some of the 2020 Costing Principles may not provide appropriate guidance as there have been changes to the Code since when the 2020 Costing Principles were approved by the ERA.

3. Section 47H(1)

3.1 Rail Access Code

The *Railways (Access) Code 2000* Section 47H(1) is shown in Box 1.

Box 1: The Railways (Access) Code 2000 Section 47H(1)

Each railway owner must prepare and submit to the Regulator a statement of the principles, rules and practices (the costing principles) that are to be applied and followed by the railway owner –

(a) when determining the depreciated optimised replacement cost of applicable railway infrastructure under section 47J(1)(a); and

(b) when determining the updated regulatory asset base of applicable railway infrastructure under section 47N(1); and

(c) when determining the costs referred to in Schedule 4 clauses 7 and 8; and

(d) in the keeping and presentation of the railway owner's accounts and financial records so far as they relate to the determination of those costs.

Supporting this is section 47J(1)(a) which states that:

> *47J. Initial regulatory asset base*
>
> *(1) Each railway owner must, within the period that applies under section 47L —*
>
> *(a) determine, for each route section of an applicable part of the railways network, the depreciated optimised replacement cost of applicable railway infrastructure associated with the route section*

Also supporting this is section 47N(1) and 47N(3) which states that:

> *47N. Railway owner to update regulatory asset base*
>
> *(1) A railway owner must, within 60 business days after 30 June of each year, determine the updated regulatory asset base of applicable railway infrastructure associated with each applicable route section.*
>
> *(2) For the purposes of subsection (1), a route section is an applicable route section if the Regulator has approved or determined the depreciated optimised replacement cost of railway infrastructure associated with the route section under section 47J(3).*
>
> *(3) A determination under subsection (1) must be made by —*
>
> *(a) taking the current regulatory asset base of the route section;*
>
> *(b) adding asset indexation over the relevant period of applicable railway infrastructure associated with the route section; and*
>
> *(c) adding the value of capital expenditure incurred by the railway owner during the relevant period in relation to applicable railway infrastructure associated with the route section; and*

(d) deducting depreciation over the relevant period of applicable railway infrastructure associated with the route section, in accordance with the applicable depreciation schedule for the time being approved or determined by the Regulator under section 47K(3); and

(e) deducting the value of railway infrastructure that —

(i) was disposed of by the railway owner or became redundant or stranded during the relevant period; and

(ii) was applicable railway infrastructure associated with the route section immediately prior to being disposed of or becoming redundant or stranded.

Additionally, Schedule 4 clauses 7 and 8 state that:

Floor price test: *7(1) An access holder that is provided with access to a route and associated railway infrastructure must pay for the access not less than the incremental costs resulting from its operations on that route and use of that infrastructure.*

Ceiling price test: 8(1) *An access holder that is provided with access to a route, or part of a route, and associated railway infrastructure must pay for the access not more than the total costs attributable to that route, or that part of the route, and that infrastructure.*

Furthermore, the *Railways (Access) Code 2000* provides the following definitions of key terms (Table 1):

Table 1: Key terms relevant to Section 47H(1)

Term	Section of Code	Definition
Depreciated optimised replacement cost	3	Depreciated optimised replacement cost, in relation to railway infrastructure, means — (a) the lowest current cost to replace the railway infrastructure with assets that — (i) have the capacity to provide the level of service that meets the actual and reasonably projected demand; and (ii) are modern equivalent assets; less (b) accumulated depreciation in accordance with the costing principles for the time being approved or determined by the Regulator under section 47H
Railway infrastructure	3	Railway infrastructure means the facilities necessary for the operation of a railway, including — (a) railway track, associated track structures, over or under track structures, supports (including supports for equipment or items associated with the use of a railway); and (b) tunnels and bridges; and

Term	Section of Code	Definition
		(c) stations and platforms; and (d) train control systems, signalling systems and communication systems; and (e) electric traction infrastructure; and (f) buildings and workshops; and (g) associated plant machinery and equipment, but not including — (h) sidings or spur lines that are excluded by section 3(3) or (4) of the Act from being railway infrastructure; and (i) rolling stock, rolling stock maintenance facilities, office buildings, housing, freight centres, and terminal yards and depots
Double counting	47F(1) 47F(2)	A railway owner must not, when valuing railway infrastructure under or for the purposes of this Code, engage in double counting of assets. A railway owner engages in double counting of assets if the sum of the return of capital that is attributable to an asset over its economic life, via depreciation or otherwise, exceeds the value of the asset at the time at which it is first included in a regulatory asset base.
Applicable railway infrastructure	47(C)	If a railway owner is for the time being the railway owner in relation to a part of the railways network to which this Code applies — (a) that part is an applicable part of the railways network in relation to the railway owner; and (b) railway infrastructure associated with that part is applicable railway infrastructure in relation to the railway owner.
Initial regulatory asset base	47J(7)	The depreciated optimised replacement cost of applicable railway infrastructure associated with a route section approved or determined by the Regulator under subsection (3) (including as amended in accordance with a direction given under section 47M(2)) is the initial regulatory asset base of that route section.
Route section	3	Route section means the sections of the railways network into which the network is divided for management and costing purposes
Incremental costs	Schedule 4 clause 1	Incremental costs, in relation to an access holder or a group of access holders, means the following that the railway owner or an associate would be able to avoid if it were not to provide access to that access holder or group of access holders — (a) the operating costs; (b) where applicable — (i) the capital costs; and

Term	Section of Code	Definition
		(ii) the overheads attributable to the performance of the railway owner's access-related functions whether by the railway owner or an associate
Total costs	Schedule 4 clause 1	Total costs means the total of all — (a) operating costs; (b) capital costs; and (c) the overheads attributable to the performance of the railway owner's access-related functions whether by the railway owner or an associate.
Capital costs	Schedule 4 clause 2	Schedule 4 clause 2(1) Capital costs means the costs comprising both the depreciation and risk-adjusted return on the relevant railway infrastructure. Schedule 4 clause 2(3) Capital costs must be determined as the annual cost of providing the railway infrastructure for each year of the relevant period calculated in accordance with subclause (4). Schedule 4 clause 2(4) The calculation must be made by — (a) multiplying the current regulatory asset base of each relevant route section, which must be updated annually throughout the relevant period, by the weighted average cost of capital appropriate to the railway infrastructure; and (b) adding depreciation in accordance with the applicable depreciation schedule for the time being approved or determined by the Regulator under section 47K(3).

3.2 Marsden Jacob review of Section 47H(1)

3.2.1 Section 47H(1)(a): Depreciated optimised replacement cost

This section reviews 47H(1)(a) which states that:

> *Each railway owner must … prepare and submit to the Regulator a statement of the principles, rules and practices (the costing principles) that are to be applied and followed by the railway owner –*
> *(a) when determining the depreciated optimised replacement cost of applicable railway infrastructure under section 47J(1)(a)*
> *…*

Relevant sections of the Costing Principles assessed in this section:

- Section 2.1 Purpose
- Section 2.3 Replacement Cost

- Section 2.5 Optimisation
- Section 2.6 Construction approach

DORC calculation method (Section 2.1)

Arc Infrastructure Proposal

Section 2.1 of the Costing Principles contains the steps to determine the DORC or the initial RAB. In particular, the steps are described as:

'the Railway Owner will:

- *firstly, determine the replacement cost of the modern equivalent asset;*
- *secondly, remove any Contributed Capital from the modern equivalent asset;*
- *thirdly, optimise the modern equivalent asset so it has the capacity to meet the actual and reasonably projected demand; and*
- *finally, depreciate the optimised replacement cost of the asset to reflect accumulated depreciation.'*

Stakeholder Comments

Aurizon indicates that the removal of contributed capital should occur after the DORC has been calculated. In other words, moved from the second to the last step in the Costing Principles proposed by Arc Infrastructure. In particular, they state that

The process most typically followed to establish a RAB using a DORC valuation is:

- *First, to determine the current cost of replacing the assets using modern equivalent assets (replacement cost or RC);*
- *Second, to optimise the modern equivalent assets so that the network is appropriately specified to meet the actual and reasonably projected demand (optimised replacement cost or ORC);*
- *Third, to depreciate the assets to reflect their remaining service potential given their actual age and condition (depreciated optimised replacement cost or DORC); and*
- *Finally, to make any adjustments required prior to establishing the RAB such as the removal of contributed assets.*

Marsden Jacob assessment

The Costing Principles in Section 2.1 describe that replacement costs are first determined for assets and then these assets are optimised. In practice, this process is not necessarily a linear one in that the replacement costs may depend on the optimisation process. For example, optimisation may result in rail that is suitable for higher axle loads than is currently the case, which in turn impacts the replacement cost.

As a result, it would be beneficial to amend the third dot point in Section 2.1 to state that the replacement cost will be adjusted when optimising the modern equivalent asset. This change would be more consistent with the way that DORC is described elsewhere[1].

Additionally, when this change is made, the Contributed Capital deduction should occur after the optimised replacement cost has been developed. This ensures that the deduction of Contributed Capital in the DORC calculation has the same result as removing the funded asset (or original proportion funded) from the DORC. This is discussed later in our report.

Marsden Jacob do not see that it makes a difference whether the Contributed Capital adjustment is made before or after the assets are depreciated in moving from, using Aurizon's terminology, the optimised replacement cost to the depreciated optimised replacement cost.

Costs included in DORC (Section 2.1 and 2.3 of the Costing Principles)

Arc Infrastructure Proposal

In Section 2.1, the Costing Principles state that the DORC will be developed for applicable Railway Infrastructure for each Route Section of the Railway Network. This indicates that the costs will incorporate all of the facilities in Table 1 under the Railway Infrastructure definition, which describes the meaning of Railway Infrastructure. Additionally, Section 2.3 of the Costing Principles states that the asset replacement cost will include provisions for:

- *'design development, planning and approval costs;*
- *material costs;*
- *construction costs;*
- *project and construction management costs; and*
- *funding (opportunity) costs'.*

Stakeholder comments

CBH states that 'In accordance with Clause 2 of Schedule 4 of the Code, cuttings and embankments made prior to the commencement of the Code are excluded from the definition of Railway Infrastructure and will be excluded from the RAB'. Aurizon also suggest that the Costing Principles should make it clear that cuttings and embankments made prior to commencement of the Code are to be excluded from Railway Infrastructure included in the DORC valuation.

Aurizon indicates that the Costing Principles '*do not specifically discuss the assets to be included in the valuation, except to state that the valuation will include applicable Railway Infrastructure for each Route Section*.' They also indicate that this should refer to the definition of Railway Infrastructure in the Code.

[1] Marsden Jacob (2013), Review of Australian Rail Track Corporation's valuation for the Gap to Turrawan Section of the Hunter Valley rail network, Report prepared for the Australian Competition and Consumer Commission, https://www.accc.gov.au/by-industry/rail-shipping-and-ports/hunter-valley-rail-network-access-undertaking/gap-to-turrawan-variation-2014/position-paper, page 11

Marsden Jacob assessment

With regard to the type of asset, the Costing Principles should also explicitly mention that:

- Consistent with the Code (Schedule 4 Clause 2(5)), costs incurred in acquiring interest in land are not included in the initial RAB calculations (as per Section 47J of the Code) unless the ERA determines that they relate to the acquisition of interest in land after the Commencement of the Code.
- Consistent with ERA's determination in the 2020 Costing Principles, cuttings and embankments should not be included in the initial RAB calculations (as per Section 47J of the Code), although expenditure since the commencement of the Rail Access Regime to create capacity or expand the network, or improve standards or efficiency, are to be included (2020 Costing Principles Section 2.2).

Additionally, to improve clarity of what assets are included in the DORC valuation, Section 2.3 should also indicate the asset types to be included in the DORC valuation with reference to Railway Infrastructure and its definition in Section 1.4 of the Costing Principles.

Lowest cost (Section 2.3 of the Costing Principles)

Arc Infrastructure Proposal

In section 2.3, the Costing Principles indicate that costs for the DORC valuation will be based on those typical for efficient entities developing an asset of this scale, considering variations in cost relating to distance, geography and local factors at each Route Section.

Stakeholder comments

CBH recommend that the Costing Principles include an explanation of '*the evidence Arc will provide to the ERA and access seekers to demonstrate how its estimate of asset replacement costs reflect 'the lowest current cost to replace the railway infrastructure' as required by the Code*'.

Similarly, Pacific National has indicated that the use of 'efficient entities' as a benchmark should be defined and updated to include examples of the 'efficient entities' that will be considered. Pacific National also indicates that '*only development and construction costs that are prudent and based on economic merit are to be included*'.

Marsden Jacob assessment

The Costing Principles in Section 2.3 should be amended to provide greater direction on what is meant by 'lowest current cost' for optimised Modern Equivalent Assets as per the Code and how this will be achieved.

The definition of DORC in Section 3 of the Code states:

> *Depreciated optimised replacement cost, in relation to railway infrastructure, means —*
>
> *(a) the lowest current cost to replace the railway infrastructure with assets that —*
>
> *(i) have the capacity to provide the level of service that meets the actual and reasonably projected demand; and*
>
> *(ii) are modern equivalent assets;*

While Section 2.3 refers to the costs for 'efficient entities', the Costing Principles in this section should be consistent with the Code (see above) and refer to the optimised replacement cost being 'lowest current cost'. Additionally, the Costing Principles should provide more information on how Arc Infrastructure will achieve 'lowest cost'. For example, the previous 2020 Costing Principles provides more specific information on lowest cost with reference to 'confirm unit rates are based on efficient costs' and 'All costs will be calculated using best practice capital cost unit rates'.

Level of service and reasonably project demand (Section 2.5)

Arc Infrastructure Proposal

Level of service is referred to in Section 2.5 of the Costing Principle. In particular, this section states that:

> *the asset replacement cost will be based on an optimised asset configuration where the existing asset configuration is adjusted as required to deliver the level of service.*

Stakeholder comments

CBH recommends that the Costing Principles explain how the level of service will be determined that is assumed for optimisation, as well as the methodology that Arc will apply to estimate reasonably projected demand.

Aurizon states that the Costing Principles should include '*additional detail around the considerations in determining actual and future demand, and the level of service required to meet that demand*'.

Pacific National recommends that more detail should be supplied in the Costing Principles on what 'reasonably projected demand' is and how it will be calculated.

Comparable rail framework approaches

Marsden Jacob notes that, under Section 13.1 of the HVAU, ARTC publishes quarterly Network Key Performance Indicators relating to service quality areas.[2] This includes information for each of three zones to and from the Newcastle port relating to average track speed, paths unavailable, maximum axle loads, maximum speeds and train length.

Marsden Jacob assessment

The Costing Principles would benefit from greater clarity around how level of service is defined and will be considered in ensuring that railway infrastructure has the capacity to meet actual and reasonably projected demand. The Code provides some guidance on this in its definition of infrastructure capacity (Section 3 of the Code):

> *infrastructure capacity, in relation to a route, means the total number of rail operations that can be accommodated on the route during a particular time having regard to —*
>
> *(a) the characteristics of the route; and*

—

[2] https://www.artc.com.au/customers/access/access-hunter-valley/performance-indicators/

(b) the length of the rolling stock comprising a train that can be operated on the route, and the speed at which it can be operated; and

(c) the requirements of any written law; and

(d) the technical requirements for the relevant rolling stock;

This illustrates that the Code defines infrastructure capacity (Section 3) with reference to some key aspects of level of service, such as: 'total number of rail operations that can be accommodated on the route during a particular time'; 'the length of the rolling stock comprising a train that can be operated on the route'; 'the speed at which it can be operated'; and 'technical requirements for the relevant rolling stock'.

Optimisation (section 2.5 of the Costing Principles)

Arc Infrastructure Proposal

With respect to optimisation, Section 2.5 of the Costing Principles states that '*the optimised asset configuration will be that which has the capacity to meet the actual and reasonably projected demand, within the physical constraints of the existing rail corridor, that can be constructed at least cost*'.

Stakeholder comments

CBH recommends that more information be provided to describe how the asset configuration will be '*optimised to deliver the level of service required to meet reasonably projected demand*' with the Costing Principles '*explicitly stating that redundant assets will be removed and that design optimisation opportunities will be considered*'.

Pacific National recommends that more detail on the optimisation approach should be supplied in the Costing Principles. Pacific National provide an example of an optimisation process that considers: identifying and verifying redundance assets; assessing MEA capability against existing capability to identify any technical superiority; and assessing demand forecasts to verify any required changes in service capability of assets.

Aurizon states that the Costing Principles should provide more specific guidance around the matters that will and won't be considered as part of the optimisation step. They mention that regulators have typically: accepted the alignment and gauge of the existing rail network; and optimised the asset base to remove redundant and over-capacity assets. Aurizon also states that the Costing Principles should include additional detail around the considerations in determining actual and future demand, and the level of service required to meet that demand.

Marsden Jacob assessment

The Costing Principles in Section 2.5 should provide more information on the optimisation approach that will be adopted by Arc Infrastructure. This should include explanation that outlines:

- Redundant assets will be identified and removed from the DORC valuation
- The MEA will be an optimised asset that aligns with the level of service that is considered appropriate

for the reasonably projected demand. For example, this could include considering the optimised level for the maximum axle load standard.

- Demand forecasts will be used to project reasonably project demand, and
- Assets will be optimised for each Route Section.

The Costing Principles should also describe constraints that will be considered in optimisation and the reasons for deciding on these constraints. For example, one such constraint mentioned in the submissions that could be considered is assuming existing rail gauges (narrow and standard).

Construction approach (section 2.6 of the Costing Principles)

Arc Infrastructure Proposal

In Section 2.5, the Costing Principles indicate that the asset replacement cost will be developed from an undeveloped greenfield site, but taking into consideration where proximate non-Railway Network infrastructure exists as at the Valuation Date.

In its explanatory document (Section 2.6), Arc Infrastructure provides further information on its approach, including:

- Construction will have regard to the current surrounding land use and development.
- *'the "proximate non-Railway Network infrastructure" refers to the actual features surrounding the Railway Infrastructure which must be considered in the asset replacement cost. For example, this may include considerations such as above ground power lines, underground water pipes, application of environmental legislation or the existence of residential buildings adjacent to the Railway Network.'*
- '*The construction approach applied will assume a realistic duration, expected to be a single stage project with appropriate sub-projects to reflect realistic market capability*'.

Stakeholder comments

CBH states that the Costing Principles appear to create a '*hybrid' greenfield / brownfields approach, indicating that a hybrid approach 'could allow flexibility to 'cherry-pick' assumptions to inflate replacement costs in different locations*'. CBH further submits that '*a brownfields approach with a clear definition should be adopted as it is more closely reflects the environment that a replacement asset would be constructed in. It is also consistent with what has been commonly adopted in other jurisdictions*'.

Aurizon also recommends that the construction approach adopted should reflect a brownfields approach. Aurizon states that this would reflect that *'while the infrastructure is assumed to be developed from a virgin site, it should have regard to the current surrounding land use and development*' and that construction is undertaken in a single stage. Aurizon further states that the Costing Principles are consistent with this point.

CBH recommends that the brownfields approach would mean that the following infrastructure is excluded:

- Access roads (that are not part of the rail corridor)
- Power infrastructure
- Fibre optics
- Water networks
- Land acquisition
- Cuttings and embankments made before commencement of the Code.

Marsden Jacob assessment

The Costing Principles in Section 2.6 should be amended to incorporate additional clarity around the construction approach.

The Costing Principles state that:

> *The asset replacement cost will represent the cost of developing and constructing an asset of this scale, starting from an undeveloped greenfield site, but taking into consideration where proximate non-Railway Network infrastructure exists as at the Valuation Date*.

An example of a relevant construction approach is the regulatory approach taken for the DORC valuation of the ARTC track from Gap to Turrawan in the Hunter Valley adopted a brownfields approach (MJA, 2013, p.13)[3]. In that review, Marsden Jacob provided the following definitions (MJA, 2013, p.14)[4]:

- Greenfields valuation: Under a greenfields valuation, a new rail section is developed assuming that no development has occurred in the area including roads, water, electricity or communities. Therefore, a theoretical track could be laid across an area of land that is free of any development.
- Brownfields valuation: Under a brownfields valuation, a new rail section is developed assuming that construction occurs around existing infrastructure, including those relating to above rail development, roads and communities. Therefore, a brownfields valuation optimises the route of the section taking into account existing developments. Moreover, a brownfields valuation is limited in its ability to optimise the route path in the way that a greenfields valuation is able to do so.

In the context of the Costing Principles, the proposed approach appears to be a greenfields approach with some allowance for a brownfields approach as it takes into account proximate infrastructure.

Direct discussions with Arc Infrastructure indicated that the construction approach assumes that the rail track follows existing routes and allows for proximate infrastructure. This indicates a brownfields consideration to the valuation.

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[3] Marsden Jacob (2013), Review of Australian Rail Track Corporation's valuation for the Gap to Turrawan Section of the Hunter Valley rail network, Report prepared for the Australian Competition and Consumer Commission, https://www.accc.gov.au/by-industry/rail-shipping-and-ports/hunter-valley-rail-network-access-undertaking/gap-to-turrawan-variation-2014/position-paper

[4] Marsden Jacob (2013), Review of Australian Rail Track Corporation's valuation for the Gap to Turrawan Section of the Hunter Valley rail network, Report prepared for the Australian Competition and Consumer Commission, https://www.accc.gov.au/by-industry/rail-shipping-and-ports/hunter-valley-rail-network-access-undertaking/gap-to-turrawan-variation-2014/position-paper

Marsden Jacob recommends that the construction approach is based on a brownfields valuation with some caveats. The reason for this is that most DORC valuations in rail have been based on brownfield approaches (e.g. as discussed in GHD (2021)[5] and as undertaken in MJA (2013)[6]). The key feature of brownfields approaches is that the rail infrastructure is valued at the same location and route as the existing assets and assuming current supporting infrastructure (e.g. access roads, electricity etc.). This approach is indicated by the Costing Principles, with reference to proximate non-Railway Network infrastructure in Section 2.6, but should be made clearer within the Costing Principles.

However, this approach should be complemented by some caveats which state that:

- cuttings and embankments are not included in the initial DORC value, although expenditure since the commencement of the Rail Access Regime to create capacity or expand the network, or improve standards or efficiency, are included. This is discussed earlier in this report.
- The new railway infrastructure is constructed without any existing traffic on the rail. This was assumed in the Gap to Turrawan DORC valuation (MJA, 2013)[7] and is consistent with the cost that a new entrant would face if they constructed a new rail line.
- Planning and development costs should be included the extent to which they are required to integrate with existing infrastructure (e.g. metropolitan areas). This is consistent with MJA (2013)[8].

Actual operating costs being different to under optimised MEA (not part of the proposed Costing Principles)

Arc Infrastructure Proposal

The Costing Principles do not address this issue.

Stakeholder comments

Aurizon states that '*Arc's actual maintenance cost profiles (including major periodic maintenance and capex) may be higher that would be the case if a MEA standard asset were in place*'. To resolve this issue, Aurizon suggests that it is '*necessary to adjust the asset value to reflect differences between Arc's operating and maintenance cost profiles given the existing asset condition, and those that would be expected from the assumed MEA standard asset. The approach that is usually taken is to calculate the NPV of operating expenditure savings that would be anticipated due to:*

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[5] GHD Advisory (2021), Developing a Regulatory Asset Base value for the Australian Rail Track Corporation Interstate Network, using the Depreciated Optimised Replacement Cost method Concluding Public Report, The Australian Competition and Consumer Commission, 07 October 2021, page

[6] Marsden Jacob (2013), Review of Australian Rail Track Corporation's valuation for the Gap to Turrawan Section of the Hunter Valley rail network, Report prepared for the Australian Competition and Consumer Commission, page 15, https://www.accc.gov.au/by-industry/rail-shipping-and-ports/hunter-valley-rail-network-access-undertaking/gap-to-turrawan-variation-2014/position-paper

[7] Marsden Jacob (2013), Review of Australian Rail Track Corporation's valuation for the Gap to Turrawan Section of the Hunter Valley rail network, Report prepared for the Australian Competition and Consumer Commission, page 15, https://www.accc.gov.au/by-industry/rail-shipping-and-ports/hunter-valley-rail-network-access-undertaking/gap-to-turrawan-variation-2014/position-paper

[8] Marsden Jacob (2013), Review of Australian Rail Track Corporation's valuation for the Gap to Turrawan Section of the Hunter Valley rail network, Report prepared for the Australian Competition and Consumer Commission, page 15, https://www.accc.gov.au/by-industry/rail-shipping-and-ports/hunter-valley-rail-network-access-undertaking/gap-to-turrawan-variation-2014/position-paper

- *The assumption of MEA standard assets, where higher costs are expected to be incurred given the nature of the actual existing assets; and*
- *Optimisation, where assets are excluded from the optimised network configuration for valuation purposes, but where the actual configuration of assets means that costs will continue to be incurred in maintaining those assets*.'

Marsden Jacob assessment

The Costing Principles should be amended so that the present value of maintenance and operating cost savings associated with optimised modern equivalent assets is calculated in the DORC valuation up-front that forms the initial RAB.

This change to the Costing Principles is necessary because the operating costs assumed under an optimised MEA will be different to the operating costs using the existing assets. This results in an inconsistency between the assets that form part of the optimised MEA and future operating costs if they are based on actual costs.

Marden Jacob's recommended solution to this is to adopt the approach taken by the ACCC (2014)[9] which is to adjust the initial RAB by the present value of cost savings associated with a new and modern asset and to allow future operating costs to reflect actual costs. This is consistent with the approach recommended by Aurizon in its submission.

However, it is unclear to Marsden Jacob whether this amendment to the Costing Principles is consistent with the Code, as this type of adjustment to the RAB is not specifically mentioned in the Code. If it is not considered to be consistent by the ERA, an alternative would be to adjust operating expenditures over time for the difference in actual operating cost and those that would result from using the optimised modern equivalent assets.

[9] ACCC (2014), Australian Rail Track Corporation's variation of the Hunter Valley Access Undertaking to include the Gap to Turrawan Sections, https://www.accc.gov.au/system/files/25062014%20%20ARTC%20HVAU%20-%20Gap%20to%20Turrawan%20variation%20-%20Final%20Decision.pdf?ref=0&download=y, page 12.

Recommendation 1:

(1) In Section 2.1, the Costing Principles should be amended under the third dot point to indicate that the replacement cost will be adjusted when optimising the modern equivalent asset. Additionally, the second dot point (which refers to Contributed Capital) should be placed after third dot point (which refers to the asset being optimised).

(2) In Section 2.3, the Costing Principles should explicitly mention that:

   a. the costs incurred in acquiring interest in land are not included in the initial RAB calculations (as per Section 47J of the Code) unless the ERA determines that they relate to the acquisition of interest in land after the Commencement of the Code.

   b. cuttings and embankments are not included in the initial RAB calculations, although expenditure since the commencement of the Rail Access Regime to create capacity or expand the network, or improve standards or efficiency, are included.

(3) Additionally, to improve clarity of what assets are included in the DORC valuation, Section 2.3 should also indicate the asset types to be included in the DORC valuation with reference to Railway Infrastructure and its definition in Section 1.4 of the Costing Principles.

(4) In Section 2.3, the Costing Principles should specifically refer to the optimised replacement cost being 'lowest current cost' with an explanation of how this will be achieved.

(5) In Section 2.1 or 2.5, the Costing Principles should describe how level of service will be defined, as well as explaining how level of service will be considered in ensuring that railway infrastructure has the capacity to meet actual and reasonably projected demand. In particular, the Costing Principles should reference some key aspects of level of service, such as: 'total number of rail operations that can be accommodated on the route during a particular time'; 'the length of the rolling stock comprising a train that can be operated on the route'; 'the speed at which it can be operated'; and 'technical requirements for the relevant rolling stock'.

(6) In Section 2.5, the Costing Principles should provide clarity on the method by which reasonably projected demand will be estimated.

(7) In Section 2.5, the Costing Principles should provide more information on the optimisation approach that will be adopted by Arc Infrastructure. This should include explaining that:

   a. Redundant assets will be identified and removed from the DORC valuation

   b. The MEA will be an optimised asset that aligns with the level of service that is considered appropriate for the reasonably projected demand. For example, this could include considering the optimised level for the maximum axle load standard.

   c. Demand forecasts will be used to project reasonably project demand, and

   d. Assets will be optimised for each Route Section.

   Marsden Jacob notes that these points have been addressed in the explanatory document prepared by Arc Infrastructure (Section 2.5).

   The Costing Principles should also describe constraints that will be considered in optimisation and the reason for deciding on these constraints. For example, one such constraint mentioned in the submissions is assuming existing rail gauges (narrow and standard).

(8) In Section 2.6, the Costing Principles should be amended to state that the construction approach is based on a brownfields approach with some caveats:

   a. cuttings and embankments are not included in estimating the initial DORC value, although

expenditure since the commencement of the Rail Access Regime to create capacity or expand the network, or improve standards or efficiency, are included.

b. the new infrastructure is constructed without any existing traffic on the rail.

c. planning and development costs should be included to the extent to which they are required to integrate with existing infrastructure (e.g. metropolitan areas).

(9) The Costing Principles should be amended so that the value of maintenance and operating cost savings associated with optimised modern equivalent assets is calculated in the DORC valuation that forms the initial RAB. Marsden Jacob notes that this recommendation has been addressed in the explanatory document prepared by Arc Infrastructure (Section 2.5).

3.2.2 Section 47H(1)(b): Updated regulatory asset base

This section reviews 47H(1)(b) which states that:

> *Each railway owner must … prepare and submit to the Regulator a statement of the principles, rules and practices (the costing principles) that are to be applied and followed by the railway owner –*
> *…*
> *(b) when determining the updated regulatory asset base of applicable railway infrastructure under section 47N(1)*

Relevant sections of the Costing Principles assessed in this section:

- Section 3.1 Purpose
- Section 3.2 Asset Indexation
- Section 3.3 Capital Expenditure
- Section 3.6 Disposed, Redundant and Stranded Railway Infrastructure

Defining and updating the RAB (Sections 3.1 of the Costing Principles)

Arc Infrastructure Proposal

In Section 3.1, the Costing Principles provides the approach for calculating the updated RAB for each Route Section. In particular:

- *take the current RAB of the Route Section;*
- *add asset indexation for the Relevant Period;*
- *add the value of Capital Expenditure incurred by the Railway Owner during the Relevant Period;*
- *deduct depreciation over the Relevant Period; and*
- *deduct the value of Railway Infrastructure which was disposed of or became redundant or stranded during the Relevant Period.*

Stakeholder Comments

Aurizon states that '*the process set out in the proposed Costing Principles for an annual roll-forward of the RAB is generally in accordance with typical regulatory processes*'.

Marsden Jacob assessment

The general RAB calculation and updating method contained in the Costing Principles in Section 3.1 is consistent with the Code (the RAB definition in Section 47J and updating the RAB as defined in Section 47N(1)). Additionally, the general RAB calculation and updating method contained in the Costing Principles is consistent with accepted regulatory practice – in particular, Section 3.1 of the Costing Principles which describes the RAB calculation components. Other sectors, such as water and energy, use a similar process to update the RAB through their roll-forward processes.

Asset indexation (Section 3.2 of the Costing Principles)

In Section 3.2 of the Costing Principles, the Costing Principles indicate that asset indexation (which occurs as part of a RAB update) will occur using the Perth consumer price index and that the asset Indexation value shall not be less than zero.

Stakeholder comments

CBH and Pacific National indicated in their submissions that asset indexation should be able to be less than zero. CBH further recommended that the consumer price index (CPI) that is used for indexation should be the Australia Consumer Price Index (all Groups, weighted average eight capital cities) as it represents what '*the notional investor will consider inflation across Australia'* and is *'consistent with what is applied by the ERA when determining Arc's WACC and the approach taken in other regulatory schemes such as electricity*'.

CBH also has concerns about how the indexation approach applies to the timing of the first RAB update:

> *'The proposed indexation approach should not apply to the first RAB update. This is because the first RAB update covers the 6-month period from the valuation date of 31 December 2024 to 30 June 2025. In contrast, the proposed asset indexation formula rolls forward the RAB based on one year of indexation. As such, the proposed approach would overcompensate Arc for inflation in the first RAB update'*

Comparable rail framework approaches

Different approaches are taken to index the RAB across other rail systems. The Hunter Valley coal network undertaking uses an indexation formula based on changes in the CPI, although zero indexation occurs when CPI is less than zero or when considering historical maximum values of the consumer price index[10]. In contrast, the Aurizon and Queensland Rail undertakings are indexed by CPI, with no floor level on the indexation adjustment.

[10] According to ARTC (2020) Hunter Valley Coal Network Access Undertaking Version 8 Explanatory Guide, the undertaking contains a CPI mechanism that prevents negative inflation from deflating the RAB Floor Limit in the roll forward calculations for 2022 onwards as agreed with customers. Additionally, in the event of negative CPI, the RAB is not be escalated in future roll forwards until the value of the indexation factor exceeds that of the previous maximum value.

Marsden Jacob assessment

The following statement in Section 3.2 should be removed: 'Asset Indexation value shall not be less than zero'. This does not appear to be consistent or allowed for under the Code.

Additionally, the use of the Perth All Groups Consumer Price Index (CPI) in section 3.2 of the Costing Principles is inconsistent with the 2020 Costing Principles which use the Weighted Average of Eight Capital Cities All Groups CPI. Furthermore, Marsden Jacob understands that all other regulatory instruments in other ERA jurisdictions (gas and electricity) rely on the Eight Capital Cities measure.

Considering CBH's point about indexation at the first RAB point, the Costing Principles should be amended in Section 3.2 and state that indexation for the first RAB update should be 0.5 x indexation using CPI if is it only 6 months after the initial RAB has been set or the appropriate proportion to reflect the part-year nature of the RAB update.

Capital expenditure and land (section 3.3 of the Costing Principles)

Arc Infrastructure Proposal

In Section 3.3, the Costing Principles do not describe how new land expenditures will be treated in determining the value of capital expenditure to be added to the RAB.

Stakeholder comments

Aurizon indicates that the Costing Principle should address how land is to be incorporated in accordance with Schedule 4 of the Code which refers to the amortisation of costs incurred in relation to the acquisition of land used for constructing, maintaining or operating a relevant railway, where these costs have been incurred after commencement of the Code.

Marsden Jacob assessment

Section 3.3 (Capital expenditure) of the Costing Principles should include reference to how costs incurred to acquire land after the commencement of the Code are to be amortised. This ensures that the Costing Principles are consistent with the Code, as per Schedule 4 clause 2(5)(a)-(b) of the Code) which states that costs incurred by the railway owner or an associate of the railway owner to acquire any interest in land are to be amortised when included as part of capital costs.

Efficient capital expenditure (section 3.3 of the Costing Principles)

Arc Infrastructure Proposal

In Section 3.2, the Costing Principles do not refer to a prudent railway owner acting efficiently.

Stakeholder comments

CBH recommends that the definition of Capital Expenditure is changed from '"*Means the capital expenditure incurred by the Railway Owner or an Associate of the Railway Owner in relation to the Railway Network…" to "Means the prudent and efficient capital expenditure incurred by the Railway Owner or an Associate of the Railway Owner in relation to the Railway Network…*"'.

Pacific National recommends that the Costing Principles should state that capital expenditure must be confirmed as prudent before it can be added to the RAB.

Marsden Jacob assessment

Section 3.3 of the Costing Principles should be amended to state that capital expenditure will be efficient and prudent. This is consistent with Section 47N(3) of the Code, which indicates that capital expenditure should be efficient and is what '*would have been incurred by a prudent railway owner acting efficiently in accordance with good industry practice to achieve the lowest sustainable cost of providing access holders*'.

Addition of half-WACC to capex (section 3.3 of the Costing Principles)

Arc Infrastructure Proposal

In Section 3.3, the Costing Principles state that Investments will be assumed to occur, on average, mid-year, so a half WACC will be added to the Capital Expenditure to compensate for the six-month period before Capital Expenditure is included in the RAB.

Stakeholder comments

CBH suggests that the Costing Principles should include the formula that Arc will use to calculate the half-year WACC in Section 3.3. They suggest that the half year WACC formula should be:

$$half\ year\ WACC = (1+WACC)^{1/2}-1$$

Marsden Jacob assessment

Further clarification is needed to explain what is meant by half the WACC being added to the capital expenditure. Marsden Jacob recommends that a formula is needed to explain the application of this sentence. For example, this could be described as:

> Capital expenditure that is added to the RAB at the end of the relevant year is equal to capital expenditure multiplied by $(1+WACC)^{(1/2)}$.

This approach is consistent with the post-tax revenue models published by the Australian Energy Regulator[11].

Disposed, Redundant and Stranded Railway Infrastructure (Sections 3.6 of the Costing Principles)

Arc Infrastructure Proposal

In Section 3.6, the Costing Principles describes the rules for considering whether Railway Infrastructure is disposed of or becomes redundant or stranded. In particular, Section 3.6 states that:

> *Railway Infrastructure will be considered to be:*
>
> - *disposed of, where that Railway Infrastructure has been decommissioned and removed from the Railway Network;*
> - *redundant, where that Railway Infrastructure is no longer in use and is no longer required to be used due to replacement with other Railway Infrastructure, changes in standards, advancements in technology, or similar; or*

[11] https://www.aer.gov.au/documents/appendix-amended-electricity-distribution-ptrm-april-2021

- *stranded, where that Railway Infrastructure has been fully depreciated as per section 3.5 of these Costing Principles and taken out of service due to lack of foreseeable demand.*

Stakeholder comments

In its submission, Aurizon recommends that the reference to stranded railway infrastructure in Section 3.6 should not include reference to where the assets have been fully depreciated, since a circumstance where there is no foreseeable demand for the assets could occur regardless of the situation where the assets are not fully depreciated.

Marsden Jacob assessment

In Section 3.6, the definition of stranded assets should exclude a reference to the asset being fully depreciated under the third dot point since an asset that is not fully depreciated could still not have foreseeable demand. Moreover, this recommendation is made because the Code, under Section 47N(3)(e), does not allow for an asset to remain in the RAB if it is considered stranded even if it has not been fully depreciated.

Recommendation 2:

(1) In Section 3.2 of the Costing Principles:
   a. the following statement in Section 3.2 should be removed: 'Asset Indexation value shall not be less than zero'.
   b. the reference to Perth All Groups Consumer Price Index (CPI) should be replaced with the Weighted Average of Eight Capital Cities All Groups CPI.

(2) In Section 3.2, the Costing Principles should state that indexation for the first RAB update should be equal to 0.5 x indexation using CPI if is it only 6 months after the initial RAB has been set or the appropriate proportion to reflect the part-year nature of the RAB update.

(3) In Section 3.3, the Costing Principles should:
   a. include reference to how costs incurred to acquire land are to be amortised when included as part of capital costs
   b. be amended to state that capital expenditure will be efficient and prudent.

(4) In Section 3.3, the Costing Principles should explain what is meant by half the WACC being added to the capital expenditure. In particular, Marsden Jacob recommends that a formula is needed to explain the application of this approach. See above for an example formula. The same clarification is required in Section 3.6 of the Costing Principles when referring to disposed, redundant or stranded assets.

(5) In Section 3.6, the definition of stranded assets should exclude a reference to the asset being fully depreciated.

3.2.3 Section 47H(1)(c): Costs

This section reviews 47H(1)(c) which states that:

Each railway owner must … prepare and submit to the Regulator a statement of the principles, rules and practices (the costing principles) that are to be applied and followed by the railway owner –

…

(c) when determining the costs referred to in Schedule 4 clauses 7 and 8

Relevant sections of the Costing Principles assessed in this section:

- Section 4.1 Total Costs
- Section 4.2 Operating Costs
- Section 4.3 Capital Costs – Risk Adjusted Return
- Section 4.4. Capital Costs – Depreciation
- Section 4.5 Overhead Costs
- Section 4.6 Incremental Costs
- Appendix 3 Cost allocators -2

General cost method (Section 4.1 of the Costing Principles)

Arc Infrastructure Proposal

In Section 4.1. the Costing Principles state that total Costs are the sum of the Operating Costs, Capital Costs (depreciation and risk adjusted return) and Overhead Costs

Stakeholder Comments

There were no stakeholder comments directly addressing the general approach in Section 4.1. Stakeholders did provide feedback on issues relating to how the components of total costs are to be calculated, which are discussed in other sections of this report.

Marsden Jacob assessment

The method to calculate total costs contained in the Costing Principles in Section 4.1 is consistent with the Code – in particular Schedule 4 clauses 1.

Efficient and forecast costs – operating expenditures (section 4.2 of the Costing Principles)

Arc Infrastructure Proposal

In Section 4.2 (Operating Costs), the Costing Principles do not refer to a prudent railway owner acting efficiently.

However, Section 4.2 does state that in responding to a Proposal from an access seeker, the Operating Costs referred to in section 9(1)(b)(ii) of the Code will comprise the sum of the annual Operating Costs applicable, or forecast to be applicable, in respect of each year of the term of the Proposal.

In its explanatory document (Section 4), Arc Infrastructure provides further information on factors it may consider when forecasting costs, including:

- *'projected life of the assets depending on:*
  - *the current asset condition;*
  - *the expected remaining life of the asset given current and expected use; and*
  - *any planned earlier replacement.*
- *estimated replacement cost of the assets;*
- *number of contracted train paths as a proportion of the total number of contracted train paths operated on the Route Section;*
- *number of GTKs as a proportion of the total GTKs operated on the Route Section;*
- *number of train services as a proportion of the total number of train services operated on the Route Section;*
- *type of rollingstock and product transported;*
- *Network standard required;*
- *future Network requirements; and*
- *factors outlined in section 4.6 of the Costing Principles'*

Stakeholder comments

Both CBH and Pacific National indicate that the Costing Principles should provide more guidance on how operating costs will be determined and how Arc Infrastructure will ensure that operating costs are efficient. CBH states that '*the Costing Principles provides insufficient guidance in relation to how current and forecast operating costs will be determined and evidenced as efficient*'. CBH further suggests that Arc Infrastructure could consider approaches such as a base-step-trend approach to estimate and forecast costs.

Comparable rail framework approaches

Marsden Jacob notes that rail undertakings for other rail networks have a stated focus on efficiency. For example,

- Hunter Valley coal network undertaking:

  ""Efficient" means, in respect to costs and operating expenditure, costs incurred by a prudent service provider managing the Network, acting efficiently, having regard to any matters particular to the environment in which management of the Network occurs including:

  (a) the Hunter Valley Coal Chain where a key objective in maintenance planning is to maximise coal chain throughput and reliability;

  (b) ARTC's obligations to maintain the Network having regard to the terms of applicable Access Agreements and Access Holder Agreements existing at the time; and

(c) ARTC's obligations under the law, applicable legislation (including regulations) or the NSW Lease" [12]

"recovery of at least sufficient Access revenue to meet the efficient costs associated with Access to the Network, having regard to the efficient operation of the Hunter Valley Coal Chain" [13]

"all costs" that form part to the RAB will be *"assessed on an efficient basis"*[14].

- Queensland Rail:

  "Efficient Costs means, for each Year during the Evaluation Period, the costs that would be reasonably expected to be incurred by a Railway Manager adopting efficient work practices to, amongst other things, provide, operate and maintain the Network at the required service standard and meet its obligations under Access Agreements"[15].

  "Extension Costs means the costs that would be reasonably expected to be incurred in undertaking an Extension adopting efficient work practices to construct and commission the Extension to the required service standard and to meet the Railway Manager's obligations under Access Agreements" [16].

- Aurizon: Efficient costs is defined as:

  "The cost for each Year during the Evaluation Period, that reflects the cost that would be reasonably expected to be incurred by a Railway Manager adopting efficient work practices in the provision of the Rail Infrastructure to the required service standard".[17]

Marsden Jacob assessment

Section 4.2 of the Costing Principles should be amended to state that operating expenditures (operating costs and overhead expenditures) will be efficient and prudent, which is consistent with Schedule 4 clause 4 and Section 3 of the Code.

Schedule 4 clause 4 of the Code states that:

> *The costs referred to in this Schedule are intended to be those that would be incurred by a body managing the railways network and adopting efficient practices applicable to the provision of railway infrastructure, including the practice of operating a particular route in combination with other routes for the achievement of efficiencies.*

Additionally, Section 3 of the Code defines efficient costs as:

> *efficient costs means the costs that would be incurred by a prudent railway owner acting efficiently in accordance with good industry practice to achieve the lowest sustainable cost of providing access.*

—

[12] ARTC, 2021, Hunter Valley Coal Network Access Undertaking, Version 8, Section 14
[13] ARTC, 2021, Hunter Valley Coal Network Access Undertaking, Version 8, Section 4.5
[14] ARTC, 2021, Hunter Valley Coal Network Access Undertaking, Version 8, Section 4.5
[15] Queensland Rail, 2020, Queensland Rail's Access Undertaking 2, 1 July 2020, Part 7
[16] Queensland Rail, 2020, Queensland Rail's Access Undertaking 2, 1 July 2020, Part 7
[17] Aurizon, 2019, Aurizon Network 2017 Access Undertaking (UT5), Part 12

Furthermore, the Costing Principles should provide more information about how Arc Infrastructure will ensure that operating expenditures are efficient. For example, some methods to ensure efficiency could include (not exhaustive): benchmarking of costs; competitive tendering; ensuring the scale and scope of expenditure matches demand; demand forecasting analysis; business cases for larger expenditure; and analysing trends in costs over time.

The Costing Principles should also have more information specifically on the efficiency of maintenance costs. This was discussed in detail in the 2020 Costing Principles. For example, this could include detailing (not exhaustive): the inspection and corrective action procedures that underpins routine maintenance; the drivers of the timing of cyclical maintenance for different types of assets; and the maintenance models that will be used to ensure efficient timing of expenditures.

The Costing Principles should also provide more information on how Arc Infrastructure intend to develop efficient forecasts of operating costs over the relevant pricing period. For example, the Costing Principles could consider a base-step-trend approach, which is the preferred approach by the Australian Energy Regulator[18] in calculating operating expenditures. Under this approach, an efficient cost base is adjusted for step-changes and trends in key variables such as outputs, unit rates and productivity levels. Marsden Jacob notes that Arc Infrastructure has provided information in its explanatory document (Section 4) on how it will develop forecast costs over the term of a proposal.

Operating costs – maintenance costs (Section 4.2 of the Costing Principles)

Arc Infrastructure Proposal

The Costing Principles does not provide information on what costs are included as part of maintenance cost and under what circumstances costs will be defined as maintenance vs capital expenditures.

Stakeholder Comments

CBH notes that Part 1 of the Code defines operating costs as:

> *'in relation to railway infrastructure —*
>
> *(a) includes —*
>
> *(i) train control costs, signalling and communications costs, train scheduling costs, emergency management costs, and the cost of information reporting; and*
>
> *(ii) the cost of maintenance of railway infrastructure calculated on the basis of cyclical maintenance costs being evenly spread over the maintenance cycle; and*
>
> *(iii) payments made in respect of any lease or licence that the railway owner or an associate of the railway owner holds over any land, but only to the extent that the Regulator determines that those payments relate to land used for constructing, maintaining or operating the relevant railway and are not capital costs under Schedule 4 clause 2(5); but*

—

[18] Australian Energy Regulator (2014), Overview of the Better Regulation reform package, April 2014

(b) does not include costs that the Regulator has determined under section 47W(3) to be inefficient;'

Marsden Jacob assessment

More information should be included in Section 4 of the Costing Principles on the types of maintenance costs that are included and those that are not. The 2020 Costing Principles provides some guidance on this. For example, the Costing Principles should make it clear whether the following costs are included (not exhaustive):

- Routine maintenance
- Cyclical maintenance
- Cost of repairing incidences for fire and flood, or derailment damage
- Annual working capital charge.

As part of this, the Costing Principles should be amended to make it clear under what circumstances that maintenance expenditures could be classified as capital expenditure for the RAB and not operating expenditure. This will make it clearer how it will be classifying expenditures for inclusion within the updated RAB.

Additionally, Arc Infrastructure should make it clear whether it intends to base its costs on actual costs over the relevant pricing period or apply an annualised value of a future maintenance cost over the life of an asset (as indicated in Section 3.3 of the 2020 Costing Principles).

Operating costs – overhead (Section 1.4, 4.2 and 4.5 of the Costing Principles)

Arc Infrastructure Proposal

In Section 1.4 of the Costing Principles, overhead costs are defined as:

> *'Means all other costs attributable to the performance of access related functions incurred by the Railway Owner (or its Associate) in connection with the Railway Network and includes:*
>
> - *office buildings;*
> - *rent and utilities;*
> - *payroll;*
> - *legal expenses;*
> - *housing;*
> - *freight centres;*
> - *terminal yards;*
> - *depots; and*
> - *other corporate expenditure;*
>
> *but excludes Operating Costs and Capital Costs'*

Stakeholder Comments

CBH expressed concerns about what may be included in "other corporate expenditure" which is categorised as a component of overhead costs in Section 1.4 of the Costing Principles. CBH state that because corporate overhead is not defined, it may allow '*Arc Infrastructure to 'hide' costs that are not aligned with those incurred by an efficient operator, such as distributions to its Parent Company (i.e. management fees), by grouping them into a miscellaneous cost 'bucket*". They further suggest that this may result in inefficient costs being recovered from access seekers.

Marsden Jacob assessment

To ensure appropriate separation of costs that are relevant to the rail access business from those are that are not, similar to the 2020 Costing Principles, Section 4.2 of the 2024 Costing Principles should make it clear whether Arc Infrastructure undertakes any business other than rail access and, if it does, how it intends to allocate overhead between its rail access related functions and other functions and businesses.

Rate of return (Section 4.3 of the Costing Principles)

Arc Infrastructure Proposal

The weighted average cost of capital (WACC) is referred to in the Costing Principles in several places. However, the Costing Principles does not describe how the WACC will be calculated.

Stakeholder Comments

CBH states that the word '*"appropriate" should be deleted before the acronym WACC in section 2.3 of the Costing Principles so that it is clear that the WACC to be applied to the development cost curve is the ERA-determined WACC set at 30 June each year pursuant to clause 3 of Schedule 4 of the Code as defined in section 1.4 of the Costing Principles*'.

Marsden Jacob assessment

Similar to the 2020 Costing Principles (Section 2.5), the Costing Principles should make a statement that the ERA will determine the weighted average cost of capital at 30 June each year. This is consistent with clause 3 in Schedule 4 of the Code.

Capital costs – depreciation (Section 4.4 of the Costing Principles)

Arc Infrastructure Proposal

In Section 4.4, the Costing Principles describes how depreciation costs will be calculated.

Stakeholder Comments

There were no stakeholder comments directly addressing this matter, noting that other depreciation issues are discussed elsewhere in this report.

Marsden Jacob assessment

Section 4.4 of the Costing Principles on Capital Costs (Depreciation) should insert the words 'relevant Railway Infrastructure applicable' into the second paragraph so that it becomes:

For the purposes of responding to a Proposal pursuant to section 9(1)(b)(ii) of the Code, the sum of these annual depreciation amounts on the relevant Railway Infrastructure applicable, or forecast to be applicable, over the term of the Proposal comprises the return of capital component of the Capital Costs within the Total Costs to be provided to the Access Seeker.

This change would make it consistent with the way that Section 4.3 of the Costing Principles is worded.

Incremental cost (Section 4.6 of the Costing Principles)

Arc Infrastructure Proposal

Incremental costs are described in Section 4.6 of the Costing Principles. They do not provide a description of the components of incremental costs as per Schedule 4 clause 1 of the Code.

Stakeholder Comments

There were no stakeholder comments directly addressing this matter.

Marsden Jacob assessment

Section 4.6 (incremental costs) of the Costing Principles should include a definition of incremental costs that is consistent with Schedule 4 clause 1 of the Code. This will make it clear how incremental costs will be calculated, similar to how total costs is described in Section 4.1 of the Costing Principles. Specifically, that incremental costs will comprise (a) the operating costs and (b), where applicable, the capital costs; and the overheads attributable to the performance of the railway owner's access-related functions whether by the railway owner or an associate.

Incremental cost factors (Section 4.6 of the Costing Principles)

Arc Infrastructure Proposal

In Section 4.6, the Costing Principles state that the Railway Owner will generally consider the following factors to determine the Incremental Costs:

- *'the percentage that the incremental allocation of capacity represents against the existing capacity already allocated;*
- *the percentage that the incremental volume represents against the existing volumes on the Route;*
- *the standard and condition of the Railway Infrastructure and the specific requirements of the Access Holder or Access Seeker;*
- *the term of the access sought;*
- *the terms of access contracted to other Access Holders; and*
- *whether the Railway Owner would continue to manage and control the use of the Route if access was not provided to the Access Holder or Access Seeker'.*

Stakeholder Comments

CBH recommends that the Costing Principles provide further guidance on how Arc will allocate shared costs between access seekers, such as how it will determine the proportion of maintenance

and repair costs that are associated with greater wear and tear on a shared line from use by a given access holder. CBH also recommend that the Costing Principles provide additional information on how Arc Infrastructure will address circumstances where not providing access would have resulted in Arc building smaller assets or different assets.

Marsden Jacob assessment

Section 4.6 of the Costing Principles contains six factors that Arc Infrastructure has indicated it will consider when determining the Incremental Cost for an access seeker. While these appear reasonable for the Costing Principles, Marsden Jacob believes that any issues in their application are better addressed during the negotiation process between the access seeker and the Railway Owner as there are likely to be intricacies in their application that require discussions between the two parties. Marsden Jacob also notes that our scope of work is on the method and practices to calculate the economic costs relevant for Schedule 4 and not the application of these costs to rail access prices.

Cost allocators (Appendix 3 of the Costing Principles)

Arc Infrastructure Proposal

In Section 4.2, the Costing Principles indicate that where operating costs cannot be directly attributed to a Route Section, the Railway Owner will assign Operating Costs to Route Sections in accordance with Appendix 3. Additionally, In Section 4.5, the Costing Principles indicate that where Overhead Costs cannot be directly attributed to a Route Section, the Railway Owner will assign Overhead Costs to Route Sections in accordance with Appendix 3.

Stakeholder Comments

There were no stakeholder comments directly addressing this matter.

Marsden Jacob assessment

With reference to Appendix 3 of the Costing Principles, comparing the cost allocators in the 2020 Costing Principles to those in the 2024 Costing Principles reveals that they are very similar (Table 2). The major difference is that the 2024 Principles are now based on a fixed approach for train control and overhead costs, which does not require either an operational study (train control) or agreed approach with ERA (overhead). Lease or licence costs have been added to the 2024 Costing Principles which is an appropriate addition.

On face value, these changes seem reasonable to Marsden Jacob and are not inconsistent with the 2020 Costing Principles which were approved by ERA. The cost allocators in the 2020 Costing Principles are considered a reasonable guide, as the changes to the Code are not of themselves considered to have changed the way that costs should be allocated.

Choosing appropriate allocators for non-maintenance cost is always challenging as there are different ways to allocate costs. As a general comment, GTK appears to be reasonable for maintenance as it is likely to reflect the impact of axle weights and traffic on a route section. For the

same reason, train numbers could be seen as a reasonable approach to allocate train control costs as train control systems may be more intensive on route sections with a high degree of traffic.

With respect to costs unrelated to train movements (such as overhead costs) or 'common costs', economists typically argue that Ramsey or inverse elasticity pricing[19,20] could be considered an efficient approach to allocate these type of costs. However, in practice, these costs are typically allocated using simple proportionate approaches as they are simple and easy to apply. Given the lack of a common transparent approach across rail infrastructure within Australia to allocating common costs, Marsden Jacob is not able to provide a definitive assessment of whether the proposed approaches diverge from a common or fair approach to allocating costs for non-maintenance operating costs.

Table 2: Cost allocator comparison

Cost classification	Component	2020 Costing Principles	2024 Costing Principles
Operating costs	Network management – train control costs / centralised train control	Direct allocation to routes based on operational study	By Arc network control area and then train numbers within that network control area
	Network management – access management; train scheduling and operations planning; RAMS management; safeworking management; telephone charges and radio licences (2024 Costing Principles) Signalling and communications costs, train scheduling costs, emergency management costs, and the cost of information reporting (2020 Costing Principles)	Train numbers	Train numbers
	Infrastructure maintenance	By region and then GTKs within that region	By Arc regional maintenance area and then GTKs within that regional maintenance area
	Lease or licence costs	Not stated in the 2020 Costing Principles	GTKs
Overhead costs		GTKs and Train number proportion agreed by the ERA during	GTKs

[19] Baumol, W. J., & Bradford, D. F. (1970, June). Optimal Departures from Marginal Cost Pricing. *American Economic Review*, 265-283.

[20] BTRE (2006), Submission to the Productivity Commission road and rail freight infrastructure pricing inquiry, August 2006, page 9

Cost classification	Component	2020 Costing Principles	2024 Costing Principles
		Incremental and Total cost determinations	

Comparable rail framework approaches

The approach proposed by Arc Infrastructure with respect to cost allocation of maintenance costs is similar to that in the Hunter Valley coal network undertaking. In particular, in the Hunter Valley undertaking, maintenance costs are allocated by gross tonne kilometres (GTK)[21]. This is consistent with Appendix 3 of the Costing Principles.

However, operating costs not associated with maintenance appear to use a mix of methods to allocate costs to the Hunter Valley corridor, between coal and non-coal traffic and then between route sections. Some examples include track kilometres, GTK and train kilometres[22]. Notably, the method to allocate costs to route sections for the coal network is train kilometres. In contrast, the Costing Principles uses a mix of train numbers and GTKs, as described above.

[21] ARTC, 2021, Hunter Valley Coal Network Access Undertaking, Version 8, Schedule I
[22] ARTC, 2021, Hunter Valley Coal Network Access Undertaking, Version 8, Schedule I

Recommendation 3:

(1) In Section 4.2, the Costing Principles should be amended to state that operating expenditures (operating costs and overhead expenditures) will be efficient and prudent. The Costing Principles should also provide more information about how ARC Infrastructure will ensure that operating expenditures are efficient and how forecasts will be developed. The Costing Principles could consider a base-step-trend approach to calculating operating expenditures. Marsden Jacob notes that Arc Infrastructure has provided information in its explanatory document (Section 4) on how it will develop forecast costs over the term of a proposal.

(2) In Section 4.2, the Costing Principles should have more information on the efficiency of maintenance costs. This was discussed in detail in the 2020 Costing Principles. For example, this could include detailing (not exhaustive): the inspection and corrective action procedures that underpins routine maintenance; the drivers of the timing of cyclical maintenance for different types of assets; and the maintenance models that will be used to ensure efficient timing of expenditures.

(3) In Section 4.2, more information should be included on the types of maintenance costs that are included and those that are not. The Costing Principles should also make it clear whether Arc Infrastructure intends to base its costs on actual costs over the relevant pricing period or apply an annualised value of a future maintenance cost over the life of an asset.

(4) In Section 4.3, the Costing Principles should make a statement that the ERA will determine the weighted average cost of capital at 30 June each year (as per clause 3 in Schedule 4 of the Code).

(5) In section 4.4, the Costing Principles should insert the words 'relevant Railway Infrastructure applicable' into the second paragraph so that it becomes:

> *For the purposes of responding to a Proposal pursuant to section 9(1)(b)(ii) of the Code, the sum of these annual depreciation amounts on the relevant Railway Infrastructure applicable, or forecast to be applicable, over the term of the Proposal comprises the return of capital component of the Capital Costs within the Total Costs to be provided to the Access Seeker.*

(6) In Section 4.5, the Costing Principles should make it clear whether Arc Infrastructure undertakes any business other than rail access and, if it does, how it intends to allocate overhead between its rail access related functions and other functions and businesses.

(7) In Section 4.6, the Costing Principles should include a definition of incremental costs that is consistent with Schedule 4 clause 1 of the Code. Specifically, that incremental costs will comprise (a) the operating costs and (b), where applicable, the capital costs; and the overheads attributable to the performance of the railway owner's access-related functions whether by the railway owner or an associate.

(8) No changes to the cost allocators in Appendix 3 are proposed by Marsden Jacob.

3.2.4 Section 47H(1)(d): Record keeping

This section reviews 47H(1)(d) which states that:

> *Each railway owner must … prepare and submit to the Regulator a statement of the principles, rules and practices (the costing principles) that are to be applied and followed by the railway owner –*
> *…*
> *(d) in the keeping and presentation of the railway owner's accounts and financial records so far as they relate to the determination of those costs.*

Relevant sections of the Costing Principles assessed in this section:

- Section 5. Cost recordkeeping

Record keeping information (Section 5 of the Costing Principles)

Arc Infrastructure Proposal

In Section 5, the Costing Principles state that the Railway Owner should keep accounts and financial records as they relate to the costs discussed in the Costing Principles which will be maintained at a level of detail required to support the practices discussed in these Costing Principles. They also state that the Railway Owner will maintain records relating to costs and provide the same to the Regulator to enable the Regulator to monitor the compliance of the Railway Owner with the provisions of the Code.

Stakeholder comments

Aurizon noted that proposed Costing Principles include '*limited detail in relation to the required cost record keeping arrangements*'. Pacific National noted that '*gas and electricity companies' applications to the Australian Energy Regulator for five-year regulatory revenue proposals and access arrangement decisions include their detailed financial model spreadsheets with workings*'.

Comparable rail framework approaches

Some of the other rail undertakings have requirements on record keeping of cost information as it relates to the RAB calculations. This is consistent with our recommendation above on providing more information on record keeping in the Costing Principles.

For example, in the Hunter Valley coal access undertaking:[23]

> *Information to be provided by ARTC:*
>
> *ARTC will provide the following information as a minimum to the ACCC in order for the ACCC to carry out its assessment …*

[23] ARTC, 2021, Hunter Valley Coal Network Access Undertaking, Version 8, Schedule G.

(b) documentation demonstrating ARTC's compliance with the annual RAB and RAB Floor Limit roll forward as set out at section 4.4(b) or section 4J.4(b) of this Undertaking (as applicable), including:

(i) an explanation of how each component (being a component used to calculate the RAB and RAB Floor Limit as set out in the formulae in section 4.4 and section 4J.4 of this Undertaking (as applicable)) of the RAB and RAB Floor Limit has been calculated in accordance with the formula in this Undertaking, and any assumptions used;

(ii) a breakdown of:

(A) values for each component of the RAB and RAB Floor Limit, including a split into the Constrained Network and non-Constrained Network and, for Capital Expenditure, values to Section and asset (project) level (where values are zero, this should be stated); and

(B) Sections that form part of the Constrained Network and Sections that do not form part of the Constrained Network;

(iii) a table summarising the values for each component of the RAB and RAB Floor Limit and the outcome of the calculations, including the average closing value for the RAB and RAB Floor Limit;

(iv) evidence of any endorsement by the RCG of any proposed Capital Expenditure and Capital Allocations where relevant;

(v) evidence of disposals value including any endorsement by the RCG of any proposed disposals, and where possible, appropriate references to the Booz Allen Hamilton DORC database which established the regulatory asset base value as at 1 July 1999, and any references to the depreciated optimised replacement cost in relation to assets in Sections not ascribed a regulatory asset value in accordance with the NSW Rail Access Undertaking in force at the time immediately preceding the Commencement Date of this Undertaking, and approved by the ACCC from time to time, and demonstrating adjustments to derive the current value of disposals. For context, the Booz-Allen and Hamilton report, Valuation of Certain Assets of the Rail Access Corporation, 14 May 2001, was the basis for the Independent Pricing and Regulatory Tribunal of NSW's June 2001 recommendation (accepted by the Minister for Transport in December 2001) which established the depreciated optimised replacement cost (DORC) value for rail assets in the Hunter Valley coal network;

(vi) the spreadsheet or other models underlying calculations (not for publication)

Marsden Jacob assessment

Marsden Jacob believes that the Costing Principles in Section 5 should provide greater specificity on information required to be kept ensuring that the right information is collected and is readily accessible for the ERA. Specifically, the Costing Principles in Section 5 should state that Arc Infrastructure will keep documentation on the RAB calculations, incremental and total costs for each route section. These calculations will show how the RAB has changed over time. This documentation should include a spreadsheet or other models that illustrate these calculations.

Recommendation 4:

(1) In Section 5, the Costing Principles specifically should state that Arc Infrastructure will keep documentation on the RAB calculations, incremental and total costs for each section. These calculations will show how the RAB has changed over time. This documentation should include a spreadsheet or other models that illustrate these calculations.

4. Section 47H(2)

4.1 Rail Access Code

The *Railways (Access) Code 2000* Section 47H(2) is shown in Box 2.

Box 2: The Railways (Access) Code 2000 Section 47H(2)

(2) The statement must –

(a) specify the route sections into which each applicable part of the railways network is divided; and

(b) describe the intended method for calculating –

(i) accumulated depreciation for the purpose of determining the depreciated optimised replacement cost of applicable railway infrastructure under section 47J(1)(a); and

(ii) depreciation for the purposes of determining the updated regulatory asset base of applicable railway infrastructure under section 47N(1) and determining the costs referred to in Schedule 4 clauses 7 and 8;

and

(c) specify if assets will be grouped for the purposes of determining the matters referred to in subsection (1)(a) to (c) and, if so, how assets will be grouped; and

(d) prohibit any double counting of assets by providing that the sum of the return of capital that is attributable to an asset over its economic life, via depreciation or otherwise, must not exceed the value of the asset at the time at which it is first included in a regulatory asset base; and

(e) prohibit the inclusion of the following in relation to contributed capital –

(i) if the contributed capital is funded wholly by an entity other than the railway owner or an associate of the railway owner — the value of the contributed capital;

(ii) if the contributed capital is funded in part by an entity other than the railway owner or an associate of the railway owner — the value of the portion of the contributed capital that is not funded by the railway owner or an associate of the railway owner.

4.2 Marsden Jacob review of Section 47H(2)

4.2.1 Section 47H(2)(a):

This section reviews 47H(2)(a) which states that:

> *The statement must – specify the route sections into which each applicable part of the railways network is divided*

Relevant sections of the Costing Principles assessed in this section:

- Appendix 1 Route Sections

Route sections (Appendix 1 of the Costing Principles)

Arc Infrastructure Proposal

Appendix 1 in the Costing Principles defines the route sections for which a regulatory asset base will be developed.

Stakeholder comments

CBH and Aurizon both indicate that further information should be provided regarding the application of the route sections in Appendix 1 as some route sections are defined by a single location. Aurizon also questioned the practicality of having a large number of route sections which may result in unnecessary complexity. CBH also suggests including in the Costing Principles a practical example of how a line section will be grouped to ensure correct interpretation.

Marsden Jacob assessment

Some of the route sections in Appendix 1 require more explanation as it is not clear how they work in practice.

For example, under Code Route 1, Merredin is listed as a route section. Direct discussions with Arc Infrastructure have indicated that the Merredin route section applies when specific railway infrastructure is used at Merredin. This information should be placed in the Costing Principles, along with a description of the type of infrastructure to which it applies. Marsden Jacob notes that this recommendation has been addressed in Arc Infrastructure's explanatory document (Appendix 1).

Marsden Jacob notes that there are a significant number of route sections defined in Appendix 1. This results in a RAB for each of these route sections and could result in a significant administrative burden for Arc Infrastructure. While Marsden Jacob has not made a recommendation on this point, as a general comment, Marsden Jacob would make the observation that it is unclear to us whether this level of disaggregation of the network delivers benefits that outweighs the costs.

Recommendation 5:

(1) In Appendix 1, the Costing Principles should include more information on route sections which comprise a single name for the route, including how they are defined and distinguished from other route sections. Marsden Jacob notes that this recommendation has been addressed in Arc Infrastructure's explanatory document (Appendix 1).

4.2.2 Section 47H(2)b(i): Accumulated depreciation

This section reviews 47H(2)b(i) which states that:

> describe the intended method for calculating —
> (i) accumulated depreciation for the purpose of determining the depreciated optimised replacement cost of applicable railway infrastructure under section 47J(1)(a); and

Relevant sections of the Costing Principles assessed in this section:

- Section 2.7 Accumulated Depreciation
- Appendix 2 – Standard Effective Life

Accumulated depreciation (Section 2.7 of the Costing Principles)

Arc Infrastructure Proposal

In Section 2.7, the Costing Principles states that the optimised replacement cost will be depreciated to reflect the Railway Infrastructure's Economic Life as at the Valuation Date.

They further state that, in determining the economic life of an asset, the railway owner will:

- firstly, consider the current physical condition of the asset;
- secondly, consider the forecast rate at which the asset will be consumed; and
- finally, develop the projected life of the asset based on the current physical condition of the asset and forecast rate of consumption.

The Costing Principles then say that, upon determining the projected life of the asset, the Railway Owner will compare the projected life of the asset to the Standard Effective Life and reduce the optimised replacement cost for that asset proportionally.

Stakeholder comments

CBH recommends that the Costing Principles state that '*the DORC of an asset is the ORC multiplied by the ratio of the remaining life to the Standard Design Life (currently referred to as Standard Effective Life).*' CBH also suggests that the Costing Principles explain the approach that will be taken to assess the physical condition of assets, including differences across the network.

Marsden Jacob assessment

Marsden Jacob believes that more information should be provided in Section 2.7 of the Costing Principles to clarify how the projected life and standard effective life are used to estimate accumulated depreciation. This is because how accumulated depreciation is calculated using the projected life and standard effective life is not entirely clear from Section 2.7. Moreover, Marsden Jacob recommend that the wording in Section 2.7 is complemented by a formula which shows the calculation of how accumulated depreciation is calculated for the optimised replacement cost and how it then impacts the DORC. A worked example would also be useful.

For example, the method described in Section 2.7 of the Costing Principles should state the following formula (or similar) that illustrates how the DORC will be calculated for each route section:

- DORC (each route section) = sum of DORC for each asset
- DORC of each asset = Optimised replacement cost of each asset X (1- accumulated depreciation of each asset (%))
- Accumulated depreciation (%) of each asset = ((Standard Effective Life – Projected Life of the Asset) / Standard Effective Life of the asset)
- The DORC of each route section aggregates to a total DORC of all railway infrastructure.
- Standard Effective Life is the expected life of a new optimised modern equivalent asset, which takes into account design life and usage.
- The Projected life of an asset is its remaining economic life given how much of the asset has already been consumed.

This formula (and definitions of standard effective life and projected life) is consistent with the underlying method in MJA (2013)[24].

Section 2.7 should also provide more detail on how the current physical condition of the asset will be established (including for different route sections), which is needed to estimate the projected life of the asset.

Standard effective lives (Appendix 2 of the Costing Principles)

Arc Infrastructure Proposal

In Appendix 2 – Standard Effective Life, the Costing Principles states the values for the standard effective lives that will be used to calculate accumulated depreciation.

[24] Marsden Jacob (2013), Review of Australian Rail Track Corporation's valuation for the Gap to Turrawan Section of the Hunter Valley rail network, Report prepared for the Australian Competition and Consumer Commission, page 15, https://www.accc.gov.au/by-industry/rail-shipping-and-ports/hunter-valley-rail-network-access-undertaking/gap-to-turrawan-variation-2014/position-paper, page 12 and example on page 38

Stakeholder comments

CBH recommends that, where relevant, the asset lives in Appendix 2, are differentiated by narrow gauge and standard gauge. CBH also indicated in its submission some recommended changes to the assets lives (Table 2 of the CBH submission).

Both CBH and Aurizon are of the view that the earthworks should have a value of 100 years rather than being perpetual. Aurizon states that this is more consistent with other DORC valuations of rail infrastructure.

CBH also suggest in Table 2 of their submission that there is a range of other assets which should have a higher standard effective lives than in the Costing Principles (such as stations and platforms, signalling systems and access roads).

Marsden Jacob assessment

The information presented on Standard Effective Life in Appendix 2 of the Costing Principles has some differences from the 2020 Costing Principles (Annexure 7.1). A summary of the key differences between what was stated in the 2020 Costing Principles and the 2024 Costing Principles is shown in Table 3.

A direct discussion with Arc Infrastructure revealed that these changes were made because of ARC Infrastructure's learned experience in managing these type of assets. Additionally, the difference for steel sleepers is because they are no longer combined with timber sleepers in the definition. While these explanations seem reasonable, Marsden Jacob notes that it has not undertaken an independent assessment of the historical performance of Arc Infrastructure's different asset types.

Table 3: Changes in Standard Effective Life

Asset class		2020 Costing Principles	2024 Costing Principles
Earthworks		100 years	Perpetual
Steel sleepers		30 years (1:2 steel) and 25 years (1:4 steel)	40 years
Timber sleepers		20 years	15 years
Ballast		25 years	50 years
Rail	Curve < 400m	6 to 15 years depending on MGT	10 years
	Curve 400-800m	10 to 30 years depending on MGT	15 years
	Curve > 800m & Tangent	60 to 70 years depending on MGT	70 years
Turnouts	Concrete Bearers	30 to 40 years depending on MGT	40 years
	Timber Bearers	12 to 18 years depending on type and MGT	15 years
Communications		20 years	15 years

Note: MGT is million gross tonnes

Notably, three of the significant changes in standard effective life values from the 2020 to the 2024 Costing Principles are earthworks, ballast and timber sleepers, noting that the change in steel sleepers is caused by a change in the definition from 1 in 3 or 1 in 4 sleepers being steel to just referring to steel sleepers.

With respect to earthworks, Marsden Jacob's view is that standard effective life should be changed in the Costing Principles to 100 years given that most DORC valuations of rail infrastructure have assumed a 100 year life and that the previous 2020 Costing Principles had a value of 100 years. This was illustrated in the Aurizon submission.

With respect to ballast, the 50 year ballast life proposed by Arc Infrastructure is high relative to some other rail systems (Aurizon, Queensland Rail, Gap to Turrawan DORC assessment), but low relative to ARTC (Table 4). However, comparisons across different rail infrastructure track are challenging as ballast life depends on a range of factors, including: the nature of the commodity being transported; the type and quality of material used; climatic conditions; and the amount of traffic on the rail. Therefore, the values stated in Table 4 will likely vary across a rail infrastructure manager's network, depending on the above mentioned factors.

To illustrate the difficulties in making comparisons, Aurizon's low values could be explained by factors specific to their rail network. For example, their network has high traffic levels, high axle loads and issues with ballast fouling due to coal infiltration.

As a result, Marsden Jacob concludes that the proposed ballast life of 50 years is within the bounds of what could be reasonable.

Table 4: Ballast life comparison

Rail infrastructure manager	Ballast useful life (years)
Arc Infrastructure (2020 Costing Principles)	25
Arc Infrastructure (2024 Costing Principles)	50
Queensland Rail (2023)[25]	30
Aurizon (2023) [26]	8 to 20
ARTC (2023)[27]	60
Gap to Turrawan DORC (2013)[28]	40

With respect to timber sleepers, comparisons with other rail infrastructure owners are challenging as they generally refer to sleepers as a general category – rather than breaking it up into concrete, steel

[25] Queensland Rail (2023), Queensland Rail Annual Report, 2022-2023
[26] Aurizon (2023), Aurizon Annual Report, 2022-2023
[27] ARTC (2023), ARTC Annual Report, 2022-2023
[28] Marsden Jacob (2013), Review of Australian Rail Track Corporation's valuation for the Gap to Turrawan Section of the Hunter Valley rail network, Report prepared for the Australian Competition and Consumer Commission, page 29, https://www.accc.gov.au/by-industry/rail-shipping-and-ports/hunter-valley-rail-network-access-undertaking/gap-to-turrawan-variation-2014/position-paper

and timber. Additionally, the life of a timber sleeper is influenced by a range of factors, including: species and quality of timber; climatic conditions; drainage; and the amount of traffic on the rail.

Marsden Jacob notes that useful lives for timber sleepers are typically stated at between 10 and 20 years. On this basis, the 15 year value proposed by Arc Infrastructure is within the bounds of what could be considered reasonable.

With regard to stating different asset lives for narrow and standard gauge, Marsden Jacob would observe that it is unclear to us whether there are material differences in the standard effective life values of assets for narrow and standard gauge track – noting that intuitively it would make sense for differences to be present for some asset types given the likely difference in traffic for the two types of track. Where there are material differences in asset lives due to forecast consumption levels, the Costing Principles should state different standard effective live values for narrow and standard gauge tracks.

Standard effective lives (Appendix 2 of the Costing Principles) – Note 2

Arc Infrastructure Proposal

Note 3 to the table in Appendix 2 refers to condition when defining standard effective life:

> *The Standard Effective Lives above are generally indicative for the relevant Asset Class and Asset Group. Application of these lives will take various factors including but not limited to condition, use and asset attributes into account.*

Stakeholder comments

CBH recommends removing the word 'condition' from note 3 in Appendix 2 as the condition of the asset is considered when determining its projected life.

Marsden Jacob assessment

The use of the word 'condition' in Note 3 in Appendix 2 is inconsistent with the purpose of Appendix 2. This is because Standard Effective Live, as earlier discussed, should be the expected life of a new modern equivalent asset and, therefore, condition is not relevant.

Recommendation 6:

(1) In Section 2.7, the Costing Principles should be complemented by a formula which shows the calculation of how accumulated depreciation is calculated for the optimised replacement cost and how it then impacts the DORC. See above for more information on this.

(2) In Section 2.7, the Costing Principles should provide more detail on how the current physical condition of the asset will be established (including for different route sections).

(3) In Appendix 2, the Costing Principles should make it clear that the Standard Effective Lives are those that equate to a new optimised Modern Equivalent Asset. Consistent with this, the use of the word 'condition' in Note 3 of Appendix 2 should be removed.

(4) In Appendix 2, the Costing Principles should state different standard effective live values for narrow and standard gauge tracks where there are material differences in asset lives due to forecast consumption levels.

4.2.3 Section 47H(2)b(ii): Depreciation for determining updated regulatory asset base

This section reviews 47H(2)(b)(ii) which states that:

> (b) describe the intended method for calculating —
> (ii) depreciation for the purposes of determining the updated regulatory asset base of applicable railway infrastructure under section 47N(1) and determining the costs referred to in Schedule 4 clauses 7 and 8;

Relevant sections of the Costing Principles assessed in this section:

- Section 3.5 Depreciation

Depreciation (Section 3.5 of the Costing Principles)

Arc Infrastructure Proposal

In Section 3.5, the Costing Principles describes how assets will be depreciated and the circumstances under which the Railway Owner may change an asset's economic life.

Stakeholder comments

Both CBH and Aurizon indicate that straight line depreciation should be applied in depreciating assets.

CBH further recommends that the following words are removed from the dot point that states how the railway owner may change an asset's economic life: *"or where the Railway Owner expects that it would not continue to manage and control the use of the Route."*

Comparable rail framework approaches

Marsden Jacob notes that straight line depreciation is used in the Hunter Valley Coal Network Access Undertaking[29].

Marsden Jacob assessment

The depreciation method described in section 3.5 of the Costing Principles is consistent with the Code, with the exception that:

- The approach to depreciation should be more clearly stated. For example, whether the approach is distributed uniformly (which could be interpreted as straight line depreciation) or some other method is used. Where a mix of approaches are intended to be applied, the Costing Principles could give some indication as to the circumstances under which they would apply.
- 'For access prices to vary over time' should be changed to 'is designed so that access prices will vary over time in a way that promotes efficient growth in the market for rail access', which is consistent with Section 47K(5)(d) of the Code.
- "or where the Railway Owner expects that it would not continue to manage and control the use of the Route" should be removed from the Costing Principles in Section 3.5 as it is not consistent with Section 47K(6) of the Code and does not necessarily relate to a stranded asset which is generally regarded as one which has no future use.

Recommendation 7:

(1) In Section 3.5, the Costing Principles should be amended to state the depreciation approach more clearly. For example, whether the approach is distributed uniformly (which could be interpreted as straight line depreciation) or some other method is used. Where a mix of approaches are intended to be applied, the Costing Principles could give some indication as to the circumstances under which they would apply.

(2) In Section 3.5, the words 'For access prices to vary over time' should be changed to 'is designed so that access prices will vary over time in a way that promotes efficient growth in the market for rail access'.

(3) In Section 3.5, the Costing Principles should remove the following "or where the Railway Owner expects that it would not continue to manage and control the use of the Route"

4.2.4 47H(2)(c): Grouping of assets

This section reviews 47H(2)(c) which states that:

> (c) specify if assets will be grouped for the purposes of determining the matters referred to in subsection (1)(a) to (c) and, if so, how assets will be grouped; and

29 ARTC, 2021, Hunter Valley Coal Network Access Undertaking, Version 8, Section 4J.7

Supporting this is Section 47H(4) (a) to (c) of the Code which states that:

> *If the statement specifies that assets will be grouped for the purpose of determining the depreciated optimised replacement cost of applicable railway infrastructure, the Regulator must not approve the statement under subsection (3)(a) unless the Regulator is satisfied that —*
>
> *(a) assets will only be grouped with other assets that are —*
>
> *(i) in the same route section; and*
>
> *(ii) the same, or a similar, category of railway infrastructure; and*
>
> *(iii) of a similar age and condition; and*
>
> *(b) assets will not be grouped in a way that will result in access holders paying for assets they do not use; and*
>
> *(c) assets will not be grouped in a way that will interfere with the Regulator's ability to monitor compliance by the railway owner with the provisions of this Code.*

Relevant sections of the Costing Principles assessed in this section:

- Appendix 2 Standard Effective Life
- Section 3.5 on Depreciation

Grouping of assets (Section 3.5 and Appendix 2 of the Costing Principles)

Arc Infrastructure Proposal

In Section 3.5, the Costing Principles indicates that assets will be grouped for the purpose of developing the DORC:

> *The Depreciation Schedule will set out the depreciation to be applied against particular assets within relevant Asset Groups over their Economic Life.*

Moreover, assets are grouped in Appendix 2 for the purposes of stating the Standard Effective Life.

Stakeholder Comments

There were no stakeholder comments directly addressing this matter.

Marsden Jacob assessment

Considering that the Costing Principles in Section 3.5 indicates that assets will be grouped to determine depreciation, the Costing Principles should be amended in Section 3.5 to state assets grouped for the purpose of determining depreciation will be grouped if they are *(i) in the same route section; (ii) the same, or a similar, category of railway infrastructure; and (iii) of a similar age and condition.* This ensures that the Costing Principles is consistent with the Code (Section 47H(4) (a) to (c)).

Recommendation 8:

(1) In Section 3.5, the Costing Principles should state that in calculating deprecation, assets will be grouped if they are (i) in the same route section; (ii) the same, or a similar, category of railway infrastructure; and (iii) of a similar age and condition.

4.2.5 47H(2)(d): Prohibition of double counting of assets

This section reviews 47H(2)(d) which states that:

> (d) prohibit any double counting of assets by providing that the sum of the return of capital that is attributable to an asset over its economic life, via depreciation or otherwise, must not exceed the value of the asset at the time at which it is first included in a regulatory asset base; and

Relevant sections of the Costing Principles assessed in this section:

- Section 3.5 Depreciation (assessed in this section only with regard to double counting)
- Section 5.1 Double Counting

Depreciation (Section 3.5 and 5.1 of the Costing Principles)

Arc Infrastructure Proposal

Section 3.5 of the Costing Principles states that:

> *Having determined the applicable depreciation for the asset (by reference to the Depreciation Schedule), the amount of depreciation attributable to the asset in the Relevant Period will be calculated by combining the value of the asset that was added to the RAB with the relevant depreciation figure according to the applicable Depreciation Schedule. In the event the remaining value of the asset to be depreciated is less than this amount, the lesser value will be used, in compliance with the double counting provisions in section 47F of the Code.*

Stakeholder Comments

There were no stakeholder comments directly addressing this matter. Refer to an earlier section for stakeholder comments on other depreciation issues.

Marsden Jacob assessment

The following paragraph in Section 3.5 of the Costing Principles would benefit from a formula to explain its application:

> *Having determined the applicable depreciation for the asset (by reference to the Depreciation Schedule), the amount of depreciation attributable to the asset in the Relevant Period will be calculated by combining the value of the asset that was added to the RAB with the relevant depreciation figure according to the applicable Depreciation Schedule. In the event the*

remaining value of the asset to be depreciated is less than this amount, the lesser value will be used, in compliance with the double counting provisions in section 47F of the Code.

For example, the formula could state:

Depreciation attributable to an asset = Value of the asset added to the RAB multiplied by Depreciation (%) as according to the applicable depreciation schedule.

Double counting (Section 3.5 and 5.1 of the Costing Principles)

Arc Infrastructure Proposal

In Section 5.1, the Costing Principles state that the Railway Owner will keep records of depreciation incurred in a manner which allows it to prevent Double Counting from occurring.

Section 3.5 also states that the depreciation schedule should provide for an asset to be depreciated only once over its Economic Life, such that the Railway Owner may not recover a sum exceeding the value of the asset that was added to the RAB.

Stakeholder Comments

There were no stakeholder comments directly addressing this matter. Refer to an earlier section for stakeholder comments on other depreciation issues.

Marsden Jacob assessment

While the Costing Principles in Section 5.1 and 3.5 provide useful guidance, to ensure complete clarity on double counting, the Costing Principles should make clearer statements about double counting in Section 5.1. For example, the costing principles should make it clear that an asset will only be added once to the initial RAB or updates to the RAB and that the sum of depreciation used over the economic life of an asset for depreciation purposes will not exceed its initial DORC value.

Recommendation 9:

(1) In Section 3.5, a formula should be added to the Costing Principles that states:

Depreciation attributable to an asset = Value of the asset added to the RAB multiplied by Depreciation (%) as according to the applicable depreciation schedule.

(2) In Section 5.1, the Costing Principles should be amended to make it clear that the asset will only be added once to the initial RAB or updates to the RAB and that the sum of depreciation used over the life of an asset for depreciation purposes will not exceed its initial DORC value.

4.2.6 47H(2)(e): Contributed captial

This section reviews 47H(2)(e) which states that:

prohibit the inclusion of the following in relation to contributed capital —
(i) if the contributed capital is funded wholly by an entity other than the railway owner or an associate of the railway owner — the value of the contributed capital;
(ii) if the contributed capital is funded in part by an entity other than the railway owner or an associate of the railway owner — the value of the portion of the contributed capital that is not funded by the railway owner or an associate of the railway owner.

Supporting this is Section 47B of the Code which states that:

> *Contributed capital means railway infrastructure that has been funded wholly or in part by an entity other than the railway owner or an associate of the railway owner, including by the entity doing any of the following —*
>
> *(a) providing cash or in-kind contributions to the railway owner or an associate of the railway owner;*
>
> *(b) undertaking work, or paying for work to be undertaken, for the railway owner or an associate of the railway owner;*
>
> *(c) making payments to the railway owner or an associate of the railway owner that —*
>
> *(i) fund the recovery of capital in relation to the railway infrastructure; and*
>
> *(ii) are not payments of prices and charges for access*

Relevant sections of the Costing Principles assessed in this section:

- Section 2.4 Contributed Capital – Initial RAB
- Section 3.4 Contributed Capital – Capital expenditure

Contributed capital (Section 2.4 and 3.4 of the Costing Principles)

Arc Infrastructure Proposal

In Section 2.4, the Costing Principles explains how Contributed Capital will be excluded from the initial RAB. In particular, the Costing Principles state that:

> *The Railway Owner will adjust the Initial RAB to exclude any Railway Infrastructure that has been funded by Contributed Capital. The Railway Owner will reduce the replacement cost of the asset equivalent to the proportion of the original development cost in respect of the particular asset that was funded by another entity. Where:*
>
> - *the entirety of an asset was funded by others, 100% of the contribution value will be removed from the asset replacement cost; or*
> - *part of an asset was funded by others, the asset replacement cost will be reduced in respect of that asset at a rate proportional to the percentage funded by others.*

In Section 3.4, the Costing Principles explains how Contributed Capital will be excluded from capital expenditure. In particular, the Costing Principles state that:

> *The Railway Owner will reduce the Capital Expenditure equivalent to the proportion of the original Capital Expenditure in respect of the particular asset that was funded by another entity. Where:*
>
> - *the entirety of an asset was funded by others, 100% of the contribution value will be removed from the Capital Expenditure; or*
> - *part of an asset was funded by others, the Capital Expenditure will be reduced in respect of that asset at a rate proportional to the percentage funded by others.*

In its explanatory document (Section 2.4), Arc Infrastructure provide an example to illustrate the application of the adjustment for Contributed Capital:

> *Assume a third party has historically contributed $100m to fully fund the construction of a Railway Infrastructure asset which has a MEA replacement cost of $200m at the Valuation Date. In this circumstance, the Initial RAB will be adjusted to remove the full $200m value of the asset at the Valuation Date.*
>
> *Assume a third party has historically contributed $50m towards the construction of a $100m Railway Infrastructure asset, funding 50% of the total asset. The MEA replacement cost of the total asset at the Valuation Date is $200m, double the value at the time of the investment. In this circumstance, the Initial RAB will be adjusted to remove 50% of the full value of the asset at the Valuation Date, being an adjustment of $100m.*

Stakeholder comments

CBH and Aurizon both raise concerns about statements made in the Costing Principles about contributed capital and how it is excluded from the initial RAB under Section 2.4. In particular, they state that Section 2.4 should clarify whether the "contribution value" is the amount of funds that were originally contributed or the current replacement cost of the funded assets.

Marsden Jacob assessment

To avoid confusion, the Costing Principles (in Section 2.4) should be amended so that it is clear that the 'value of the contributed capital' referred to in the Code (Section 47H (2)) is the optimised replacement cost of the asset that was funded, where the asset was funded entirely by others. Additionally, Section 2.4 should state that where the asset was part funded, the value of the contributed capital is equal to the total optimised replacement cost of the asset that was funded by all contributors (including Arc Infrastructure) multiplied by the proportion of the original cost of the asset that was funded by others. Similar changes should be made to Section 3.4 of the Costing Principles.

The Costing Principles would benefit from a worked example to illustrate how this would work in practice. Marsden Jacob notes that this recommendation has been addressed in the explanatory document prepared by Arc Infrastructure (Section 2.4). However, Marsden Jacob further recommends the use of the words 'optimised MEA replacement cost' in the explanatory document

rather than just 'MEA replacement cost' as the optimised asset value may be different to one that is not.

Additionally, in Section 2.4, the Costing Principles should be amended so that information from the definition in section 47B of the Code is included, which provides further information on the definition of contributed capital.

Recommendation 10:

(1) The Costing Principles (in Section 2.4) should be amended so that it is clear that the 'value of the contributed capital' referred to in the Code (Section 47H (2)) is the replacement cost of the asset that was funded, where the asset was funded entirely by others. Additionally, Section 2.4 should state that where the asset was part funded, the value of the contributed capital is equal to the replacement cost of the asset that was funded multiplied by the proportion of the original cost of the asset that was funded by others. Similar changes should be made to Section 3.4 of the Costing Principles. The Costing Principles would benefit from a worked example to illustrate how this would work in practice. Marsden Jacob notes that this recommendation has been addressed in the explanatory document prepared by Arc Infrastructure (Section 2.4). However, Marsden Jacob further recommends the use of the words 'optimised MEA replacement cost' in the explanatory document rather than just 'MEA replacement cost' as the optimised asset value may be different to one that is not.

(2) In Section 2.4, the Costing Principles should be amended so that Information from the definition in section 47B of the Code is included, which provides further information on the definition of contributed capital.