RP INFRASTRUCTURE

Initial Report (Review of Arc Infrastructure's Sections 47J and 47K submissions) FINAL

ERA2024213 Provision of Technical Advice for an Initial Regulatory Asset Base (IRAB) Determination for Railways

Economic Regulation Authority

08 January 2026

PROJECT INFORMATION	
Client:	Economic Regulation Authority
Project Name:	Provision of Technical Advice for an Initial Regulatory Asset Base (IRAB) Determination for Railways

DOCUMENTATION INFORMATION		
Revision	Document No.	Document Title
Rev 2	20250901 RPI ERA2024213	Draft Report - Review of Railway Owner's Submission
Rev 3	20250904 RPI ERA2024213	Draft Report – Review of Railway Owner's Submission v3
Rev 4	20260106 RPI ERA2024213	Report – Review of Railway Owner's Submission v4

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Executive Summary

The purpose of this report is to provide the Economic Regulation Authority [ERA] with a review of Arc Infrastructure's [Arc] Section 47J and 47K submissions (6 June 2025), considering the various stakeholder submissions. This draft report aims to verify the reasonableness, transparency and alignment of the valuation with regulatory, technical and economic principles reflected in the Railways (Access) Code 2000 (The Code) and amendments to the Railway (Access) Code (December 2023), as well as the revised costing principles submitted by Arc to the ERA (May 2024) and approved by the ERA following submissions by access holders and subsequent amendments (published November 2024).

The report highlights the observed misalignments or inconsistencies within the railway owner's submission, along with providing technical advice which the ERA may wish to consider in its final responses to issues raised by stakeholders.

RP Infrastructure (RPI) has undertaken an extensive bottom-up review of the direct job cost unit rates (generally adopting the quantities used by Arc), including relevant indirect job cost uplift factors to assess Arc's Construction Replacement Cost (CRC). The alternative values put forward in this report are indicative only. RPI's engagement was to provide a review of Arc's proposed Depreciation Optimised Replacement Cost (DORC), rather than a complete valuation of the DORC.

The table below provides a summary of the key components of the DORC and our estimated alternative values based on our initial analysis of the information available at the time of this assessment.

Comparison Arc DORC vs RPI DORC (indicative) – by key components

Comparison Arc DORC vs RPI Indicative DORC					
Component	**Arc**	**RPI**	**Diff $**	**Diff %**	**Notes / Comments**
Construction Replacement Cos	$19,876.5m	$18,460.5m	-$1,415.9m	-7.12%	Re-estimated using a bottom-up approach to unit rates and quantities for MEA
Railway Owners Cost	$3,844.9m	$3,562.9m	-$282.0m	-7.33%	Applied 19.3% uplift to the RPI's estimate of CRC
Alternative Procurement Cost Savings	-$2,650.3m	$0.0m	$2,650.3m	-100.00%	RPI does not endorse the methodology used by Arc
Optimisation[a]	-$158.1m	-$3,739.8m	-$3,581.7m	2265.47%	Revised the assets that were redundant by substituting non-operational routes for Arc's optimized loops. Retained some of Arc's proposed optimization
Contributed Assets	$0.0m	-$1,431.7m	-$1,431.7m	N/A	Published evidence and stakeholder feedback suggesting contributed assets
Sub-total - ORC excl funding costs	**$20,913.0m**	**$16,851.9m**	**-$4,061.0m**	**-19.42%**	
Funding Costs	$9,140.8m	$3,582.7m	-$5,558.1m	-60.81%	RPI does not endorse the methodology used by Arc
Sub-total - ORC incl funding costs	**$30,053.8m**	**$20,434.6m**	**$9,619.1m**	**32.01%**	
Depreciation ORC (incl funding costs)	-$14,760.8m	-$8,578.7m	$6,182.1m	-19.39%	Results from applying depreciation to RPI's ORC (inclusive of funding costs) and depreciating at an asset group level by route sections. It assumes the same depreciation rates for funding costs at a route section level. Acceleration is applied to achieve the desired outcomes of the *Railway (Access) Act 1998* and the Code.
Acceleration of depreciation for routes experience significant declines in GTK (past 5 yrs)	$0.0m	-$3,319.8m	-$3,319.8m		
Opex adjustments	-$30.2m	-$30.2m	$0.0m	0.00%	RPI has not changed the opex adjustments
DORC	**$15,262.8m**	**$8,505.9m**	**-$6,756.8m**	**-44.27%**	**The change in DORC resulting from all of the above changes**

As a result of the revisions to some of the DORC components outlined below, RPI estimates the DORC to be $8,506m a downward revision of $6,757m from Arc's DORC of $15,263m (a decline of 44%). Each of the DORC components is briefly described below.

Construction Replacement Costs

Each of the specific asset classes were reviewed at a direct job cost unit rate level to provide a comparable and relevant construction replacement cost valuation. Across the 20 separate asset classes contained within the Arc submission (19 excluding platforms which had no value), 9 asset class valuations were considered reasonable with their respective values adopted, 7 asset class valuations were increased, and 3 asset classes valuations were decreased. This resulted in a relatively small overall reduction in the construction replacement cost from $19,876.5m to $18,461m (a reduction of $1,416m or -7%).

Unit rates were generally applied to the stated quantities with the resulting totals being adjusted by the same percentage markup allowances for the following factors, except the contractor preliminaries, which we reduced from 30% to 25% as being a typical markup for preliminaries on major infrastructure works, and 30% to 10% for signalling and communications assets. These allowances are based on a managed contractor approach for the latter asset group:

- Location adjustment factors based on geographic regions (with factors higher the further away the construction is from urban centres and applying to plant, material and labour)
- Overheads and profit applied at 9.5% of direct job costs
- Contractor preliminaries applied at 25% of direct job costs and 10% for signalling and communication assets (a decrease from 30%, noting that the unit rates for signalling works also includes the Specialist subcontractor's overheads and margin allowances)
- Contractor's risk premium applied at 5% of direct job costs (the risk included in contractor's tender pricing)

Railway Owner costs

These direct costs were then increased by an overall factor of 19.3% to allow for railway owner costs, with RPI supporting the percentage adopted by Arc, based on historic benchmarking values for Railway Owner's costs (ROCs) for major infrastructure construction projects.

Alternative procurement cost savings

We rejected Arc's proposed alternative procurement cost savings of $2,650m on the grounds that the unit rates are understood to be efficient and the lowest cost rates, rendering this component unnecessary and unjustified. We also note it is incompatible with the assumption of 4-year construction periods used to estimate funding costs. Different assumptions can be used to estimate funding costs which may have different implications for alternative procurement cost savings. We note that any assumption around centralised procurement would need to consider a potential impact on the unit rates themselves.

Optimisation of the asset base

RPI's review of optimisation resulted in a changed approach, which ultimately increased optimisation from Arc's $158.1m to $3,740m, an increase of $3,582m.[1] We agreed with Arc's contention that the current level of service capacity would meet the reasonably forecast demand for freight for the next ten years (based on the forecast demand for rail freight services to 2035 under the central scenario forecasts developed by BITRE from 2020 to 2035).

With respect to the selection of Alternative A or Alternative B for the Signalling and Communications costs, RPI was advised by the ERA to use Alternative A as nominated by Arc since Alternative B would require above-the-rail asset modifications. We note that a more detailed analysis would consider the relative costs of both alternatives in terms of both below-the-line and above-the-line rail costs before determining which alternative represents the lower cost for access holders or potential access holders.

RPI then considered the level of capital upgrades associated with the network based on publicly available, historical information, some of this provided in earlier reports by Arc themselves, and information provided in stakeholder submissions, with some of this subject to confidentiality requirements. We have allowed for contributed assets of

[1] Note that Arc's optimization figure of $158.1m was used in the executive summary, while optimization of $2,808m was used in chapter 5 of their Arc's proposal. In response to RPI's clarification questions, Arc confirmed that the latter figure was inclusive of the alternative procurement cost savings which RPI has separated out in Table 1.

$1,422m, with this approximately equal the level of expenditure estimated to represent capital upgrades in our comparables analysis.

Funding Costs

A significant difference in value was found for the estimate of funding costs, with RPI positing:

- An 11 year duration rather than an 18 year duration
- 4-year construction periods (rolling across the proposed capital expenditure profile)
- An exclusion of the initial five years allowed by Arc for planning and approvals and the costs associated with these
- A reduction of 2 years duration associated with RPI's approach to optimisation and an additional half year reduction in duration related to an incorrect measure of track km in Arc's modelling (5,560km versus 5,270km)

RPI applies this approach to the estimated ORC less contributed assets which results in a reduction of funding costs from $9,141m to $3,583m (a reduction of $5,558m, equates to 61%), with this figure amounting to 21% of RPI's ORC (excluding contributed assets). In line with regulatory precedents, we have allocated these costs by the weighted average ORC less contributed asset values across each route section.

Depreciation

In reviewing Arc's depreciation, we applied the remaining lives on an asset-type basis for the network as a whole and across each route section. This resulted in 42% of the network being depreciated, compared with 49% of the network being depreciated using Arc's approach to depreciation. Unlike Arc's proposal, RPI also depreciated funding costs so that users are not charged twice for the same cost, with these costs allocated to route sections based on the weighted ORC value for each route. This had the effect of reducing depreciation from Arc's estimated depreciation of $14,761m to $8,579m (a reduction of $6,182m), bearing in mind these estimates are not like-for-like given we have depreciated funding costs.

RPI undertook an analysis of demand trends using GTK figures by route sections from 2015 – 2024 which the ERA may consider in addressing factors outlined in Section 20 of the Act. Our analysis considers the long-term historical trends for rail freight demand (with an average annual decline of 4.4% pa across the network), in addition to changes occurring during the most recent 1-, 3- and 5-year periods (both in terms of percentage change and compound average growth/decline). Many routes have experienced significant declines consistently during the last five years, with others displaying declines with more variability. We considered the "notable changes to historical demand" provided by Arc in their response to the s21 (1) request by the ERA. While these highlighted those routes where there is greater variability (with some cessations offset by commencements), we find that there is sufficient reason to accelerate depreciation on those routes experiencing the greatest declines. Doing so may mitigate the risk of asset stranding and increase the contestability on these routes, with positive implications for current and potential access users as well as the regional and broader economies dependent on a thriving economy for their economic and social welfare.

We propose that the ERA apply this acceleration in three separate bands:

- Band 1 – no acceleration
- Band 2 – 1.5 times straight-line (SL) depreciation
- Band 3 – 2 times straight-line (SL) depreciation

[redacted]

[redacted]

Operating expenditure savings

RPI has not made changes to Arc's adjustment for operating costs and believes any changes would be immaterial to the review outcomes. This is because we have substituted non-operational routes for optimised loops in the optimisation component, such that there would not be a significant impact on operating costs. Additionally, RPI considers that the MEA adopted for the various asset groups is also unlikely to materially change future operating costs.

Contributed Assets

RPI's assessment of contributed assets is based on publicly available information and stakeholder submissions. Based on both, we estimate contributed assets to be approximately $1,432m. These have been allocated to the relevant route sections.

Comparative Analysis

We compared Arc's proposed DORC with that estimated for the Australian Rail Track Corporation (ARTC) in July 2019 for the ACCC, with GHD Advisory the consultants for both. In addition, we undertook a high-level comparative analysis of Construction Replacement Cost (CRC) estimates and Railway Owner Costs with the estimates of Gross Replacement Value (GRV) and corresponding owner costs used in previous ERA determinations. The estimates for the latter are adjusted for factors that could explain differences over time (namely cost escalation and capital upgrades) and bearing in mind GRV is pre-depreciation with different approaches used for incorporation of ROCs (referred to as Design, Construct and Project Management Costs (DCPM)) and interest costs. A more detailed comparative analysis of a sample of routes subject to the 2013 Access Price Determination is also undertaken, with the routes in this determination accounting for just over three quarters of the overall network, with the sample used accounting for approximately 30% of the overall network.

The table below presents a high-level comparison with the ARTC DORC outcomes and compares the various components with Arc's estimates and RPI's indicative values. The ARTC DORC has been scrutinised for correct application of regulatory procedures to arrive that the valuation in 2021. We have only escalated the estimate of RAB $m/tkm cost for comparison purposes, with our focus on the relative proportions of each DORC component for the remainder of this analysis.

High-level comparisons - ARTC DORC July 2019 vs Arc DORC vs RPI indicative value

High-level comparison - ARTC July 2019 DORC and Arc DORC vs RPI Indicative DORC (2024)												
Total km	**Total replacement cost (CRC+ROC)**	**Optimisation (% of Total RC)**	**Alternative procurement cost savings**	**Contributions (incl grants)**	**Total optimised replacement cost (excl contrib)**	**IDC & % of Total ORC**	**Total ORC incl IDC**	**Deprecn (pre-accel)**	**Deprecn (post-accel)**	**OPEX Savings (% of Total DORC incl IDC)**	**RAB (% of Total RC)**	**RAB/km**
ARTC 8500km	**$18,387**				**$17,628.7**		**$20,978.1**				$10,248.6	$1.21
		-$475.4	*na*	*-$283.3*		*$3,066.1*		*-$10,404.7*	*na*	*-$41.6*		*Escalated 23.8% to valuation date*
		-2.6%		*-1.5%*		*17%*		*-49.6%*			*56%*	**$1.49**
Arc 5270km	**$23,721**				**$20,913**		**$30,054**				$15,263	**$2.90**
		-$158	-$2,650	$0		*$9,140.8*		*-$14,761*	*na*	*-$30.2*		
		-0.7%	*-11.2%*	*0.0%*		*43.71%*		*-49.1%*			*64%*	
RPI 5270km	**$22,023**				**$16,852**		**$20,435**				$8,506	**$1.61**
		-$3,740	na	-$1,432		$3,583		-$8,579	-$11,898	*-$30.2m*		
		-17.0%		*-6.5%*		*21%*		*-42.0%*	*-58.2%*		*39%*	

a Note that RPI removes contributions from the asset base before depreciation, whereas ARTC contributions are removed as a final carve out.

Key insights from the above analysis include:

- Arc's estimated DORC of $15,263m appears to be over-valued with their $m/track km rate of $2.90 which is greater than RPI's indicative estimate of $1.60 and the escalated ARTC estimate of $1.49.

- When comparing to GHD's 2019 estimate of the ARTC $m/tkm cost (adjusted for cost escalation of 23.8%), their estimated DORC of $10,249m amounts to $1.49/km (8,500km) which is relatively close to RPI's indicative rate of $1.60/tkm.
- The proportion of funding costs estimated by RPI is closer to the percentage of ORC estimated by GHD for ARTC in 2019 (i.e. RPI's estimate amounts to 21% of ORC less contributed assets, while Arc's estimate amounts to approximately 44% of ORC, while the comparable cost for ARTC was 17% of ARTC's ORC).
- The estimated depreciation rates are similar for all three estimates (i.e. circa 50%), before RPI applying acceleration to those route sections experiencing significant declines over the past 5 years. Note that Arc have not depreciated the funding costs, so we are not comparing like-for-like.

Stakeholder Submissions

RPI has considered the stakeholder feedback (6 submissions) and our review provides a detailed analysis of the key issues raised by each stakeholder sorted by topic to illustrate consistency across the submissions. We have dealt with stakeholder views by undertaking detailed analysis of various regulatory aspects associated with estimating DORC components, namely:

- The methodology for efficiently estimating funding costs
- The need to consider the range of impacts on the Railway Owner, current and potential access users and overall economic activity impacted by the usage of this infrastructure with recent trends in rail freight demand
- An assessment of contributed assets
- Allowance for cost escalation
- Comparisons with earlier ERA determinations (focusing on the 2013 Determination) and GHD's valuation of the ARTC's DORC as at July 2019 for the ACCC.

Where stakeholders claim inaccuracies with Arc's estimates, we provide greater transparency over the relevant differences between Arc's estimates and ours for each of the DORC components. In doing so and in evaluating these against relevant comparables analysis, we provide justification for some of Arc's assumptions and valuations, noting differences where relevant.

Recommendations

While our estimates for some of the major components of DORC are not too dissimilar to that put forward by Arc (after we accelerate depreciation for some routes), the method by which both Arc and RPI arrive at these component valuations differ. Our approach for estimating funding costs causes a material difference in the overall DORC valuation, and we also note that funding costs have not been depreciated by Arc, which is inconsistent with regulatory principles that users not be charged twice for the same cost. We have also recommended that selected routes have their straight line depreciation accelerated to address large and sustained declines in rail freight volumes. On this basis, we recommend that the ERA:

- not approve Arc's proposed DORC for the purposes of establishing the initial RAB for the network and
- not approve the depreciation schedule put forward by Arc in its current form.

Acronyms

ERA	Economic Regulation Authority
Arc	Arc Infrastructure
RPI	RPI
GHD	GHD Advisory
DORC	Depreciated Optimised Replacement Cost
GRV	Gross Replacement Value
RAB	Regulatory Asset Base
iRAB	Initial Regulatory Asset Base
CRC	Construction Replacement Cost
ROC	Railway Owner Costs
DCPM	Design Construct Project Management
ORC	Optimised Replacement Cost
MEA	Modern Equivalent Asset
SL	Straight Line Depreciation
GTK	Gross Tonne Kilometre
[redacted]	[redacted]
ARTC	Australian Rail Track Corporation
IDC	Interest During Construction (Funding Costs)
WACC	Weighted Average Cost of Capital
[redacted]	[redacted]
tkm	Track Kilometre
ASCI	Agricultural Supply Chain Improvements
[redacted]	[redacted]

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1 Introduction and Summary

The purpose of this report is to provide the Economic Regulation Authority [ERA] with a review of Arc Infrastructure's [Arc] Section 47J and 47K submissions (6 June 2025), considering the various stakeholder submissions. This initial report aims to verify the reasonableness, transparency and alignment of the valuation with regulatory, technical and economic principles reflected in the Railways (Access) Code 2000 (The Code) and amendments to the Railway (Access) Code (December 2023), as well as the revised costing principles by Arc submitted to the ERA (May 2024) and approved by the ERA following submissions by access holders and subsequent amendments (published November 2024). It highlights any observed misalignments or inconsistencies within the railway owner's submission, along with technical advice which the ERA can consider in its responses to issues raised by stakeholders and its approval decision.

1.1 Background

The decision to change the methodology for estimating the initial Regulatory Asset Base (iRAB) valuation from a Gross Replacement Value (GRV) to Depreciated Optimised Replacement Cost (DORC) requires Arc Infrastructure (Arc), as the railway owner, to put forward an iRAB valuation. This change brings the regulation of these railways into alignment with other jurisdictions and sectors, with DORC aimed at ensuring that:

i. the depreciation of each asset category better reflects the economic life of the assets
ii. the costs allowed for are prudent, efficient and reflect best practice
iii. that any unused or under-utilized assets are excluded from the asset base and
iv. any potential cost savings that may have resulted from technological improvement are considered.

The effect of such changes is that prices will more closely reflect the cost of replacing capacity or providing additional capacity.[2] This is important to meet the main object of the Railways (Access) Act 1998 which is to:

> *"establish a rail access regime that encourages the efficient use of and investment in railway facilities by facilitating a contestable market for rail operators."*

The change from GRV to DORC required an amendment to the Railway (Access) Code (December 2023) followed by a revision to the costing principles submitted by the railway owners (PTA and Arc) to the ERA (March 2024). Submissions regarding the Costing Principles were received from Co-Operative Bulk Handling Ltd (CBH), Aurizon and Pacific National who access these railways. Following a review process, the ERA approved the railway owners' costing principles with its amendments. Based on these costing principles, Arc is to value their iRAB for which they engaged GHD Advisory. They submitted their final report *Applicable Railway Infrastructure DORC* to the ERA 6 June 2025, after which stakeholder feedback was received August 2025.

1.2 Summary of review

RPI has undertaken an extensive bottom-up review of the direct job cost unit rates and quantities including relevant indirect job cost uplift factors to assess Arc's Construction Replacement Cost (CRC), the Railway Owner Costs (ROC), optimisation, funding costs and depreciation, along with adjustment for operating cost savings and contributed assets.

Table 1 lists Arc's estimated valuations and the alternative values put forward in this report. These alternative valuations are indicative only, as RPI's engagement was to provide a review of Arc's proposed Depreciation Optimised Replacement Cost (DORC), rather than a valuation of the DORC. [redacted] nor the condition assessment of the

[2] Note that both methodologies use a current cost approach on the basis that it will result in prices that more closely reflect the cost of replacing or providing additional capacity.

assets that have been valued for the purposes of estimating this iRAB.[3] Our alternative (indicative) values are based on our initial analysis of the information available at the time of this assessment.

Table 1 Comparison Arc DORC vs RPI DORC (Indicative) – by key components

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Acceleration of depreciation for routes experience significant declines in GTK (past 5 yrs)	$0.0m	-$3,319.8m	-$3,319.8m		
Opex adjustments	-$30.2m	-$30.2m	$0.0m	0.00%	RPI has not changed the opex adjustments
DORC	**$15,262.8m**	**$8,505.9m**	**-$6,756.8m**	**-44.27%**	**The change in DORC resulting from all of the above changes**

As a result of the revisions to some of the DORC components outlined below, RPI estimates the DORC to be $8,506m, a downward revision of $6,757m from Arc's DORC of $15,263m (a decline of 44%). Each of the DORC components is briefly described below.

Table 2 below presents our indicative DORC build-up by Network Group.

Table 2 DORC Build-up by Network Group (indicative values only)

Dorc Build-up by Network Grouup (RPI's indicative values only)													
Network Group	**CRC Total**	**Railway Owner Costs (excl interest)**	**Optimization**	**Contributed Assets**	**Funding Costs**	**Depreciation (% weighted by network group)**	**Depreciation x [ORC - Contr. Assets]**	**Effective acceleration factor**	**Depreciation with Acceleration**	**OPEX savings**	**DORC excl. Accelerated Depreciation**	**DORC**	**Percentage**
CBH Sidings	$305m	$59m	$3m	$11m	$71m	36.60%	$154m	1.00	$154m	$1m	$266m	$266m	3%
SWM	$1,211m	$234m	$239m	$27m	$236m	48.58%	$687m	1.42	$980m	$2m	$726m	$434m	5%
Central	$1,947m	$376m	$20m	$92m	$451m	36.62%	$975m	1.00	$975m	$4m	$1,684m	$1,649m	19%
EGR	$3,755m	$725m	$38m	$226m	$870m	47.35%	$2,408m	1.14	$2,754m	$7m	$2,670m	$2,318m	27%
GSR	$1,410m	$272m	$14m	$99m	$327m	37.46%	$710m	1.32	$934m	$3m	$1,183m	$933m	11%
Non-Operational	$2,811m	$543m	$3,354m	$0m	$0m	0.00%	$0m	na	$0m	$0m	$0m	$0m	0%
Collie	$234m	$45m	$2m	$9m	$54m	36.51%	$117m	1.27	$149m	$0m	$204m	$172m	2%
Metro	$564m	$109m	$6m	$5m	$131m	46.93%	$372m	1.32	$491m	$1m	$420m	$299m	4%
Sidings & Other	$170m	$33m	$2m	$4m	$39m	41.41%	$98m	1.21	$119m	$0m	$138m	$118m	1%
MR	$1,719m	$332m	$18m	$98m	$398m	37.96%	$886m	1.69	$1,501m	$3m	$1,445m	$814m	10%
EBL	$1,797m	$347m	$18m	$112m	$417m	46.87%	$1,139m	2.00	$2,276m	$4m	$1,288m	$151m	2%
LBL	$774m	$149m	$8m	$11m	$179m	37.38%	$405m	1.50	$610m	$2m	$678m	$473m	6%
Lakes	$774m	$149m	$8m	$37m	$179m	36.83%	$390m	1.00	$390m	$2m	$667m	$655m	8%
Midwest	$989m	$191m	$10m	$704m	$229m	33.90%	$236m	2.00	$471m	$2m	$458m	$222m	3%
TOTAL	**$18,461m**	**$3,563m**	**$3,740m**	**$1,432m**	**$3,583m**	**41.98%**	**$8,579m**		**$11,804m**	**$30m**	**$11,826m**	**$8,506m**	**100%**

High-level insights from this DORC build-up by network group include:

- EGR and Central networks account for approximately one half of the total DORC (27% and 19% respectively)
- GSR and MR account for a further 21%, so combined these four networks account for approximately two thirds of Arc's proposed DORC valuation.
- Approximately 17% of the network replacement costs (CRC+ROC) has been optimised
- Approximately 7% of the network replacement costs (CRC+ROC) are contributed assets
- Funding costs allowed for the construction and commissioning period amount to approximately 16% of the network replacement cost (CRC+ROC) and 21% of the ORC.
- Approximately 42% of the network has been depreciated, and approximately 52% of this total depreciation is accounted for by the four networks (EGR, Central, GSR and MR) which account for approximately 67% of the total DORC.

1.3 Scope and purpose of review

Arc's submission estimates their iRAB valuation using the Depreciated Optimized Replacement Cost (DORC) for the proposed routes set out in Appendix 1 of the respective Costing Principles (November 2024). These include those routes and route sections defined as "applicable railway infrastructure" and "applicable route section" in section 47C(b) and 47N(2) of the Railways (Access) Code 2023. The purpose for undertaking this valuation is to provide the ERA with relevant cost information to determine the relevant cost information for access on applicable routes under the code.

1.3.1 Requirements of Review

The Scope of Works for this review requires RPI to assess whether the input costs submitted by Arc are substantiated as being reasonable and efficient in terms of the provision of railway infrastructure, with any contentious issues or potentially erroneous or missing information to be identified.

RPI is to assess Arc's input cost parameters including all asset categories listed in the Costing Principles (under Standard Design Life), which must include:

(1) construction costs - earthworks, tracklaying and culverts/bridges
(2) track supply costs – ballast, sleepers and fasteners
(3) communications and signalling.

RPI is to assess costings for these three categories, which should include:

- source costs
- transport costs and
- working capital costs

Costs need to be calculated to a reasonable construction timetable.

RPI is to assess whether:

- Arc's MEA assumptions are reasonable
- The input costs are reasonable and efficient in terms of the provision and management of the specific railway infrastructure, considering all relevant information including comparisons where appropriate with infrastructure assets of a similar nature in Australia and relevant overseas countries.

RPI has considered all stakeholder submissions and has included analysis to address stakeholder concerns. This included either adopting an approach which avoids a potential problem or providing comparables analysis to justify or otherwise the relevant costs.

Where RPI finds that the costs submitted in Arc's proposal do not meet the above criteria, the reasoning for concluding this and an alternative costing for that item is required.

1.3.2 Information sources and limitations

RPI has based its analysis of Arc's DORC on their June 2025 report *Applicable Railway Infrastructure DORC* to the ERA 6 June 2025 and accompanying excel model built by GHD Advisory. We also received stakeholder submissions (6). RPI put forward questions to the ERA for clarification from Arc, with these both checking accuracy of calculations and methodological issues, in addition to asking for more detailed information around route sections and formulas used in their modelling. Arc has responded to three requests, 11 July 2025, 16 July 2025 and 23 July 2025. RPI received the excel files containing the required detail to support GHD's valuation in August 2025. We note that the ERA issued Arc with a Section 21 mandatory information request under the Railways (Access) Act 1998. While we were provided with sufficiently detailed GTK data, [redacted] and GTK data from 2015 to 2024 under a s21 request.

Any alternative costing put forward in this report has been undertaken without access to or verification of the assets included in Arc's modelling and must therefore be treated as an indicative difference in value, rather than a final DORC valuation in the typical regulatory sense. RPI understands that we will receive feedback from the ERA and stakeholders on our analysis and will respond to these in due course before submitting our final report.

1.3.3 Valuation Date

Railway owners were required to submit their valuations by June 2025, with the relevant valuation date being 31 December 2024.

1.4 Regulatory context and legislative framework

The 2020 Review of the Western Australian Rail Access Regime identified strengths and weaknesses in the rail access regime following submissions on an Issues Paper in 2017 and a Draft Decision Paper in 2018. In addition to the circulation of these, workshops and meetings with stakeholders, there was close liaison with the Department of Transport, Department of Jobs, Tourism, Science and Innovation and the ERA and consultation with industry stakeholders. One of the issues raised was:

> *"Inefficient pricing guidance for negotiations: the asset valuation methodology and the resulting floor and ceiling do not necessarily ensure that railway owners cover their incremental costs or prevent them from earning monopoly profits. These unrealistic price limits hinder the efficacy of negotiations."*

Table 3 lists two of the 18 recommendations are pertinent to this review:

Table 3 – Recommendations from the WA Rail Access Regime Review 2020

Issue	Recommendation Summary	
Pricing Mechanisms	1A	Change the asset valuation method to depreciate optimised replacement cost (DORC) and align the floor and ceiling cost calculations to a building block method with an initial DORC valuation.
	1B	Introduce a trigger to determine when railway owners will have to comply with the main regulatory obligations associated with the DORC method.
	1C	Allow for flexibility in the assessment of historical depreciation to manage transitional impacts on existing railway owners, for a maximum of five years.
	2	Require railway owners to publish a standing offer for defined rail tasks when required by the ERA.
Regular Accountability	14	Provide more upfront direction to the ERA and require the ERA to obtain two expert reports for the initial decision on the regulatory asset value if the first expert report differs significantly to the railway owner's proposal.

Critical issues identified in the Review of the *Railways (Access) Code 2000* (2015) included:

- the limitations in relying upon a depreciated value to reflect the condition of an asset (or the standard of service) with it possible that routes with a written down asset value of zero could still retain some economic value to users
- the effect of information asymmetry in pricing negotiations and the possibility that the quality of asset conditions can be overstated, resulting in an ex-post change in service quality
- the differing impact of changing to a DORC depending on the route (e.g. Tier 3 routes under Schedule 1 of the Code which have been closed or are not currently in use) and the prevailing standard of the track (i.e. less impact for routes of higher standards)

At a national level, the review of the National Rail Access Regime[4] highlighted problems associated with multiple, fragmented state systems that work against interoperability and efficiency. They propose short-, medium- and long-term reforms aimed at increasing consistency and aligning access regimes for better national integration

WA Government's Grain Freight Supply Chain Strategy and ASCI Program are aimed at supporting long-term grain export policy, regional freight efficiency goals, and national supply chain integration.[5] In April 2025, Prime Minister Anthony Albanese offered federal backing, including $2.5 million in funding for a joint feasibility study with the Australian Rail Track Corporation (ARTC). The study aims to assess the potential integration of WA's rail network with the national rail system, particularly the east–west line from Fremantle to Kalgoorlie.

1.5 Structure of the report

This report is structured as follows:

- Components and build-up of the DORC with clarity around definitions (for both estimating and comparing costs) across time and jurisdictions
- Review of Arc's Construction Replacement Cost (CRC)
- Review of Arc's Railway Owner's Costs (ROC)
- Review of Arc's Interest During Construction Costs (IDC)
- Review of optimised assets
- Estimation of contributed assets
- Review of Depreciation
- Review of adjustments to operating costs
- Comparables analysis
- Stakeholder feedback and responses on issues raised (6 stakeholder submissions received)
- Recommended changes to Arc's estimated DORC

Each of the review sections above sets out the specific guidelines or requirements of the Costing Principles and relevant legislation and outlines Arc's submitted cost estimate for that component of the DORC. It provides a review of the methodology used by Arc and the estimated costs. Following our separate assessments of each component, a detailed analysis of comparables is provided with the combined aim of validating RPI's alternative (indicative) cost estimates (or otherwise) and approach. Finally, we address the many issues raised by stakeholders with a brief explanation of how

4 PwC, Review of rail access regimes, Dept of Infrastructure, Regional Development and Cities, May 2018.

5 Since 2019, WA and the Commonwealth have co-invested $200M+ in ASCI, upgrading roads, intermodal terminals, and some Tier 1 and 2 rail lines. However, rail access remains a barrier: CBH and growers argue that rail access remains a barrier, with Arc's lease terms discouraging long-term rail investment and driving more grain onto trucks, worsening road safety and costs. In August 2022, the WA Government released its Grain Freight Supply Chain Strategy to improve efficiency, reduce bottlenecks, and prepare for projected grain harvest growth, with CBH forecasts suggesting an average of 25–30 Mt by the 2030s, up from 20 Mt.

RPI's review has dealt with each of them, noting where additional supporting information was or may still be required or additional time required to address issues more fully.

2 Methodology Overview

This section sets out RPI's scope of works, the relevant regulatory and economic principles that underpin this scope of works, the various stakeholders and issues of relevance to them. It then briefly describes the valuation methodology for the iRAB and on-going roll-forwards of the RAB, along with the terminology used for the various cost components that comprise the DORC. It is important to ensure that in comparing values with previous determinations for regulatory pricing purposes, that values are adjusted as appropriate to ensure the comparison is strictly like-for-like.

2.1 Review approach

Figure **1** illustrates our methodology which encompasses the tasks outlined in the scope of works:

Element 1 – Assess the proposed depreciation schedule for all asset classes
Element 2 – Assess Initial Regulatory Asset Base for each route.

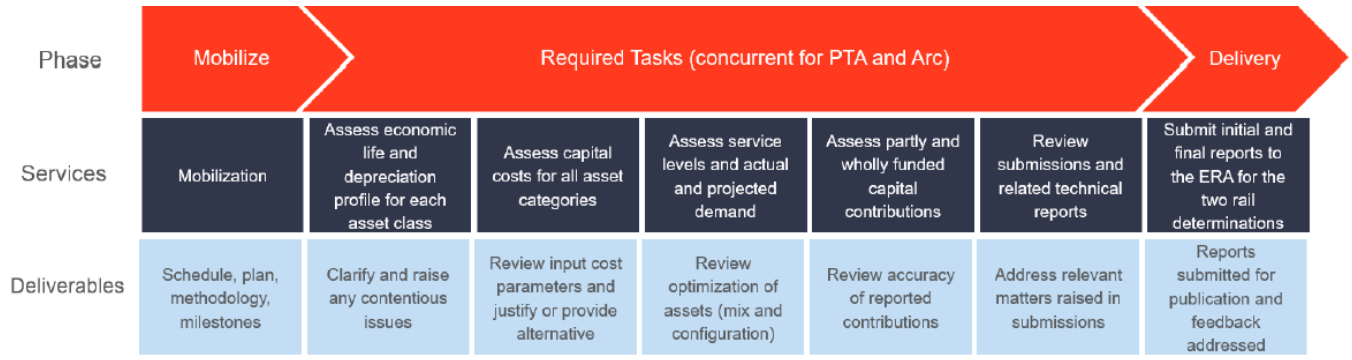

Figure 1 Methodology in scope of works

These services will be delivered within the relevant sections of our report which as noted in section 1.5 is structured along the lines of the key components of the DORC.

2.1.1 Application of Regulatory and Economic Principles

Full cost recovery is an established pricing principle aimed at ensuring that investment in infrastructure is adequate to maintain or grow services as required. Along with principles of consumption-based pricing with cost recovery from users, an efficient cost reflects the minimum costs necessary to provide the activity while achieving the policy outcomes and legislative functions of the Government.

Operationalising these pricing principles requires:

(i) transparency and accountability,
(ii) effectiveness and efficiency and
(iii) stakeholder engagement.

The IRAB and the pricing decisions based on it will need to make clear how risks and uncertainties around demand and volumes, costs, service levels and pricing are to be treated. Changing to DORC can lead to financial, operational and regulatory challenges with DORC often resulting in a lower RAB value. Overarching considerations for the ERA include

the legitimate business interests of the railway owner, as well as the interests of access holders and access seekers, ensuring financial stability and consumer interests are both considered as they transition.

The Code and the Costing Principles for the Arc Infrastructure as the railway owner (based on the code) sets out in detail the criteria for assessing efficient costs and the cost allocators (i.e. cost drivers) to be considered by the Railway Owner for the various routes managed by them. Relevant issues to consider are identified in each review section of our report.

RPI explains the rationale for our conclusions on the basis of regulatory and pricing principles relevant to application of the Costing Principles and the Code along with technical opinion based on both the engineering costs associated with relevant assets and the different treatments required for financial valuations where relevant (e.g. estimation of funding costs).

2.2 Stakeholder engagement

Stakeholder engagement is important for both transparency and accountability. RPI has identified the relevant issues raise by stakeholders and responded accordingly. We note that stakeholders identified the following key critical issues in their 2024 submissions regarding the Costing Principles, some of which are listed below as they provide a useful context for our review:

- Prices must reflect the standard of infrastructure accessible to users (payload, tonne axel load, mix of rail gauges, sleeper types), noting the impact on users' costs
- Transparency around how replacement costs are estimated and assumptions applied
- Demonstration of prudency and efficiency to ensure lowest current costs are used with supporting evidence (including assumed project durations and construction cost profiles)
- Accuracy of records for contributed assets
- Accuracy of demand forecasts for estimating growth and the degree to which assets are optimized
- Service levels used to optimize assets correctly account for redundant assets and the need to ensure that the level of design is appropriate, along with decisions around greenfield and brownfield construction
- Clarity around how the physical condition of assets is assessed, the forecast rates of asset consumption and differences in performance relative to design life (i.e. ensure asset consumption reflects economic life of the asset)
- The need for certainty for access seekers (e.g. by limiting changes to significant changes in market conditions or material changes in circumstances that impact on the expected use or stranding risk of a route).

2.2.1 Submissions received

The ERA has received submissions from the following stakeholders:

- Association of Mining and Exploration Companies [AMEC] representing over 600 member companies across Australia, with over half invested in Western Australia
- Aurizon, Australia's largest rail operator with its operations extending across both Arc's rail network in WA and more generally across Australia, including the large-scale bulk haulage of iron-ore and coal , integrated supply chains for other bulk products and the recent introduction of interstate containerised freight services.
- CBH Group [CBH], Australia's largest co-operative, owned and controlled by around 3,500 Western Australia grain growers, operating a bulk handling supply chain for accumulating, transporting and exporting grain and utilising around 70% of Arc's freight rail network.
- Karara Mining Limited [KML] which owns and operates the Karara Project, Western Australia's largest mining operation and the first magnetite mine in Australia's Mid-West region, with the project beginning as a joint venture between Ansteel Group Corporation Limited and Gindalbie Metals Limited in 2007.
- Pacific National (PN), the dominant operator of intermodal freight between the eastern states and Perth, relying on the freight network to connect to the Forrestfield (intermodal terminal) and links to Fremantle Port, and as such is critically dependent on Arc Infrastructure's Eastern Goldfields Railway.

- Chamber of Commerce and Industry WA [CCIWA], the peak body representing more than 7,000 members with the purpose of advancing trade and commerce in Western Australia.

2.2.2 Stakeholder issues identified

The following issues were identified across the stakeholder submissions, with consistency in the positions put forward and relatively extensive commentary on certain issues. For each issue, RPI succinctly summarises the various submission and then provides commentary based on the requirements specified in the Code and Costing Principles and our understanding of the application and implications of these for stakeholders and the broader economy.

- Excessive DORC Valuation
- Lack of transparency and/or supporting information
- Lack of comparables analysis
- MEA specification and estimation of replacement costs
- Asset specification and estimation of replacement costs
- Mark-ups
- Railway Owner costs
- Procurement cost savings
- Excluded Assets
- Contributed Assets
- Level of Service and Demand
- Optimisation
- Depreciation
- Location Adjustments
- Funding Costs
- Operating Cost Adjustments
- Cost escalation and inflation
- WACC and its impact on the iRAB and subsequent revenues/pricing
- Other –
    - Asset identification
    - Robustness of the valuation
    - Calculation errors
    - Accuracy level of the cost estimates

2.3 Valuation Methodology and Regulatory Precedents

The estimation of the iRAB sets the "line in the sand" for cost recovery, with the RAB roll-forwards determining the rate at which costs will be recovered over time. To meet the regulatory and pricing principles, it is important that users are not charged for assets they do not use. However, it is also important to ensure that the railway owner earns a sufficient return to ensure that an efficient level of infrastructure capacity is delivered. Our report is limited to reviewing the iRAB (DORC) submitted by Arc based on a review of the replacement costs of the railway assets. This entails allowing for optimisation of the base, deducting contributed assets to avoid double-recovery and making allowances for operating expenditure where decisions around optimisation or MEA's adopted impact on these, so that the lowest whole-of-life cost is achieved. As such, the valuation of the DORC is for regulatory purposes, not business purposes, with both following different processes and having different outcomes.

An important component of the DORC is the funding costs. This entails estimating the value of the funding costs associated with construction and commissioning of assets over an assumed capital expenditure profile. This aspect requires a different valuation approach to that used for estimating the replacement construction costs (with the latter based on first principles unit costs and quantities and required on-costs. Failure to adhere to accepted financial principles and regulatory pricing principles making assumptions that more closely reflect construction and commissioning time frames can result in estimates of this component that are excessive for their intended purpose.

Finally, there is a subjective element to the assessment of depreciation, with it necessary to consider the recent trends in rail freight volumes across different route sections to understand both the possible causes of these trends as well as the implications for the Railway Owner (who must earn an appropriate return on the infrastructure and provide a certain level of service), as well as implications for access holders and potential access users. The interplay between these competing considerations has significant implications for interrelated infrastructure such as intermodal terminals and ports, which can be a pivotal aspect of activity within certain regions and the economy more broadly. RPI proposes accelerating depreciation for those routes experiencing significant decline in freight during the past five years, viewed against a background of 10-year historical demand and reasonable forecasts of freight demand for the next decade. This will have potential benefits for promoting greater contestability within the freight sector, with flow-on benefits for stakeholders and ultimately the economy.

2.4 Terminology for cost components

Table 4 below sets out the terminology used for the different components of costs that comprise the construction replacement cost (CRC). The estimation of this component is central to the overall DORC valuation, as it underpins the estimation of Railway Owner's Cost and depreciation. The CRC comprises two elements, composed of the construction costs experienced by a typical contractor to undertake the construction works and the ROCs for their activities undertaken across the construction process.

The Construction Replacement Costs (CRC) comprise the Contractor's Direct Costs and the Contractors Indirect Costs (or on-costs), noting that indirect on-costs are applied cumulatively to the direct job costs in accordance with industry best practice.

The ROCs have been added as a separate line item and together with the CRC comprise the Total Replacement Cost (or Project Cost). The table below highlights what costs are included within each category:[6]

Table 4 Terminology for Cost Components

Construction Costs	Arc's Submission and RPI's review
Contractors Direct Costs This captures the cost of labour, plant, materials and specialist subcontractor requirements that are required to deliver the works	***MEA Unit Costs and quantities, which include:*** Uses typical unit construction rates presented as the sum of the contractor's rates and assumptions on dimensions based on modern equivalent considerations, therefore meeting standards set by appropriate industry guidance.[7]
Indirect Costs This captures the cost of items such as contractors' management, site supervision, insurances, site accommodation, and temporary services that are required to deliver the works	***Contractors Indirect Costs*** The following adjustment factors are included in the unit rates adopted by Arc: • Contractor risk premium (5% of direct costs; included in contractors' tender pricing) • Contractors' preliminaries (30% of direct costs, however this has been reduced by RPI to 25% based on benchmarking data from across the infrastructure sector and reduced to 10% for signalling and communications assets, given the unit rates already include specialist subcontractor markups within the unit rates) • Contractors' Overheads and profit (9.5% of direct costs) • Location adjustment factors based on geographic regions (with factors higher the further away the construction is from urban centres and applied to labour, plant and material costs)

6 These descriptions are taken from Genus Advisory's April 2025 report to IPART which provides advice on the updating of IPART's cost benchmarks for local infrastructure items (p10).

7 Guidance Note 2 – Base Cost Estimation, Department of Infrastructure, Transport, Regional Development, Communication and the Arts, Australian Government, Version 2, November 2023.

Indirect Costs	***Railway Owner's Indirect Costs*** This captures the cost of the Railway Owner and will include costs associated directly with development and delivery of the works together with the cost of operating the business which is typically allocated across a number of projects for items such as main office rental expenses, and core business costs such as accounting, tendering, and legal expenses. Note – RPI applied the 19.3% ROC allowance to the estimated CRC and removed both components for non-operational routes during the optimisation step. Arc's proposal includes for the following adjustment to the overall construction cost to allow for Railway Owner costs included at a rate of 19.3% on the overall construction costs, comprising: • Planning and design costs (4.0% of ORC) • Planning and development costs (1.2% of ORC) • Project and construction management costs (11.2% of ORC comprising:) - Project management supply (1.4% of ORC) - Project management install (2.9% of ORC) - Construction management (6.9% of ORC) • Corporate and other costs (3.0% of ORC)

Arc's proposal notes that their costs are based on recently tendered similar works in WA with adjustments to account for any changed circumstances as at the valuation date (31 December 2024). Section 4.4 of the report states that uplifts for overheads and profits, contractor preliminaries and risk premia in the unit rates are compounded (i.e. successively applied to cost estimates), however, analysis of the model provided by GHD shows these to be applied to the same base cost and added.

2.5 Comparable analysis

In reviewing and comparing costs, it is important to note that the percentage uplifts being applied to the direct cost unit rates will vary based on the sector, size, complexity and stage of projects. This analysis considers comparable projects based on what other regulators have used within the rail sector, in particular GHD Advisory's 2021 estimation of the DORC valuation for ARTC as at July 2019, as well as earlier access price determinations for relevant route sections in the past by the ERA. Indirect or Railway Owner costs are also integrated into total cost assessments used for pricing and regulatory purposes, and again, these have been applied individually based on the CRC estimates.[8]

In comparing cost, it is also important to recognise differences in approach based on regulatory requirements. Such differences include the use of greenfield vs brownfield developments. In accordance with the most recent Costing Principles, Arc has estimated the least-cost based on delivery being undertaken by an experienced and responsible, competitive industry service provider using the most efficient means in a brownfield environment. To achieve this, rates and prices were independently established having regard to the unique characteristic of Arc's vast and geographically spread rail network. RPI has adopted unit rates for the identified works based on the works being undertaken at a location within reasonable distance to the supply of labour and materials. Where the intended worksite is remote from the standard location, an adjustment factor is added to compensate for the additional costs incurred due to the remote

8 IPART published benchmarks for various types of costs in the rail sector, but these generally relate to direct and fixed costs of rail infrastructure.

location. Rates are then benchmarked (where appropriate) against previous and current projects to ensure rates are appropriate.

Section 2.6 of the Costing Principles state:

> *"The asset replacement cost will represent the cost of developing and constructing an asset on a brownfields basis, with the following considerations:*
>
> - *cutting and embankments are not included in estimating the initial DORC, although expenditure since the commencement of the Code to create capacity, or expand the network, or improve standards or efficiency, are included;*
> - *the new infrastructure is constructed without existing traffic on the rail; and*
> - *planning and development costs are included to the extent that they are required to integrate with existing infrastructure."*

The likely impact of constraints associated with brownfield and greenfield development costs are set out in Genus Advisory's April 2025 report to IPART. Table 5 and Table 6 set out these various cost factors.

Table 5 Cost factors for Brownfield (infill) works

Likely Impact of Constraint	Description	Cost Factor Range
High	Highly constrained area with heavy traffic, high impact to existing utilities, reduced site access, working outside of normal working hours, and significant reinstatement of the existing and any adjacent infrastructure.	26% to 40%
Medium	Moderately constrained area with medium traffic levels, moderate impact to existing utilities, some requirements for out of hours working, and some reinstatement of the existing and any adjacent infrastructure.	15% to 25%
Low	Minimally constrained area with low traffic levels, minimal impact to utilities, working during normal hours, and minimal reinstatement of the existing and any adjacent infrastructure.	0%

Table 6 Cost factors for Greenfield works

Likely Impact of Constraint	Description	Cost Factor Range
High	Impact to an area with significant environmental, archaeological and heritage importance, high impact of planning approval process, and minimal availability of existing utilities and services at site boundary.	11% to 15%
Medium	Impact to an area with moderate environmental, archaeological and heritage importance, moderate impact of planning approval process, and moderate availability of existing utilities and services at site boundary.	5% to 10%
Low	Impact to an area with low environmental, archaeological and heritage importance, low impact of planning approval process, and high availability of existing utilities and services at site boundary.	0%

2.5.1 Location factors

To allow for the impact of location proximity on construction costs, some organisations refer to The Rawlinson's Australian Construction Handbook as a guide to establish the additional costs incurred when delivering infrastructure works in regional areas when compared to the metropolitan areas. The Rawlinson's regional indices consider the cost differences that likely arise due to works occurring in areas outside major urban centres. However, Rawlinson's price book is predominantly focused on traditional building construction works and as such the application of those location factors is not recommended for rail infrastructure works.

It is also noted that the source location of materials, the location of contractors' depots and the availability of local resources, accommodation availability, construction demand within the locality, can also have a major impact on the Locality Loading. The review that has been undertaken acknowledges that a locality loading is required to compensate for the increased costs that projects experience the further that project is located away from suppliers and resources.

Without a detailed assessment of each location, the actual location of different material suppliers, and the availability of appropriate resources, plant and accommodation required to deliver the works, an accurate assessment is difficult to ascertain. However, noting that there are five different locality factors included within the assessment, these appear to be reasonable given the geographical spread of the rail networks across WA. The location factors are incorporated in the unit rates and have therefore been applied to construction costs. RPI has reviewed the locations factors used and consider them to be reasonable based on witnessed markup and locality factors applied to other regional and remote infrastructure projects.

Genus Advisory note that while certain types of work in regional locations may cost more or less than work in urban areas, work in remote areas is likely to cost more than either regional or urban areas. They note that it is important not to double-count the additional costs for transporting raw materials from the material source with those allowed for in the regional indices. This is checked by ensuring the unit rates are reasonable for delivery to a standard worksite as discussed in s2.5.

2.5.2 Accuracy levels of cost estimates

Arc's submission states that their DORC assessment most closely aligns to an AACE Class 5 estimate with an accuracy in the range of -20% to -30% on the low side to +30% to +50% on the high side. RPI does not believe this classification applies to the DORC assessment provided by GHD based on the purpose of the assessment and methodology used which is regulatory engineering and economic valuation, not project delivery costing. That is, AACE accuracy classes are relevant for real project delivery estimates, not regulatory replacement cost models. They include contingencies and scope maturity risk, which are irrelevant to an "efficient, optimised" cost benchmark.

2.5.3 Scope of assets included

There must be sufficient asset coverage and granularity to ensure all relevant asset categories are covered, with an appropriate level of disaggregation used in modelling (e.g. by route segment).

Table 7 lists the asset categories used by Arc, with these further broken down into sub-categories.

Table 7 Asset Categories

Asset Categories	
Right-of-way	Land Formation Cutting and embankments Clearing and grubbing Access Roads
Civil Structures	Bridges Tunnels Culverts
Associated Track Structures	Pedestrian level crossings
Track	Rail Sleepers Ballast Turnouts
Signalling and Control Systems	Signalling Communication Systems
Buildings	Control Centres Depots Maintenance facilities
Miscellaneous	Plant, machinery and equipment Walkways Signage Platforms

It appears that all relevant asset categories are covered with an appropriate level of disaggregation used in modelling (e.g., by route segment) following Arc's response to additional information requests by RPI, noting that Arc's proposal submitted 218 route sections, slightly fewer than the 221 route sections specified in Appendix 1 of the Costing Principles. However, we note that Arc's routes do differ from the 221 route sections specified in the Costing Principles. All major asset classes have been explicitly valued, with chainage or route-level data used where appropriate. All indirect and enabling assets appear to have been included (e.g. maintenance depots).

2.5.4 Excluded assets

Under the WA Rail Access Code, only assets that Arc has funded and that are on the Schedule 1 routes are automatically eligible for inclusion in the RAB. Assets that benefit a single access holder or are built specifically for them are often funded by the user, are excluded from the RAB to avoid double recovery.

The type of asset can also influence whether it is included in the RAB. For example, a spur must be part of a route listed in Schedule 1 of the Code. The spur must be available for use or intended use by third parties (i.e. an access seeker). If it only serves a private purpose (e.g. an exclusive mine spur with no third-party use), it may be excluded. The expenditure must also meet the definition of "Railway Infrastructure", which under the Code and the Railways (Access) Act 1998, includes track, signals, sidings, and other fixed assets used in train operations. Finally, it must be capitalised and owned by the Arc (i.e. capitalised on the books of the railway owner, not merely leased or privately owned by a customer. If it was constructed and funded by a third party and not transferred to Arc, it may not be included. Inclusions must also be consistent with Arc's Costing Principles in terms of treatment of assets with shared or limited use.

Section 2.3 of the Costing Principles states that:

- Costs of cuttings and embankments made prior to the commencement of the Code will not be included in the asset replacement cost used in the Initial RAB.
- The asset replacement cost will include amortised amounts of the costs of acquiring any interest in or access to land incurred after the commencement of the Code.

Arc's proposal has taken these two considerations into account for the relevant assets (with only a small number of cuttings and embankments included in the Midwest Network Group).

The Department of Main Roads provided the following clarifications to the ERA around costs associated with level crossings:[9]

- Motor level crossings fall under the PTA, rather than Arc's network
- Pedestrian crossings fall under Arc's network (there are 203 pedestrian crossings inclusive of private access facilities, 40 of which are located on non-operational rail lines.
- There are also no 'unprotected' pedestrian crossings located on operational rail lines.
- Arc do not have ownership of the pedestrian crossing controls.
- *"Funds for public railway crossing control are provided by the State Government. All costs associated with controlling crossings not located on public roads are to be met as agreed between to Road Manager and the Rail Infrastructure Manager. …Installation and maintenance of pedestrian crossings is undertaken by Arc at the cost of the relevant road or path manager."*[10]

Arc has not included motor vehicle crossings as these are not owned by Arc. RPI has examined the number and value of pedestrian crossings and believe it aligns with the points above.

2.5.5 Allocation of costs

Arc have allocated costs in instances where either an asset provides services across multiple route sections, or a route section receives services from multiple assets within the same asset group (e.g. Radio masts). RPI only considers Alternative A signalling and communication assets under ERA instruction to do so.[11]

- Centralised control centres providing services to multiple route sections have costs allocated based on route km within each route section (only for routes which have signalling included)
- Maintenance facilities providing services to multiple route sections have costs allocated based on route km within each route section.
- Radio masts were assigned to the nearest route section, and the cost was then allocated to that section.
- Situations where one route section received services from multiple radio masts was dealt with by summing the total proportion of all radio masts servicing each route section. (114 radio masts were allocated across the entire Network).
- Funding costs were allocated in proportion to the ORC, in line with regulatory precedence.
- Contributed assets are mostly allocated to the relevant route sections where these are known, and otherwise by weighted ORC values.[12]

3 Review of Construction Replacement Costs and Railway Owner Costs

This section reviews the three key elements of the Construction Replacement Cost estimate:

- The MEA's used for unit root costings
- The quantities adopted and uplift factors
- The Railway Owner Costs (indirect costs)

This estimate is pivotal to the overall DORC value as it determines the other key components of the DORC valuation which then is depreciated.

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9 Email communication between Main Roads Western Australia and ERA, 28 August 2025.

10 This is an excerpt from the Railway Crossing Control in Western Australia Policy & Guidelines.

11 Note that Passing Loops and Junctions required allocation of costs under Alternative B and this was done based on the number and total length of loops within each route section. Where a loop or junction was within more than one route section, it was allocated in equal proportion.

12 GHD Advisory, Developing a Regulatory Asset Base for the Australian Rail Track Corporation Interstate Network, using the Depreciated Optimized Replacement cost method. Concluding Public Report". See s7.3 which states "…the allocation of IDC to segment in proportion to ORC, which is appropriate because to do otherwise would pre-suppose a construction sequence."

3.1 Review of MEAs

Section 2.3 of the Costing Principles states:

> *"The asset replacement cost used in the Initial RAB will be the lowest current cost to replace the Railway Infrastructure based on Modern Equivalent Assets (MEAs). MEAs comprise the assets and form of construction which would be designed and constructed at the valuation date, using modern design techniques, constructed from modern materials using modern methods, and in compliance with prevailing legislation and prevailing standards. The MEA scope will be defined on the basis that it meets the closest comparable service standard to the existing asset."*

Arc's submission of the DORC follows regulatory principles and precedent and is based on efficient replacement costs for Modern Equivalent assets in an optimised configuration, where the MEA:

1. meets the closest comparable service standard to the existing
2. comprises the assets and form of construction which would be designed and constructed at the valuation date, using modern design techniques, constructed from modern materials using modern methods, and in compliance with prevailing legislation and prevailing standards.

Arc's proposal notes that the appropriate MEA is specified having regard to:[13]

- the required operating standards (axle load, maximum speed, maximum train length);
- the population of supporting infrastructure (bridges, culverts); and
- the topography of route (gradient and track curvature).

MEAs therefore use modern design techniques, are constructed from modern materials using modern methods, and in compliance with prevailing legislation at the valuation date.

MEAs have been selected which:

- Use proven technologies. New or unproven technologies or methods are not used as this could reduce the viability of the MEA being able to provide the level of service of the existing assets and increase project risk;
- Align with how the asset would be constructed today, given modern technology and construction methods, including prevalence of use of that item in industry (e.g. commercially available assets);
- Are appropriate for the level of foreseeable demand on each route section.

The direct replacement costs seek to reflect the current cost of replacing the existing assets with MEAs and reflect the cost of assets constructed by a competitive industry service provider using the most efficient means in a brownfield environment. Note that the replacement cost is based on the MEA, which may not be the same form of construction as the existing asset.

Arc has provided the set of assumptions adopted for estimating the DORC on an MEA basis for all route (sections). These are to include assumptions on:

- rail weight
- ballast depth
- sleeper types (and spacing)
- fastener type
- signalling type
- passing loop lengths
- network construction rates
- turnouts and
- formation costs.

[13] Costing Principles, Arc Infrastructure, 30 May 2024, Section 2.4

Arc's costing principles outline that it considers that the majority of the existing track configuration (that is, sleeper type, rail weight etc) can be adopted as the MEA. RPI has reviewed the MEA assumptions in relation to the construction replacement costs and consider across all the asset types except sleepers and signalling and communication replacement costs, that these assumptions are valid & representative of current industry practice. RPI have adopted concrete sleepers as MEA, rather than a mix of concrete, steel and timber sleepers.

For signalling and communication replacement costs, we have put forward an alternative high-level indicative estimate based on typical benchmarked unit rates per track kilometre (tkm). The cost assessment has been split into the following key areas of fibre optic cabling, signalling, communications and radio masts. The primary assumption is that these are specialist works that would be performed by specialist signalling and communications subcontractors. The benchmarked unit rates have then been applied to the Arc's quantities. Uplifts for locality adjustment, and main contractor's overheads and margin have then been added onto the resulting costs.

Generally, RPI have adopted the quantum of assets as advised by the Arc submission. No check has been undertaken to validate the quantities provided.

3.2 Review of Direct Costs (including uplift factors)

RPI has undertaken an extensive bottom-up review of the unit rates (including relevant uplift factors) to assess Arc's CRC, [redacted]

Each of the specific asset classes were reviewed at a unit rate level to provide a comparable and relevant construction replacement cost valuation associated with each. Based on the 20 separate asset classes provided within the Arc assessment (19 excluding platforms which did not have a value), RPI have provided an alternative (indicative) value where deemed appropriate, while in certain cases where the valuation provided by Arc was considered reasonable, this value has been adopted. In total the following adjustments were made:

- Valuation Decreased across 3 Elements
- Valuation Increased across 7 Elements and
- Arc Valuation retained across the remaining 9 Elements.

3.2.1 Basis for calculating asset construction costs

In preparing unit rates for the purpose of developing comparative (indicative) costs, it is important to recognise differences in assumptions and site-specific issues that may have an influence on an individual unit rate that is unique to a non-typical location. As such the adopted unit rates are for the direct job costs (DJC) and can only be considered as being representative of the intended works associated with work activity or element under consideration. It is accepted that there will be differences in the unit rates adopted for this review, however the unit rates are typical for the element of work and have been developed from first principles estimating and supported by benchmarking against commercial tenders and outturn values witnessed on other rail projects across Australia.

For this assessment, we have adopted unit rates that reflect the works being delivered by experienced and competent contractors within a brownfield rail environment but unencumbered from existing rail traffic. To achieve this, our DJC unit rates were independently established, and a regional adjustment was added to acknowledge the geographical spread of the rail network. Generally, these regional adjustments were adopted from those being advised by ARC, with these generally reflecting the remoteness of the rail infrastructure being renewed.

Unit rates developed from first principle are checked against benchmarked unit rates that have been extracted from multiple infrastructure projects including dedicated major interstate rail projects and rail projects within individual states. The extracted DJC unit rates are then adjusted to account for any escalation that has occurred during the intervening period, the volume of works and any other dissimilarities between projects.

In addition to the DJC unit rates we have assessed the appropriate on-costs added to achieve the calculated Sell unit rates. These "on-costs" are applied to the DJC rate to achieve the Sell unit rates and comprise:

- Locality Factor
- Contractor's Risk Allowance
- Contractor's On-Site Overheads
- Contractor's Margin

With these factors detailed in Table 4

It is assumed that all works will be delivered using a conventional Design and Construct Delivery Strategy Contract procurement method. As such, the percentage allowances for the contractor's indirect job costs have been established from typical Tier 1 contractors who would typically be expected to undertake works of this magnitude.

Generally, given the lack of transparency, the quantum provided has been accepted as being realistic across all the asset categories. No check measures have been undertaken to verify the quantities provided within the cost build ups.

3.2.2 Major Assets Categories

We note that the works are generally split into the major asset categories listed above, further broken down into sub-categories. Our unit rates have been established based on the following criteria:

- Base Date of Estimate is Quarter 4 - 2024.
- Excludes Project Risk and Contingency.
- Escalation is not included for this assessment.

Below an itemised table of specific assumptions incorporated within the estimates noting that for some subcategories we have adopted the ARC unit rates since they appear reasonable and in line with expectation.

Additionally, where we have relied on a Benchmarked unit rate, we have generally adopted it as a "Sell Unit Rate". Where we have calculated a unit rate from first principles, we have identified it as being a Direct Job Cost (DJC) Unit Rate in the Table 8 below:

Table 8 Direct Job Cost (DJC) Unit Rates

RIGHT OF WAY	
Formation	The CRC m2 unit rate for Formation works that has been applied within the Arc calculation equates to circa $50.44/m2 RPI reviewed this and have applied a unit rate of $53.03/m2 which benchmarks with several other rail projects currently in both execution and planning phases.
Access Roads	The CRC m2 unit rate for Access Road works that has been applied within the Arc calculation equates to circa $28.77/m2 RPI reviewed this and have applied a unit rate of $45.05/m2 which benchmarks with several other rail maintenance access roads (RMAR) within Australia.
Earthworks	No Change - Rate Reviewed was deemed Reasonable
Clearing & Grubbing	The CRC m2 unit rate of $7.77/m2 utilised within the Arc calculations is considered high given the areas being cleared. RPI have reviewed that and consider a more appropriate unit rate of $6.28/m2 is more reflective of the expected scope within the Clear & Grub Work Element.
CIVIL STRUCTURES	

Tunnels	No Change - Rate Reviewed was deemed Reasonable
Bridges	The CRC m2 unit rate for bridge works that has been applied within the Arc calculations equates to circa $9,479.79/m2 RPI reviewed this and have applied a unit rate of $10,481.63/m2 which benchmarks with typical concrete bridges that have been built on several other rail projects.
Culverts	RPI considered the Culvert valuations were overall significantly under-valued. We note that corrections for any over-specification of culverts on certain route sections may exacerbate this issue. Pipe sizing was rationalised across the elements and a revised Unit Rate applicable to a 600 Dia Pipe has been incorporated across the nominated lineal meterage presented in the Arc document reviewed. RPI have used a CRC Rate based on a typical 600mm Dia Pipe and have applied this to the Arc meterage provided. (Circa 170% increase). This typical sizing has been adopted as an 'average' value to better represent the network asset. Given the sheer volume of data, RPI did not individually itemise and price each culvert as part of the review process. RPI believe that this is an asset where there needs to be a significant amount of further work carried out to enable a more accurate value assessment.
ASSOCIATED TRACK STRUCTURES	
Level Crossings	Based on our current Level Crossing Cost Data compiled from recent projects across Australia the unit rate for a new level crossing has been increased to better reflect the expected construction cost of an average public level crossing. This is an average cost noting that some will be passive, and others will be active crossings, but it is assumed that all crossings require a sealed surface, fencing and either passive signage or active flashing lights or barriers.
TRACK	
Sleepers	A CRC unit rate for concrete sleepers has been included by Arc at $408.19/ea. RPI have reviewed this rate and rationalised it to a unit rate of $259.88/ea. This unit rate is based on the weighted average typical supply rate for full depth NG, SG and DG concrete sleepers. Revised unit rate based on current unit rates for concrete sleepers included in tender returns and contractor's cost estimates
Rail	An average CRC unit rate of $1,404,625 / track km has been included by Arc. RPI have review this rate and have adopted an average unit rate of $1,082,812.50 / track km This average revised unit rate is based on current unit rates included in tender returns and contractor's cost estimates for 60kg rail. Rail to be supplied in short lengths and welded to 110m lengths before being transported to site We note that there may be instances where lighter weight rail or second-hand part worn rails maybe available for use in low trafficked areas such as stabling yards in lieu of 60kg rails. RPI's understanding from suppliers is that 41kg rail size is best suited to light freight rail installation including crane rails, and tracks within workshop environments and the like. As such, the requirement to produce large quantities of 41kg rail would require a special order. In RPI's experience, the use of 41kg rail in sidings or shorter track lengths will often be sourced from "second-hand", part-worn supplies. However, this has not been considered here.
Ballast	An average CRC unit rate of $256 / track meter has been included by Arc. RPI have reviewed this rate and have adopted an average unit rate of $353.86 / track meter

	This average unit rate is based on typical construction methodology adopting 300mm ballast which is standard for heavy haul rail corridors. We note that there may be instances where less or more ballast may be available for use in low trafficked areas such as stabling yards. However, for this review this has not been considered here.
Turnouts	No Change – Overall rate reviewed and the rates for the supply and installation of turnouts was deemed reasonable
SIGNALLING & CONTROLS SYSTEMS	
Signalling & Comms	Costs have been assessed across the following key areas: • Fibre Optic cabling • Signalling • Communications • Radio Masts These are considered to be works that would be performed by specialist signalling and communications subcontractors. Whereas these costs will be unique to the specific locations, track layout, rail corridor requirements plus the number of turnouts, junctions, sidings and crossovers, indicative benchmarked unit rates have been calculated from other signalling and communications projects being proposed or constructed across both Urban & Freight Routes within Australia. These typical rates are then applied to the track length or route length quantities as appropriate. • Fibre Optic Cabling has been costed for those route lengths as advised in the Arc cost build up. • Signalling systems have been split into Communications Based Train Control (CBTC) and Train Order Working (TOW) systems based on the information and track lengths provided by Arc. • Communications systems have been calculated based on the route lengths as advised in the Arc cost build up. • Radio Masts have been calculated based on typical mast spacings along the route lengths as advised in the Arc cost build up. Uplifts for locality adjustment, and main contractor's overheads and margin have then been added onto the resulting costs, noting that the main contractor's overheads will be required given that they must manage, maintain, coordinate, and integrate the works being undertaken by the specialist subcontractors. Generally, RPI have adopted the quantum of assets as advised by the Arc submission. No check has been undertaken to validate the quantities provided.
BUILDINGS	
Adopt Value from Tables	Limited visibility therefore no change - Rate Reviewed was deemed Reasonable
MISCELLANEOUS	
Adopt Value from Tables	No Change - Rate Reviewed was deemed Reasonable

Table 9 below provides a summary of the variation in construction replacement costs between Arc valuation and the RPI assessed values:

Table 9 Arc Vs RPI Construction Replacement Cost (CRC) valuations by asset

Comparison Arc CRC vs RPI CRC						
Asset	**CRC (Arc)**	**CRC (RPI)**	**Diff $**	**Diff %**	**% of Total Diff**	**Notes / Comments**
Formation	$1,595.0m	$1,676.8m	$81.8m	5.13%	-5.78%	Revised Unit Rate
Access Roads	$606.5m	$949.5m	$343.0m	56.55%	-24.22%	Revised Unit Rate
Earthworks	$18.3m	$18.3m	$0.0m	0.00%	0.00%	No cost data available - adopt ARC Figure
Clearing and grubbing	$67.1m	$54.2m	-$12.9m	-19.21%	0.91%	Revised Unit Rate
Bridges	$485.8m	$537.2m	$51.3m	10.57%	-3.63%	Revised Unit Rate
Tunnels	$64.2m	**$64.2m**	$0.0m	0.00%	0.00%	Adopt value from tables
Culverts	$290.2m	$782.4m	$492.2m	169.63%	-34.76%	Increased to better represent the culverts nominated.
Level Crossings	$35.6m	$39.3m	$3.7m	10.50%	-0.26%	Revised Unit Rate
Sleepers	$2,893.9m	$1,842.4m	-$1,051.5m	-36.33%	74.26%	Revised Unit Rate
Rail	$7,402.4m	$5,706.4m	-$1,696.0m	-22.91%	119.78%	Revised Unit Rate
Ballast	$1,350.7m	$1,864.9m	$514.2m	38.07%	-36.31%	Revised Unit Rate
Turnouts	$455.5m	$455.5m	$0.0m	0.00%	0.00%	Adopt Value from Tables
Signals	$4,309.2m	$4,167.3m	-$141.9m	-3.29%	10.02%	Revised Unit Rate and approach
Control Centre	$24.7m	$24.7m	$0.0m	0.00%	0.00%	Adopt Value from Tables
Maintenance Facilities	$123.7m	$123.7m	$0.0m	0.00%	0.00%	Adopt Value from Tables
Depots	$13.8m	$13.8m	$0.0m	0.00%	0.00%	Adopt Value from Tables
Platforms	$0.0m	$0.0m	$0.0m		0.00%	na
Plant and Equipment	$61.8m	$61.8m	$0.0m	0.00%	0.00%	Adopt Value from Tables
Walkways	$70.1m	$70.1m	$0.0m	0.00%	0.00%	Adopt Value from Tables
Signage	$8.1m	$8.1m	$0.0m	0.00%	0.00%	Adopt Value from Tables
Total	**$19,876.5m**	**$18,460.5m**	**-$1,415.9m**	**-7.1%**	**100.00%**	

Key insights from the above table include:

- Overall, RPIs CRC is $1,416m less than Arc's estimated CRC (a reduction of 7%)
- Rail accounts for a reduction of $1,695.9m (22.91% reduction)
- Sleepers account for a reduction of $1,051m (36.3% reduction)

It should be noted that the construction replacement costs provided for the current assessment are for the hypothetical replacement of the entire Arc rail network spanning Western Australia. This would be a major commission, and in practice, would require multiple suitable contractors, resources, plant and materials at a theoretical scale exceeding the requirements for any practical real-world scenario. As such it is anticipated that Contractors working within the infrastructure industry would command higher margin levels in these circumstances.

3.3 Review of Railway Owner Costs

Replacement costs are estimated by applying the total cumulative percentage of the various factors allowed for to the estimated CRC.

Arc's proposal allows for the following railway owner costs (19.3% of direct CRC):

- Planning and design costs (4.0% of direct CRC)
- Planning and development costs (1.2% of direct CRC)
- Project and construction management costs (11.2% of direct CRC)
    - Project management supply (1.4% of direct CRC)
    - Project management install (2.9% of direct CRC)
    - Construction management (6.9% of direct CRC)
- Corporate and other costs (3.0% of direct CRC)

These are summarised in Table 10 below:

Table 10 Uplift factors for Railway Owner Costs

Components of Railway Owner Costs	
Railway Owner Costs	**Percentage of CRC**
Project Management	4.3%
Construction Management	6.9%
Planning, Design and Development	5.1%
Corporate and Other Costs	3.0%
TOTAL	**19.3%**

RPI believes these percentages are reasonable amounts to allow for owner's costs.

Design costs include all design related activities from initial feasibility studies, concept development and screening and support for development approvals to detailed design sufficient for construction. GHD assume that an optimised asset configuration would be constructed. GHD argue that based on design studies for rail infrastructure of the order of 4-6% of the capital costs for the assets (direct CRC), they adopt 4% based on the least cost (i.e. delivered efficiently).

Planning and Development Costs (1.2% of direct CRC) occur prior to commencing construction and entail planning and development consents in accordance with current planning legislation and planning and environmental approvals and permits required to ensure appropriate development controls are in place for the development of this scale and location. GHD undertook a bottom-up build-up of surveys, studies and consultation activities that would be required to construct the asset today. A cost and indicative duration were assigned to each individual activities based on the following assumptions:

- The legislative framework at the valuation date applies
- The development would be granted consent
- The corridor is virgin and with minimal contamination
- The development application would be for the entire project in a single application
- The Railway Owner would cover environmental offset costs associated with the developed area.

These costs are broken down as follows:

- Feasibility and input to preliminary design ((0.08% of direct CRC)
- Design development and planning approval (Federal and State) (0.94% of direct CRC)
- Construction support (0.19% of direct CRC)

Project and construction management costs are costs the Railway Owner would incur to manage the network construction activities. This includes overall management of all design and construction activities from project inception through to commissioning, up to the time when the asset can earn revenue. These costs include:

- Project management and non-technical support
- Project Controls
- Procurement and Contracts
- Finance & Accounting; and
- Document Control.

Corporate and other costs cover other Railway Owner overhead costs such as finance, accounting, human resources, employee related costs (e.g. mobilisation and demobilisation, R&R), employment relations, as well as costs for project related office space, information technology setup, hardware and software, taxes and insurances.

Applying these figures to our estimated construction replacement costs of $19,212m results in $3,708m, which is a reduction of $137m from Arc's estimate of $3,844.9m (a reduction of approximately 3.6%).

We also note that Arc separated the Railway Owner Costs into two components:

I. Owner Costs to Manage Supply ($280.9m)
II. Planning, Design and Other Owner Costs ($3,564m)

This was done to separate out the costs in managing supply of materials directly, so that they could allow for the additional costs associated with the alternative procurement approach they adopt to achieve efficiencies in procurement amounting to $2,650.3m. RPI does not endorse this approach on the grounds that:

i. it leads to outcomes that are disconnected from the likely reality of replacement.
ii. there are likely to be offsetting factors such as changes in contractor margins should the Railway Owner "hypothetically" change the nature of the contract with its suppliers under the alternative procurement approach.

Additionally, RPI estimates the funding costs over the capex profile duration by viewing capex as a series of 4-year projects over an 11-year capital expenditure profile. Assuming centralised procurement for the network does not align with our assumption of rolling four-year construction periods for estimating funding costs. Without making appropriate assumptions (such as this) and correctly applying regulatory and financial principles, the estimate of opportunity costs of the funds used during construction is erroneous, causing the estimated DORC to be excessively valued at approximately 44% of the ORC.

We note that in estimating the DORC for the ARTC for the ACCC, GHD's valuation allowed for Indirect Costs of 15% comprised of:

- Construction Management (7%)
- Project Management (5%)
- Corporate and other costs (3%)[14]

Planning and Design costs (2.5%) was applied to the total direct plus indirect costs, to allow for pre-construction costs including planning, approvals, concept design, procurement and detailed design. They state:

> *"Based on our experience in design studies for rail sector infrastructure, we consider that the costs for such a task [i.e. an efficient entrant undertaking feasibility and concept designs for the entire Interstate Network, with the detailed design following shortly after] would be in the order of 2-3% of the capital costs for the assets.*[15]

See section 9.3 for further discussion of comparables for railway owner costs. RPI has assessed the uplift factor of 19.3% as not too dissimilar from the uplift used for the ARTC DORC Valuation and ERA's 2013 Price Determination.

Railway owner costs are $3,563m, down from $3,845m (a 7% reduction).

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14 Aurizon Network Costing Manual — approved by QCA, effective 1 July 2019, identifies the below-rail expense categories that capture the owner / network costs that a DORC or owner-cost build-up would typically treat as "owner" or client-side items: network control & safe-working, maintenance (track/bridges/signals/traction), infrastructure management, business management, insurance, traction electricity and corporate overhead. The Manual explains how costs are identified, attributed and allocated between Below Rail and Other Services.

15 GHD Advisory also provide analysis which suggests Environmental Impact Assessments amounting to less than 1% of overall capital costs. (p37)

4 Review of Optimised Assets

Section 2.4 of the Costing Principles describes the rationale and considerations required for optimisation of the asset base, stating:

> *"The optimised asset configuration will be the asset configuration which has the capacity to meet the actual and reasonably projected demand, within the physical constraints of the existing railway corridor, that can be constructed at least cost.*
>
> *The level of service associated with the actual and reasonably project demand will be defined in terms of:*
>
> - *maximum axle loads;*
> - *maximum train speeds; and*
> - *maximum train lengths.*
>
> *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 associated with the actual and reasonably projected demand.*
>
> *The Railway Owner will:*
>
> - *identify redundant assets;*
> - *assess MEA capability against existing asset capacity;*
> - *assess demand forecast to identify any required changes in service capacity of assets;*
> - *determine the value of the optimisation; and*
> - *adjust the replacement cost by the optimisation to calculate the Depreciated Optimised Replacement Cost.*
>
> *To account for the differing maintenance costs of the actual asset configuration versus the optimised asset configuration, the net present value of the difference between the forecast operating cost of the actual Railway Infrastructure and the optimised Railway Infrastructure will be subtracted from the asset replacement cost.*
>
> *The Railway Owner will provide a ten year demand forecast based on ten years of historical demand data, and will provide a clear explanation of the forecasting method."*

4.1 Factors influencing optimisation

Arc identified 2.838km redundant track (mostly sidings) and 33.5km of loop lengths for optimisation, thereby removing inefficiencies from the asset base. Duplication has also been avoided by removing redundant building assets (i.e. Picton and Avon control centres) as these services are now provided from Midland and Canning Vale centres. This section considers the rationale for identifying assets as redundant and whether the MEA capability or forecast demand warrant optimisation of the asset base.

4.1.1 Assessment of redundant assets

Arc's proposal states that *"Railway infrastructure that is either disposed of or stranded is not included in the definition of optimisation".* RPI notes that it is important to take such asset stranding or risk of asset stranding into consideration in the establishment of the iRAB, as it is effectively the "line in the sand" on which access pricing will be based going forward. Likewise for asset disposals and redundancies.

RPI does not support some of the redundancy identified by Arc based on the rationale provided and the implications for efficiency. Instead, we propose that the non-operational routes be optimised from the asset base.

4.1.2 Assessment of MEA capability against existing asset capacity

Arc assessed that there was no requirement for optimisation based on surplus capacity associated with the MEAs used to estimate replacement costs. RPI assessed that no optimisation is required based on excess MEA capability.

4.1.3 Assessment of demand forecast to identify any required changes in service capacity of assets

Arc's assessment in relation to demand forecasts did not effectively consider demand due to them conflating demand and capacity. RPI assesses whether optimisation is required based on reasonable forecasts of demand for rail freight and required capacity by:

- Considering the historical growth for a sample of route sections relevant to the 2013 Determination to assess whether existing capacity is likely to be sufficient to meet future demand under various annual growth rates for freight (GTKs) and
- Reviews the stakeholder submissions to identify any instances where stakeholders have suggested that the levels of service are inappropriate for demand or where there may be commercial consequences that may need to be taken into consideration by the Regulator.

Based on the analysis undertaken and the forecast growth rates used to forecast demand, we support Arc's proposal that the existing capacity is likely to be sufficient to meet forecast demand for the next ten years. Greater detail supporting this assessment is presented below and in section 6.

4.2 Arc's approach to optimisation

Arc has applied the Costing Principles (section 2.4) that require that the optimised asset configuration be based on a ten-year demand forecast based on ten years of historical demand data. It defines the level of service associated with the actual and reasonably projected demand as the maximum axle loads, train speeds and train lengths. Arc provided GHD with the Level of Service Statement on which GHD concluded that:

- the future required capacity of the assets is not likely to be lower than that provided by the existing assets and
- there was no opportunity to reduce the replacement costs to resolve any inconsistencies between the level of service provided by the MEA and the existing assets.

Arc's optimisation reflects efficient service provision as they have attempted to:

- Eliminate surplus capacity by identifying and removing redundant assets
- Allow for the modernisation of technology and
- Considered route realignment where appropriate by accounting for recent and relevant projects.

While GHD submits that the optimised design allows for the current and expected service demand, they note that the review did not explore the need to increase the level of services beyond that offered by the existing Railway Infrastructure.

Arc's proposal identified those loops that were more than 300m shorter than the maximum train length and removed them on the basis that they were insufficient to service the maximum train length. Additionally, where loops exceeded the maximum train lengths they were shortened to match.

RPI believes that in specifying that "maximums" be considered to assess whether the capacity is required (or sufficient) to meet the forecast demand, the Costing Principles were aimed at ensuring the LOS reflects the maximum loads, speeds and lengths thereby reflecting the most efficient LOS for meeting the current and forecast demand. However, it is not useful to apply the maximum lengths in the current context to optimise loops, since these loops may be utilized by less than maximum levels of service (i.e. shorter trains or lesser TALs). That is, maximum levels are not necessarily the most

efficient levels of service. RPI believes a more in-depth analysis of capacity usage is required before arriving at their conclusion that a total loop length of 33.5km are redundant and therefore to be optimised from the base.

4.3 Overview of Access Demand (Current and Forecast)

This section reviews the forecast demand assessment required under Schedule 4, Clause 2(4) of the Railway access code (the Code) section 2.4 of the approved Costing Principles put forward by Arc. This involves reviewing Arc's *Level of Service Demand Forecast Statement* and Appendix 2 (Level of Service) of Arc's final submission *Applicable Railway Infrastructure DORC* (June 2025). For the purposes of this section, we used the data available to us at the time (prior to receiving GTK data by route following a S21(1) notice issued to Arc by the ERA).

In relation to demand forecasts, the Costing Principles state that the Railway Owner is to:

> *"assess demand forecast to identify any required changes in service capacity of assets" and is required to*
>
> *"…provide a ten-year demand forecast based on ten years of historical demand data and will provide a clear explanation of the forecasting method."*

Based on this assessment, the Railway owner is:

> *"To account for the differing maintenance costs of the actual asset configuration versus the optimised asset configuration, the net present value of the difference between the forecast operating cost of the actual Railway Infrastructure and the optimised Railway Infrastructure will be subtracted from the asset replacement cost.*

Arc's submission relies on its Level of Service Demand Forecast Statement (LOS) which specifies axle loads and speeds (interdependent) for each Route Section. It sets out its forecast, historical and existing demand based on the following:

- Forecast Demand - Section 4 of the LOS provides a table showing maximum train lengths for each Route Section, where Arc states, "Unless otherwise stated, this is the Level of Service demand forecast for the next ten years."
- Historical demand - Section 5 shows the number of years in the last 10 years for which there was an agreement in place requiring that particular LOS.
- Existing demand - Section 6 shows those axle loads and speeds, or train length for which there was "at least one agreement in place as at 31 December 2024" which demanded at least that axle load and speed, or train length, on that Route section.

Figure 2 provides an extract from Arc's Level of Service and Forecast Demand Statement to illustrate their approach for route 1.

Maximum Train Lengths (metres) Historical Demand																				
Network Group	Route Section	0 to 100	100 to 200	200 to 300	300 to 400	400 to 500	500 to 600	600 to 700	700 to 800	800 to 900	900 to 1000	1000 to 1100	1100 to 1200	1200 to 1300	1300 to 1400	1400 to 1500	1500 to 1600	1600 to 1700	1700 to 1800	1800 to 1900	1900 to 2000
EGR	1.SG Avon to Kalgoorlie | Avon Yard to West Merredin	0	0	0	0	0	0	10	0	4	0	0	0	0	8	0	0	0	10	0	0
EGR	1.SG Avon to Kalgoorlie | West Merredin	0	0	0	0	0	0	10	0	4	0	0	0	0	8	0	0	0	10	0	0
EGR	1.SG Avon to Kalgoorlie | West Merredin to Merredin	0	0	0	0	0	0	10	0	4	0	0	0	0	8	0	0	0	10	0	0
EGR	1.SG Avon to Kalgoorlie | Merredin to Southern Cross	0	0	0	0	0	0	10	0	4	0	0	0	0	8	0	0	0	10	0	0
EGR	1.SG Avon to Kalgoorlie | Southern Cross to Koolyanobbing East	0	0	0	0	0	0	10	0	4	0	0	0	0	4	0	0	0	10	0	0
EGR	1.SG Avon to Kalgoorlie | Koolyanobbing East to Mount Walton	0	0	0	0	0	0	10	0	4	0	0	0	5	4	0	0	0	10	0	0
EGR	1.SG Avon to Kalgoorlie | Mount Walton to West Kalgoorlie West	0	0	0	0	0	0	10	0	4	0	0	0	5	3	0	0	0	10	0	0
EGR	1.SG Avon to Kalgoorlie | West Kalgoorlie West to West Kalgoorlie	0	0	0	0	0	0	10	0	0	0	0	0	0	3	0	0	0	10	0	0
EGR	1.SG Avon to Kalgoorlie | West Kalgoorlie	0	0	0	0	0	0	10	10	0	0	0	0	0	3	0	0	0	10	0	0
EGR	1.SG Avon to Kalgoorlie | West Kalgoorlie to Kalgoorlie	0	0	0	0	0	0	10	10	0	0	0	0	0	3	0	0	0	10	0	0
EGR	1.SG Avon to Kalgoorlie | Kalgoorlie	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0
EGR	1.SG Avon to Kalgoorlie | Kalgoorlie to Parkeston (border)	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	10	0	0

Figure 2 Extract from Arc's Level of Service and Forecast Demand Statement

With regards to the forecasting method adopted, this LOS states that:

(a) "where an Agreement existed granting Access during the prior 10 years, the maximum LOS required by those agreements on those Route Sections is taken as the reasonably forecast LOS demanded for the next 10 years, on the basis that this demand is expected to continue; otherwise

(b) where there has been no Agreement granting Access during the prior 10 years (in particular, on non-operational lines), the reasonably forecast LOS demanded for the next 10 years is taken to be equivalent to the LOS when the section was last operational, on the basis that future tasks will require at least that LOS because it is typically modest relative to modern railway infrastructure; otherwise

(c) where a Route section is a siding, yard, or similar non-mainline part of the Network, a Network wide LOS is taken as the reasonably forecast LOS demanded for the next ten years, on the basis that the future tasks utilising those sections will be subject to the same safe operating limits that currently apply.

In practical terms, there are agreements for shorter length trains, such that the optimised loops may still be used and therefore part of the asset base. Figure 2 above presents an extract from Arc's LOS Statement for part of Route 1. It shows that for the 1. SG Avon Yard to West Merredin section of the Avon to Kalgoorlie route, in 10 of the last 10 years there was at least one agreement for a 700m train length, in 4 years there was at least one agreement for a 900m train length, for 8 of those years there was at least one agreement for a 1,400m train length and for 10 of the last 10 years there was at least one agreement for a 1,800km train length.

4.3.1 RPI's assessment of Arc's analysis of forecast demand

Typically, demand determines capacity. Arc's submission assumes that capacity represents demand, with existing capacity (in terms of maximum loads, speeds and lengths) taken to represent forecast demand. While the Code states that the demand forecasts are to "take into account" the physical capacity of the routes, GHD have conflated demand with capacity. This does not necessarily mean that the measured costs are incorrect, but rather that the required supporting information underpinning forecast demand was not used to support their claim.

It is plausible that assets that are not used will still be captured in the RAB, going against the principle of ensuring that access holders are charged for what they use or will be required to use to meet forecast demand over the next ten years. Arc's methodology makes it difficult to capture the true extent of under-utilisation of Arc's assets. To the extent that some routes have been made redundant, this may offset the extent of the problem. However, we note that the redundancies identified in Tables 5-1 and 5-2 are mostly loops and sidings, with this having a limited impact on potential for overcharging on mainlines.

Rail freight demand (e.g. gross tonne-kilometres GTKs) is a better forecast taking into consideration a range of factors such as:

- the volume of freight moved over a specific distance

- the mode share (rail versus road)
- freight train paths
- the use of rail at ports, and
- the reliability and efficiency of rail operations and government policies affecting these.

Therefore, there should be a realistic estimate of volumes based on current and near-term developments, rather than simply relying on maximum track capacity.

RPI examined the regulatory approaches to these issues in other jurisdictions and identified information gaps in Arc's proposal. We examined guidance and requirements outlined by other regulators such as the ACCC and IPART in relation to this issue and considered the methodology GHD used to analysis of the forecast demand in its October 2021 report for the DORC valuation for ARTC. We also examined Network Rail's analysis of forecast freight and implications for capacity for the Office of Rail and Road (ORR). We concluded that similar information was required for the ERA to meet the objectives of the Railways (Access) Act 1998 and to achieve transparency for stakeholders.

RPI provided clarification questions to the ERA about the above issues, with Arc responding as follows:

> *"Arc have provided historical data as per the defined demand in its submitted Level of Service Statement."*

ERA obtained the relevant GTK data by route section from Arc September 2025 following a Section 21 (1) notice. This data is important for understanding the rail freight market, current capacity and whether it is sufficient to meet forecast demand. It also identifies possible risks of asset stranding or market conditions justifying a departure from straight line depreciation. Analysis must consider the overall policy environment to ensure that the objective of the Railway (Access) Act 1998 is met by ensuring efficient levels of investment and pricing within the rail freight sector. This more detailed data is used in section 6 of this report.

The Bureau of Infrastructure and Transport Research Economics (BITRE) in November 2022 published its *Multimodal Australian aggregate freight forecasts – 2022 update*.[16] These forecasts from 2020 to 2050 provide short, medium and long-term forecasts by transport mode based on global and domestic production and consumption trends for key freight categories. For the purposes of this analysis, we focus on the forecast share of rail freight and the central scenario forecasts for key categories.

Two qualifications are important. These forecasts are aggregate forecasts and there may be differences at a more granular level. RPI will consider any stakeholder feedback that may suggest such differences warrant further consideration. Secondly, the BITRE states that their analysis is based on the likely outlook for existing commodities, and do not explicitly factor in potential new transport tasks that may emerge in response to new technological opportunities.

BITRE projects that total domestic freight will increase 26% from 2019/20 to 2049/50, which amounts to 0.9% pa on an annualised basis. This is significantly lower than the 3.7% pa growth experienced during the last 30 years. The key driver behind this slowdown is the slower expected growth in the domestic movement of bulk iron-ore and coal export freights, both of which accounted for approximately 89% of the total domestic rail freight in 2020. The annualised growth for road freight out to 2050 is 1.9% pa, while rail amounts to 0.18% pa (with the latter down from 5.6% pa over the last 30 years).

RPI received additional information from the BITRE September 2025, which we have incorporated into our analysis. They support the assumed growth rates that we have used to assess whether current capacity (service levels) is sufficient for meeting forecast reasonable demand for the next decade.

Table 11 sets out the forecast freight task by major transport mode in 2022. The relevant period for the purposes of estimating the DORC for Arc's network is the demand forecast for the next 10 years. Therefore, of most relevance is the fact that rail's share of the freight task is expected to decrease from 57% to 52% between 2025 and 2035, while road's share is projected to increase from 30% to 36%.

16 The bureau falls under the Department of Infrastructure, Transport, Regional Development, Communications and the Arts.

Table 11 Projected future freight task, by major transport mode (billions tkm), 2020 - 2050

Projected Future freight task, by major transport mode (billion tkm), 2020-2050									
Year	Road	%	Rail	%	Coastal	%	Air	%	TOTAL
2020	222.9	29%	433.2	56%	111.4	15%	0.3	0.04%	767.9
2025	250	30%	480.9	57%	106.7	13%	0.4	0.05%	838
2030	278.3	33%	458	54%	108.3	13%	0.4	0.05%	845
2035	307.7	36%	451.6	52%	105.5	12%	0.5	0.06%	865.2
2040	337.2	38%	453.5	50%	107	12%	0.5	0.06%	898.2
2045	366.1	39%	455.6	49%	108.6	12%	0.5	0.05%	930.8
2050	393.7	41%	457.8	48%	110.1	11%	0.6	0.06%	962.2

Source: BITRE estimates, BITRE Multimodal Australian aggregate freight forecasts – 2022 update (November 2022)

BITRE's aggregate domestic rail freight forecasting model splits rail freight into five separate broad freight segments:

1. Iron ore
2. Coal
3. Bulk grains
4. Non-bulk and
5. Other bulk

Figure 3 below illustrates the relative growth in these segments from 1971.

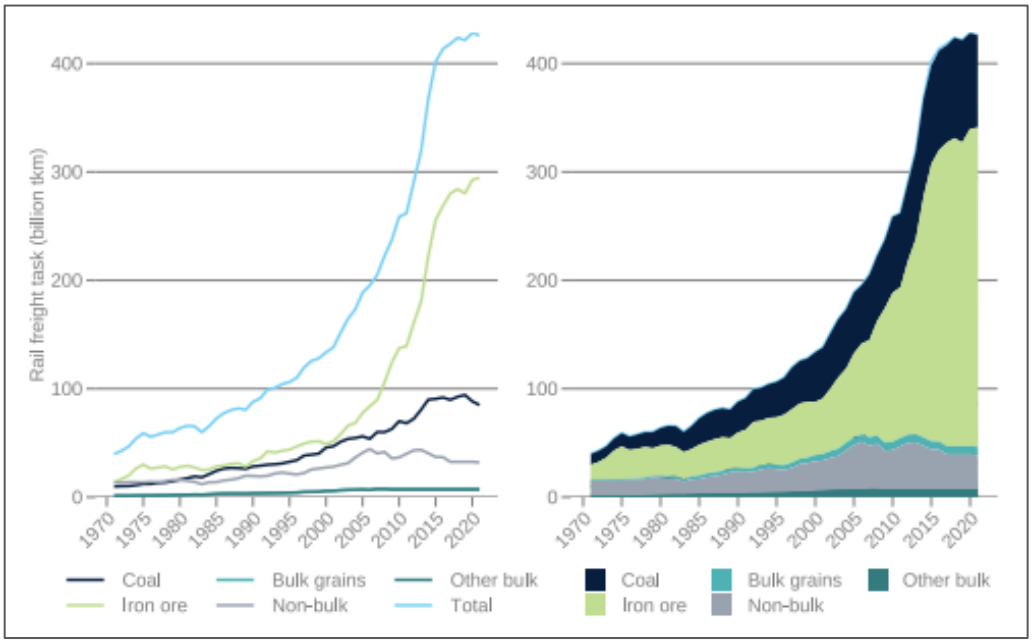

Figure 3 Australian rail freight task, by major commodity group, 1971–2020[17]

Of note is the significance of iron ore movements to the total Australian rail freight task (increasing from approximately 35 per cent of total rail tonne kilometres in 1989–90 to around 68 per cent in 2019–20) and the volumes of coal carried (tripling over this period while at the same time experiencing a fall in share of total rail freight volumes from approximately 32 per cent in 1989–90 to around 20 per cent in 2019–20).

The drivers for past and future growth in each major category are very different. Of relevance for the purposes of RPI's review of Arc's submission is to provide supporting evidence that existing capacity on Arc's network is in fact sufficient to meet the forecast demand for rail freight services to 2035. To do this, we present the projections in terms of total

17 WSA (2021) and earlier issues.

volumes, overall projected increases and annualised percentage increases at a relatively high-level. The central scenario forecasts developed by BITRE have a CAGR for rail freight of 0.18% pa from 2020 to 2050. There are significant differences between forecasts for different types of freight (e.g. East-West non-bulk freight is forecast to increase 68% at a CAGR of 2.2% pa to 2050, while steel and other bulk commodities is forecast to increase by 26% at a CAGR of 0.75%pa to 2050. Bulk grain lies between these forecasts, with a CAGR of 1.25% pa to 2050.

Table 12 lists demand and forecast demand for rail freight across a sample of routes relevant to the 2013 Determination to understand how freight demand has changed between 2012 and 2023 in terms of GTKs. Based on this comparison, it appears that the above claims are correct, with road freight substituting rail freight.

Table 12 Analysis of forecast demand and required capacity – Selected 2013 Determination routes

Analysis of demand - 2013 Determination (GTK 2012) vs 2023 and BITRE forecast growth -Sample Route Sections													
Network	**Route No.**	**Route** **Route Section**	**km**	**GTKs 2012**	**%**	**GTKs 2023**	**CAGR 2012-2023**	**GTK 2035 based on CAGR 0.18% pa**	**% Increase 2023 - 2035**	**GTK 2035 based on CAGR 1.25% pa**	**% Increase 2023 - 2035**	**GTK 2035 based on CAGR 2.1% pa**	**% Increase 2023 - 2035**
EBL	5	Kambalda to Esperence											
		Kambalda to Redmine											
	349.9	*Kambalda to Salmon Gums*											
		Salmon Gums to Esperance											
EGR	1	West Merredin to Koolyanobbing East											
		West Merredin											
	199.7	*West Merredin to Merredin*											
		Merredin to Southern Cross											
		Southern Cross to Koolyanobbing East											
EGR	1	Koolyanobbing East to West Kalgoorlie											
		Koolyanobbing East to Mount Walton											
	212.2	*Mount Walton to West Kalgoorlie West*											
		West Kalgoorlie West to West Kalgoorlie											
		West Kalgoorlie											
EGR	1	Avon Yard to West Merredin											
MR	38	Millendoon Junction to Moora/Dongara											
		Millendon Junction to Watheroo											
	395.0	*Watheroo to Marchagee*											
		Marchagee to Dongara											
Midwest	40	Nangulu to Tilley											
		Narngulu to Narngulu East											
		Narngulu East to Mullewa											
	204.3	*Mullewa to Tilley Junction*											
		Tilley Junction to Tilley											
TOTAL													

Key insights from the above comparison include freight demand based on GTKs for relevant routes accounting to approximately 30% of Arc's network include:

- Between 2012 and 2023, GTKs on these routes have fallen from [redacted] equating to an average annual decline [redacted]
- In absolute terms, the tonnage has fallen by [redacted] GTK between 2012 and 2023.
- Based on a low CAGR of 0.18% and a high of 2.1%, the forecast increase in freight demand to 2035 could range from 10,727m GTK (a 2.2% increase; 0.18%pa growth) to 12,187m GTK (a 16.1% increase; 1.25%pa growth) to 13,473m GTK (a 28.3% increase; 2.1% pa growth).

With BITRE forecasts assuming a continuation of the trend towards the substitution of road for rail freight to 2035, and the relatively modest overall increases in rail freight demand to 2035, RPI considers Arc's assessment that the current capacity is likely to be sufficient for meeting reasonable forecast demand is reasonable assumption to make.

Section 1.4 discussed that since 2019, WA and the Commonwealth have co-invested $200M+ in Agricultural Supply Chain Initiative (ASCI), upgrading roads, intermodal terminals, and some Tier 1 and 2 rail lines, however, rail access remains a barrier. CBH and growers argue that rail access remains a barrier, with Arc's lease terms discouraging long-term rail investment and driving more grain onto trucks, worsening road safety and costs. In August 2022, the WA Government released its Grain Freight Supply Chain Strategy to improve efficiency, reduce bottlenecks, and prepare for projected grain harvest growth, with CBH forecasts suggesting an average of 25–30 Mt by the 2030s, up from 20 Mt. This increase out to 2035 implies a compound average growth rate of 4.6% pa, which is more than twice the upper percentage used by RPI to assess whether current capacity is sufficient to meet reasonably forecast demand. The implications of this are as follows:

- A more detailed approach may be required by consultation with key stakeholders to understand their future growth and rail freight demands out to 2035
- Further scenario or sensitivity testing may be required to fully understand the risk associated with the DORC valuation and implications it may have for stakeholders and
- The case for accelerating depreciation may need further investigation to deal with the commercial imperatives of stakeholders and the broader economy, notwithstanding important considerations of returns on infrastructure for the Railway Owner.

To the extent that privately funded and owned infrastructure can meet these higher growth rates for demand, the valuation of the iRAB will be less relevant.

4.4 RPI's approach to optimisation

Based on our assessment, RPI recommends:

- optimising the non-operational routes from the asset base
- removing optimisation associated with the extension of loops as proposed by Arc
- adjusting Arc's estimated optimisation to retain other estimates of optimised assets (including the redundant sidings and loops (2.838km) identified in Arc's Table 5-1)

We posit that these loops (33km) are important to the utilization of the track, and the estimated length reductions are the result of applying maximum train lengths in a manner that disregards more practical considerations of how the route is used or may need to be used to meet demand.

RPI notes that stranded assets should be optimised out of the asset base if they are not being used and are unlikely to be used after considering the reasonably forecast demand for the next ten years. Likewise, assets which have been disposed of should also be optimised out of the asset base if they are currently being included in it. [redacted]

[redacted] Table 13 lists the optimisation by Arc and RPI.

The following responses by Arc across the three clarification registers provide the rationale for how RPI has treated Arc's optimisation. Arc's response to reference 39 in the clarification register (23 July 2025) states:

> "Optimisation approach for track assets is articulated in section 5.1.3 of the submission. In summary the following assumptions have been made:
>
> - Replacement cost MEA's were chosen as the lowest cost which most closely aligns with the current Network assets
> - Required capacity was deemed to not be lower than that provided by the existing assets, therefore no optimisation was available as a result of demand
> - A number of redundant assets (including track, ballast, sleepers) were removed as identified in Tables 5-1 and 5-2 of the submission.[18]

Arc's response to reference 9 in the clarification register (11 July 2025) and reference 47 (23 July 2025) state "Confirming the track costs generated earlier in the report are based on, and already incorporate, the Alternative Procurement Methodology" and "When an updated submission is provided, this will be broken down further to show how the OCC (Conventional Procurement) is derived, before stepping through the Alternative Procurement.".

RPI has drawn from the above responses that, in relation to track assets, Arc conclude that there is no optimisation required due to the MEA providing excess capacity, nor as a result of forecast demand considerations. We also note that Arc have included their identified alternative procurement cost savings into the figures as presented in Table 5-17 of their submission. Because Arc separate both components in Table 0-1 of their submission's executive summary, RPI also treat both separately in our DORC Summary (see Table 1). Doing so results in a balancing figure of $158.1m for optimisation, and we use this figure as the basis of our comparison for optimisation.

This approach ensures that RPI analysis is based on a comparison of Arc's total ORC of $20,913m as presented in their Table 5-17.

[18] Arc also note that further information on these is included in clarification response #43 previously provided, dated 10th July 2025).

Table 13 Optimisation by asset type – Arc Vs RPI

Optimised Replacement Costs by Asset Type - ARC Vs RPI Proposed Optimisation							
		Break-down		Source of optimisation			
Asset MEA	Arc's Optimisation	Alternative Procurement Cost Savings	Due to MEA/Demand Consideratio	Non-op routes CRC	Non-op routes - ROC	Retained from Arc's estimate	RPI's Optimisation
Right of Way							
Formation	-$11m			-$284m	-$55m	-$11m	-$350m
Access Roads	-$4m			-$161m	-$31m	-$4m	-$196m
Earthworks							
Clearing and Grubbing							
Sub-total	**-$15m**		**-$15m**	**-$445m**	**-$86m**	**-$15m**	**-$546m**
Civil Structures							
Bridges				-$43m	-$8m		-$52m
Culverts				-$613m	-$118m		-$732m
Tunnels				$0m	$0m		$0m
Sub-total				**-$657m**	**-$127m**	**$0m**	**-$783m**
Level Crossings				-$1.92m	$0m		-$2m
Sub-total				**-$2m**	**$0m**	**$0m**	**-$2m**
Track[a]							
Rail	-$1,605m			-$967m	-$187m		-$1,253m
Sleepers	-$805m		-$99m	-$247m	-$48m	-$99m	-$295m
Ballast	-$319m			-$316m	-$61m		-$377m
Turnout	-$20m			-$51m	-$10m		-$60m
Sub-total	**-$2,750m**	**-$2,650m**	**-$99m**	**-$1,580m**	**-$305m**	**-$99m**	**-$1,985m**
Signalling and Communications[b]	-$26m			-$318m	-$61m	-$26m	-$406m
Sub-total	**-$26m**		**-$26m**	**-$318m**	**-$61m**	**-$26m**	**-$406m**
Buildings							
Centralised Control Centres[c]	-$16m			-$0.01m	$0m	-$16m	-$16m
Maintenance Facilities	-$1m			-$0.07m	$0m	-$1m	-$1m
Depots	$0m			$0.00m	$0m	$0m	$0m
Sub-total	**-$17m**		**-$17m**	**-$0.1m**	**$0.0m**	**-$17m**	**-$17.3m**
Miscellaneous							
Plant and Equipment				-$0.01m	$0m		$0m
Signage				-$0.001m	$0m		$0m
Sub-total				**-$0.02m**	**$0.00m**	**$0.00m**	**-$0.02m**
TOTAL ASSET OPTIMISATION	**-$2,808m**	**-$2,650m**	**-$158m**	**-$3,002m**	**-$579m**	**-$158m**	**-$3,740m**

a Arc's response to reference 9 in the clarification register (11 July 2025) states "Confirming the track costs generated earlier in the report are based on, and already incorporate, the Alternative Procurement Methodology". In response to reference 47, the clarification register (25 July 2025) states "When an updated submission is provided, this will be broken down further to show how the OCC (Conventional Procurement) is derived, before stepping through the Alternative Procurement.".

b Section 5.5.1 of Arc's proposal states that optimisation for this asset group involved removing any lines currently not in use.

c Section 5.6 of Arc's proposal states that services that Picton and Avon control centres provided are now undertaken from the Midland and Caning Vale centres, and are therefore redundant.

Based on the above analysis and excluding alternative procurement cost savings from Arc's total figure of $2,808m, RPI's optimisation amounts to $3,740m from Arc's estimate of $158m, an increase of $3,582m (a 2,265% increase).

5 Estimation of Contributed Assets

Under the WA Rail Access Code, only assets that Arc has funded and that are on the Schedule 1 routes are automatically eligible for inclusion in the RAB. Assets that benefit a single access holder or are built specifically for them are often funded by the user, are excluded from the RAB to avoid double recovery. This also applies for government grants, as taxpayers have already paid for that portion of the asset base.

Section 1.4 of the Costing Principles defines contributed assets as:

> *"Has the meaning described in section 47B of the Code, as follows:*
> *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.*
>
> *For the purposes of these Costing Principles, means any contribution of the kind described in section 47B of the Code, made by anyone other than the entity who was the Railway Owner (or an Associate of the Railway Owner) at the time the contribution was made."*

Arc's submission states (s7.1) that *"Arc has confirmed that none of the assets in this DORC are contributed assets. There has therefore been no adjustment for any contributed investment".*

RPI examines the validity of this statement by considering:

- capital upgrades to the network (taking care to distinguish these from renewals) and excluding those yet to be commissioned
- the legal ownership of the relevant assets and which entity is responsible for their related costs (i.e. exclude leased assets)
- stakeholder feedback providing evidence of capital contributions to the network and the terms of agreements which suggest the access holder contributed capital
- publicly available information around federal or state government fundings of parts of the network.[19]

5.1 Capital expenditure on Arc's network

Arc publishes a summary of capital works on its website. It lists the recurring capital works and improvements to the Network on an ongoing basis to ensure assets are fit for purpose. Arc have not supported their statement above with any description of capital works undertaken and the nature of them, along with details of how and when they were funded. As such, their submission lacks supporting information.

In the absence of such information, RPI considers earlier published information by both Arc and from other sources to estimate the level of contributions. Arc in its 2017 Issues Paper Submission notes that some upgrades result in increasing operating standards for customers. Arc conducts non-recurring capital works and improvements to the Network on an ad hoc basis, with these non-recurring works relating to more discrete packages of work, generally consisting of large-scale one-off projects.

Contributions to these assets can occur directly or indirectly through access charges, noting that it is necessary to isolate the component relating to contributions to ensure that they are "*are not payments of prices and charges for access".*

[19] With the change from GRV to DORC, the mechanism shifted from an *ex-post crediting in the ceiling test* under GRV to an *ex-ante exclusion/deduction from the RAB* under DORC. The policy intent in both is to avoid double charging on government-funded assets.

5.1.1 Assets included in the Arc's asset base

Before establishing the level of contributions to deduct from the RAB, it is important to understand whether such assets have been included in the RAB to begin with. While this could be considered somewhat circular in logic, as identifying as asset as contributed to remove it will ensure it is not included, identifying it for removal is predicated on it being included. RPI [redacted] and therefore cannot verify this asset without supporting information.

Capital expenditure is an upgrade (e.g., stronger track, new signalling, longer sidings) where it serves new or expanded service potential, and it is therefore capitalised into RAB. Renewals maintain existing infrastructure and are treated as capital for regulatory modelling, but do not expand the value of the RAB.

The type of asset can also influence whether it is included in the RAB. For example, a spur must be part of a route listed in Schedule 1 of the Code. The spur must be available for use or intended use by third parties (i.e. an access seeker). If it only serves a private purpose (e.g. an exclusive mine spur with no third-party use), it may be excluded.[20]

The expenditure must also meet the definition of "Railway Infrastructure", which under the Code and the Railways (Access) Act 1998, includes track, signals, sidings, and other fixed assets used in train operations.

Finally, it must be capitalised and owned by the Arc (i.e. capitalised on the books of the railway owner), not merely leased or privately owned by a customer. If it was constructed and funded by a third party and not transferred to Arc, it may not be included.

5.1.2 Arc's capital expenditure

Arc have not provided details of capital upgrades by route or route section to the ERA for RPI's review. Arc in its 2017 report *Issues Paper Submission* to the ERA provides some level of detail around capital upgrades. Arc states:

> *"Since 2010, Arc has invested $2b (not including government investment) directly into the Arc Network."* (paragraph 67)

and

> "*Closure and subsequent request by CBH to use Tier 3 routes (marginal routes)*" (paragraphs 318-321)

RPI has attempted to reconcile reports of capital expenditures since 2009 and confirmed with ERA that no Tier 3 routes have been brought back into service as a result of the 2013 CBH proposal or for any other reason.

Arc's 2017 submission lists *"a number of significant capital expenditure projects which have delivered a modernised and upgraded Arc Network, including*:

> *"a) installation of concrete sleepers on the South West Main;*
> *b) upgrading the Kalgoorlie to Esperance line through re-railing and re-sleepering;*
> *c) the $550m Arc funded major upgrade of the Geraldton Backline;*
> *d) re-sleepering from 1:4 steel/timber to 1:2 steel/timber of over 1,247 km of dedicated Grain Freight Rail Network;*
> *e) the upgrade and re-railing project for the Leonora to Kambalda line;*
> *f) re-railing and replacement of concrete sleepers on the railway from Perth to Kalgoorlie; and*
> *g) installation of fibre optic cable data and open channel radio network over the 385km section of railway from Kalgoorlie to Esperance".*

In relation to the upgrade noted in item (c) above, Arc's 2017 submission states (para 352 and 354 respectively):

> *"Given that foundation customers typically underpin network expansions, Arc considers it critical that their interests should be protected under the regulatory regime. Although Arc's railway network is technically a*

[20] That is, inclusions must also be consistent with Arc's Costing Principles in terms of treatment of assets with shared or limited use.

brownfields investment, we nevertheless consider Karara Mining to be the foundation customer for the Tilley to Geraldton section of the network due to the substantial upgrade undertaken to provide access."

and

"Foundation customers generally bear materially different costs and risks. They may for instance, bear significantly greater access costs, to reflect the fact that infrastructure has been built for their needs, as opposed to other customers accessing pre-existing infrastructure, who then bear a share of the operating cost of that infrastructure. Depending on arrangements, significant risk can either sit with the foundation customer, the railway owner or both. Any amendments made should be flexible enough to consider and protect the interests of both parties. This answers question 6.3 of the Issues Paper as to whether the costs and risks borne by foundation customers materially differ to those borne by subsequent customers."

Karara Mining Limited (KML) submitted two stakeholder submissions to Arc's Final Report for its *Applicable Railway Infrastructure DORC* and states that it contributed capital and bore substantial risk in the following three ways:

[redacted][22]

This is further supported with a stock exchange announcement the day after the signing of a key long term agreement, KML's then-shareholder, Gindalbie Metals Limited (ASX: GBG), released a stock exchange announcement disclosing the $450 million upgrade project cost and the agreement. The announcement stated that KML had signed a long term agreement with Arc, involving a major upgrade project costing approximately $450 million. The announcement said KML would sign a facility agreement for US$300 million in bank guarantees and pay a "capital recharge fee" throughout the contract period. While RPI understands that the parties may have a dispute regarding the amount of capital contributions, for the purposes of reviewing Arc's DORC within the time constraints of our consultancy agreement with the ERA, we will proceed on the basis that $450m is contributed capital, in addition to the in-kind contribution for the supply of rail, which is relatively immaterial.[23]

KML's submission (11 August 2025) states that:

[redacted]

[21] [redacted]

[redacted]

In addition, $200m (joint Federal and State government) has been contributed as part of the Agricultural Supply Chain Improvements (ASCI) Program 2022-24, with $22m funded by Arc, with $45m from each of the Federal and State governments for the Milan Junction - Avon-Carnamah-Mingenew-Geraldton (Midland Line upgrade (Carnamah-Mingenew)) and the remainder was for sidings extensions and upgrades for CBH operations to enable longer trains and better loading throughput.

Not all the $2b capital investment in the Network would be included in the iRAB, since it is important to only capture the capital upgrades (enhancements in service capacity), rather than maintenance of service capacity. From a regulatory valuation perspective, renewals don't increase the *optimised replacement cost* (ORC) or the RAB beyond what's needed to reflect the service level (i.e. they just refresh it). In the case of the narrow-gauge re-sleepering program (SGNR, $241m) even though it was a *renewal*, the replacement of timber with concrete sleepers introduced a material difference: longer asset life, lower maintenance, higher reliability. Regulators usually say: the MEA in a DORC is concrete sleepers anyway (timber is obsolete), so the renewal is consistent with the "modern equivalent asset" specification. Therefore, the program *looks like a renewal* from an operational perspective, but from a valuation perspective it aligns the asset base with the MEA standard.

In relation to Government contributions and noting that Arc's figure of $2b in its 2017 report excluded such contributions, the government's $200m plus expenditure to 31 December 2024 on level crossings should not sit within the asset base as it sits within PTA's network, rather than Arc's. ERA sought clarification from the Department of Main Roads who provided the following clarifications:[25]

- Motor level crossings fall under the PTA, rather than Arc's network
- Pedestrian crossings fall under Arc's network (there are 203 pedestrian crossings inclusive of private access facilities, 40 of which are located on non-operational rail lines. (This number differs to Arc's records.)
- There are also no 'unprotected' pedestrian crossings located on operational rail lines.
- Arc do not have ownership of the pedestrian crossing controls (They again note that this differs to Arc's claim).
- *"Funds for public railway crossing control are provided by the State Government. All costs associated with controlling crossings not located on public roads are to be met as agreed between to Road Manager and the Rail Infrastructure Manager. …Installation and maintenance of pedestrian crossings is undertaken by Arc at the cost of the relevant road or path manager."*[26]

CBH note in their submission that (paras 14, 383, 384)

- several government funding agreements are documented on the Public Transport Authority's website, including the narrow-gauge re-sleepering), which involved a $241 million Government grant documented in the PTA and WestNet Rail funding agreement[27].

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24 [redacted]

25 Email communication between Main Roads Western Australia and ERA, 28 August 2025.

26 This is an excerpt from the Railway Crossing Control in Western Australia Policy & Guidelines.

27 Schedules 6 to 10, Project Agreement for Capital Works – Dedicated Narrow Gauge Grain Lines. CBH provide the following detail in support of their view that these should be considered to be contributed assets taken from the agreement titled "Project Agreement for Capital Works – Dedicated Narrow Gauge Grain Lines" between the PTA and WestNet Rail dated 9 July 2010. It states in Schedule 6 that:

- Capital works valued at $43.5 million ($2010 terms) would be spent between Avon and Redmond, of which $35.25 million ($2010 terms) would be funded by the PTA.
- The Brookfield / Arc monthly reports dated September 2011 show that these works were completed or substantially completed.
- Sleepers replaced between Avon to Redmond form part of Arc's DORC, despite those assets clearly appearing to have been funded in whole or part by the PTA (estimated at $120m by CBH and scaled back to $75.6m by RPI to reflect the extent to which RPI's CRC estimate was for sleepers was lower than Arc's (i.e. 63% of the cost for sleepers estimated by Arc). See CBH submission p53 for further detail.

- evidence of third-party contributions is included in Arc's 2024 annual report, which shows a total balance of Government and third-party contributions of $178 million.[28] Of this amount, $171 million represents Government funding designated for the purchase, construction or acquisition of new assets or as compensation for expenses or losses incurred.

CBH also refer to details of the capital upgrades budgeted for by Cliffs Natural Resources Inc., an international mining and natural resources company and member of the S&P 500 Index. This company is a major global iron ore producer and in its 2010 and 2011 Annual Reports describes the capital upgrades planned for their Koolyanobbing Mine in Western Australia. RPI has reviewed these annual reports and included the amounts listed in CBHs submission, noting that the amounts elaborated in the annual reports are larger again. Without further detail on the terms of the access agreements, we consider it prudent to adopt the lower figures put forward in CBH's estimate of third-party contributions, with further details are provided in footnotes.[29]

The following are treated as contributions for the purpose of estimating the initial RAB:

[redacted]

III. $35.25 for capital works funded by PTA between Avon and Redmond
IV. $4.7m for Main Roads capital funding towards infrastructure renewals or upgrades at pedestrian level crossing facilities on the Arc network relates to upgrades)[31]
V. 22.5m (50% of the $45m of Government funding for upgrades to the Midland Railway line between Mingenew and Carnamah to support heavier axle loads (from 16 TAL to 19 TAL), including 77 km of track being improved through concrete sleeper replacement (with the other 50% renewal of 96 km of rail).[32]
VI. $241m (not escalated) for government funding of the narrow gauge concrete re-sleepering program initiated after the Strategic Grain Network Review (SGNR)
VII. $95m government funding for new passing loops and new rail tracks between Koolyanobbing and Kalgoorlie

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28 See page 24, Arc Consolidated Annual Report for the year ended 31 December 2024

29 That is, $54m (2008), $12m (2010), $32m (2011) which in today's dollars and allowing for exchange rate translation amounts to a total of $145m The 2010 Annual Report notes that *2011 Capital Budget Update and Other Uses of Cash* had allowed for USD146 million related infrastructure upgrades at their Koolyanobbing Mine in Western Australia (Asia Pacific Iron Ore) *Under Purchase Commitments the 2010 Report states:*

> *"During the third quarter of 2010, our Board of Directors approved a capital project at our Koolyanobbing Operation in Western Australia. The project is expected to increase the production capacity at the Koolyanobbing Operation to approximately 11 million metric tons annually. The improvements consist of enhancements to the existing rail infrastructure and upgrades to various other existing operational constraints. The expansion project requires a capital investment of approximately $254 million, of which approximately $122 million has been committed, that will be required to meet the timing of the proposed expansion. As of December 31, 2010, $22million in capital expenditures had been expended related to this commitment. Of the committed capital, expenditures of approximately $90 million and $10 million are scheduled to be made in both 2011 and 2012, respectively".*

The 2011 Annual Report states that:

> *"In 2011, the rail service provider for one of the rail lines used by our Koolyanobbing operations entered into an agreement to upgrade the existing rail line. The upgrade is being performed to enhance safety and improve functionality of the rail. The improvements include the replacement of 62 miles of rail and associated parts. As a result, our portion of the related purchase commitment is approximately $33 million for replacements and improvements to the rail structure. As of December 31, 2011, our capital expenditures related to this purchase were approximately $25 million. Remaining expenditures of approximately $8 million are expected to be made in 2012."*

30 ATN Newsletter, *Gindalbie secures rail access for its Karara Project* (August 5, 2011) Escalation figure taken from CBH submission, Table 8, p54.

31 Email communication between Main Roads Western Australia and ERA, 28 August 2025. Inclusion regardless of whether it is upgrade or renewal reflects the fact that all government contributions are to be deducted from the RAB.

32 This was part of Agricultural Supply Chain Improvements (ASCI). Note that the ERA's March report 2009 WestNet Rail's Floor and Ceiling Costs Review (p15 para 91) states that *"All operator and government contributed assets are to be included in calculating the floor and ceiling costs. An amount of the contribution determined as the equivalent annual cost will be credited to the operator and the route section(s) concerned in the calculation of the over-payment in the ceiling price test."* This approach occurred under the GRV approach to regulating, with the objective of not expected government contributions to be recovered in the revenue.

VIII. $11m government contributions for concrete re-sleepering and crossing loop extensions EGR 2007
IX. $37m signalling upgrade (Northam - Koolyanobbing)
X. $145m Cliff Natural Resources (sum of amounts identified in 31 Dember 2024 dollars by CBH)[33]
XI. $171m of government funding identified in Arc's 2024 Annual Report

RPIs assessment of the above amounts to approximately $1.4b.[34]

6 Review of Funding Costs (Interest During Construction)

Section 2.3 of Arc's Costing Principles (November 2024) states that the asset replacement cost will include provisions for funding (opportunity) costs, with these to be *"estimated by applying the WACC to a development cost curve over a realistic project development duration".* The principles state:

- *"The schedule will be developed to represent the realistic minimum duration, without being unduly rushed, that an experienced entity would require to complete the development, from project identification, through to when the entire development could earn revenue."*
- *"The profile of construction costs will be determined on the basis of a single stage project comprised of concurrent individual projects."*

This description may not result in efficient funding costs if a more pragmatic approach would involve the successive staging of component projects.

6.1 Project Development Schedule

Table 5-23 of Arc's submission presents the component durations for activities included in:

- Preconstruction planning, design, approvals and enabling works 4.8 years
- Construction works 13.3 years

This makes for a total duration of 18.1 years. This schedule is developed to represent the *"realistic minimum duration, without being unduly rushed, that an experienced entity would require to complete the project development, from project identification, through to when the entire development could earn revenue."* Arc further state that "Durations of major construction tasks are based on production rates that have been achieved in practice on recent projects for similar assets in Western Australia (i.e. comparable linear infrastructure projects). These therefore represent realistic construction rates using modern plant, equipment and methods."

RPI has identified opportunities to reduce the duration. Table 14 below lists where time has been removed from the profile for CAPEX.

33 Noting that the amounts outlined in the annual reports cited by CBH include much higher amounts for capital upgrades in their descriptions and budgeting.

34 This is close to the upper end of the estimated range put forward by CBH who put forward the midpoint of $1.3b for contributed assets.

Table 14 Reduction in the duration of the capital expenditure profile

Comparion Arc Duration Vs RPI Duration	Arc	RPI	Reduction in Duration	Notes/Comments
Arc's duration for IDC	**18.1 years**	**na**	**DiffYrs**	
Planning and approvals period	4.8 years	0 years	4.8 years	Costing Principles specify IDC only for "efficient construction and commissioning periods". AER/Ofwat/Ofgem guidance use state IDC applies only to "capital actually spent, not pre-construction planning and starts when physical construction begins and stops at commissioning.
Sub-total duration after removing planning and approvals duration	**13.3 years**			
Allowance for optimisation of asset base	nil	2 years	2 years	Optimisation of non-operational routes amounts to a reduction in track km of 814km; Routes identified as redundant by Arc Table 5-1 (2.8km) Total 816.8km (approx 15% of total track km) reduces 13.3 yrs by 15% (2 years).
Sub-total duration after reducing to reflect optimisation	**11.3 years**			
Assumed km rail corridor	10.5 years	10 years	0.5 years	Arc assume 528km pa track , with the difference of 290km saving approximatly 0.5 year construction time based on Cuttings and Embankments and Formation.
Revised Duration for IDC	**10.8 years**		**7.3**	**RPI estimates IDC based on a 11 year construction period**

The following have reduced the profile from 18.1 to approximately 11 years:

- Removal of planning and approvals period, consistent with regulatory precedents both nationally and internationally (4.8 years), along with the associated capital expenditure
- Reduction to reflect the optimisation of track km (15% of track km amounting to a 2 year time saving)
- A minor correction for the total track km allowed for by Arc (290km less amounting to 0.5 years of duration based on Cuttings and Embankments and Formation only).

6.2 Methodology for calculating funding costs

Funding costs are estimated by applying a WACC provided by the ERA for this purpose to the estimated ORC which is profiled over a duration that delivers an efficient replacement costs and related funding cost. Arc estimates the IDC to be $9.1b over the 18 year construction period, with this amounting to approximately 44% of their estimated ORC of $20.9b. RPI believes that the order of magnitude of this component of cost is excessive, largely due to the compounding of interest over a very long period.

RPI has applied the same methodology used by GHD in the *Australian Rail Track Incorporation Ltd (ARTC) 2008-09 Submission to the Independent Pricing and Regulatory Tribunal (IPART)* in respect of the Hunter Valley Regulatory Network Roll Forward Asset Base. During the 2008/09 year, ARTC identified 6 projects commissioned during the year for which financing costs had been incurred in a prior year. IDC were calculated for each of these projects and included in the Regulated Asset Base for 2008/09. The following provides a detailed example for one of these projects, *Bi-Directional Signalling Maitland - Branxton,* with RPI then applying the same methodology to the capital expenditure profile used by Arc in its submission.[35] We extend the methodology used to allow for 4 years construction periods, which we consider adequate for most project construction and commissioning periods in this sector. This has the effect of reducing the compounding of interest, so that the IDC is a lower percentage of ORC and more in line with typical ranges for other large, regulated entities.

35 These examples were set out in Appendix G, p38 of the submission. RPI has corrected the figures for small numerical errors.

Rate of Return	7.30%				
	2007-08	2008-09	2009-10	2010-11	2011-12
ARTC Example 1, App G, p33	**Yr 1**	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**
CAPEX ('000)	$1,285	$43,663			

Yr 1	$47	$75			
Yr 2		$1,274			
Yr 3					
Yr 4					
Yr 5	$0	$3			
Previous Year Interest Capitalisation	**$47**	**$1,352**			

Commissioning Month/Year	May-09
Proportion of final year for IDC	0.8

Yr 1	Interest on the CAPEX during the year is calculated using the Rate of Return as a proxy for the cost of financing during construction. To reflecIt the spread of cashflows over the entire year, the interest is calculated on 50% of CAPEX during the year. i.e. Yr 1 CAPEX $1,285k x 50% x 7.3% = $47k
Yr 2	In Yr 2 of CAPEX, interest is calculated on 100% of the CAPEX in the prior year, as well as 50% of the CAPEX in the current year, as well as the capitalised interest from the prior year. In the year of commissioning, the interest cost on the preceding years financing costs is calculated for eachmonth up to the end of the month prior to the actual commissioning of the project. i.e Yr 1 CAPEX $1,285k x 100% x 7.3% x 0.8 = $75K Yr 2 CAPEX $43,663k x 50% x 7.3% x 0.8 = $1,274 Yr 1 interest $47k x 7.3% = $3k
Total Interest During Construction	$1,399k (equal to 3.1% of CAPEX $1,285k + $43,663k)

Figure 4 Worked example for IDC Cost - extract from GHD's ARTC 2008-09 Submission IPART[36]

6.2.1 Arc's Replacement Construction Cost profile

Figure 5 (Figure 5-5 of Arc's submission) presents an optimised replacement cost of $20,913m across a development schedule of 229 months (as per the axis in figure 5.5, with 229 months approximately 19 years). This ORC is estimated by adding Planning and Design Costs, Planning and Development Consent Costs, Corporate and Other Costs amounting to $3,846.0m to the optimised construction costs of $17,067.0m (see Table 5-25 of Arc's proposal).

[36] Source: *GHD ARTC 2008-09 Submission to the Independent Pricing and Regulatory Tribunal (IPART).* GHD in the Australian Rail Track Incorporation Ltd (ARTC) 2008-09 Submission to the Independent Pricing and Regulatory Tribunal (IPART) in respect of the Hunter Valley Regulatory Network Roll Forward Asset Base. During the 2008/09 year, ARTC identified 6 projects commissioned during the year for which financing costs had been incurred in a prior year. IDC were calculated for each of these projects and included in the Regulated Asset Base for 2008/09. The above extract provides a detailed example for one of these projects, Bi- Directional Signalling Maitland - Branxton, with RPI then applying the same methodology to the capex profile used by Arc in its submission. These examples were set out in Appendix G, p38 of the submission. RPI has corrected the figures for small numerical errors.

Figure 5-5 of Arc's submission shows this ORC spread over 229 months.

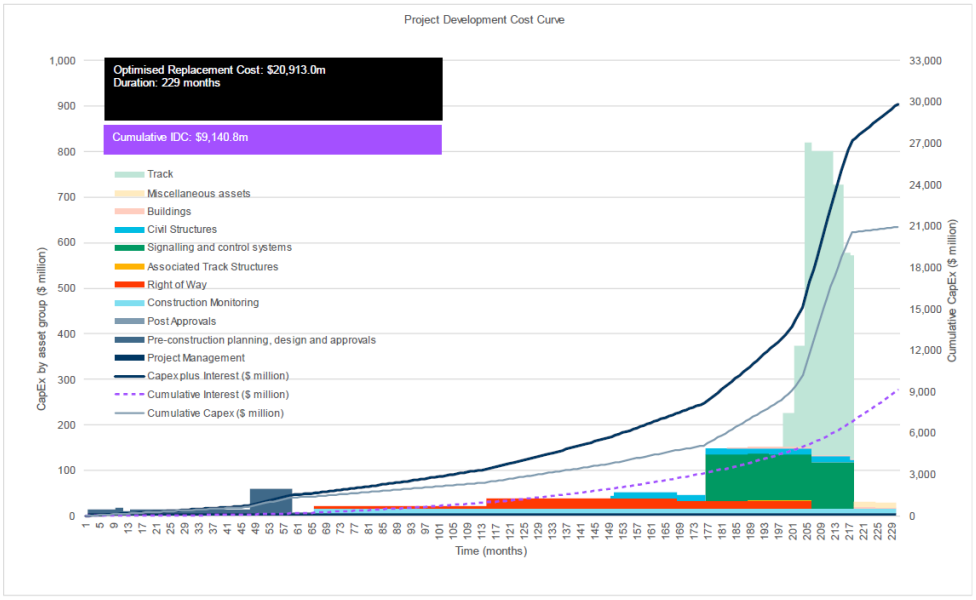

Figure 5 Arc's capital expenditure profile used to estimate funding costs

The duration for the capital expenditure profile has a significant impact on the IDC estimates. It is important to ensure that the duration used reflects regulatory precedents so that the most efficient construction period is adopted. Regulatory precedent suggests that acceptable expenditure for estimating the funding costs excludes expenditure associated with pre-construction planning and commences when physical construction begins and stops after commissioning. Table 14 above compares the impact of these changes and allowing for the effect of optimisation on the duration of capex.

In addition to reducing the duration of the capital expenditure profile, RPI makes the following changes:

I. Removes contributed assets from the ORC on which funding costs are based
II. Applies an assumption that 4-year construction and commissioning periods will be used across the 11-year duration. After each 4-year project is commissioned, funding costs move from being capitalised to being expensed and recovered through revenue.
III. Apply a greater proportion of the total capex to the middle years to reflect a more realistic construction profile as opposed to Arc's profile which has 72% of the total capex occurring during the last four years.

We use annual capital expenditure figures to estimate the IDC as there is not a lot to be gained in using monthly data for this estimate given its purpose and assumptions required (assuming the correct annual and corresponding monthly interest rates are used).[37] RPI notes that GHD have used a monthly rate equal to .006216 (i.e. 7.46/12) instead of the correct rate of 0.006014 based on $(1+7.46)^{1/12}$ -1. Failure to allow for the compounding of the monthly rate means that a relatively higher monthly interest rate is being used, resulting in a relatively higher IDC value.

37 Over 229 months, the total compounded growth for $1 capital expenditure is $(1+ 0.006014)^{229} – 1 \sim 3.947495 - 1$ to make for a total compound growth of 295% or gain of 2.95 x $1. The effect of using the incorrect monthly rate is approximately equal to $(1+0.006216)^{229} – 1 \sim 4.133853 – 1 = 3.133853$. That is, compounded over 229 months, $1 becomes 4.13 x $1, a gain of 3.13 x $1.

6.2.2 Pre-tax vs Post-tax WACC

Stakeholders submitted that the ERA should consider whether use of a real pre- or post-tax WACC is appropriate for use in the calculation of funding costs. RPI agrees that a post-tax WACC is justified so that the financing cost estimate is consistent with the allowed return regime.

The regulatory approach used in determining the total costs and incremental cost when undertaking the Schedule 4 assessment of an access proposal will apply a real pre-tax WACC to the initial regulated asset base. The real pre-tax WACC modelling of future revenue requirements applies a real pre-tax WACC to calculate the return on assets. The building block cashflows do not include an explicit provision for tax because it is included in the grossed-up real pre-tax WACC and is therefore implicitly reflected in the return on assets building block rather than as an explicit building block under a post-tax calculation of revenues. This regulatory task did not determine regulatory assets and cash flows, and therefore accounting for tax in a forward revenue building blocks was not required.

Where the tax implications (imputation credits, tax allowance) are handled separately in determining the revenues required to achieve NPV equivalence (i.e. equivalence of costs and revenues over time), applying a post-tax WACC in determining the initial regulated asset base will ensure that users are not charged twice for the tax effects on funding costs.[38] This is because the pre-tax WACC effectively escalates the return on equity to compensate for there not being a tax shield (i.e. post-tax WACC/(1-t) where t is the effective tax rate). Users will therefore be paying twice through the return on these "higher" funding costs based on a pre-tax WACC and through the cashflows for tax in future years.

The CBH submission has clearly expressed the issue:

> *"CBH submits that use of a pre or post tax WACC will depend on how ceiling costs are calculated. If under the DORC methodology the building block model produces a tax allowance, the real post-tax WACC of 6.22% should be used. Using a pre-tax WACC (which includes a tax burden uplift) in a building block model where an explicit tax allowance is already calculated as part of allowable revenue, would overcompensate Arc by double-counting tax compensation (para 299)."*[39]

Table 15 shows the annual capex figures and subsequent interest during construction (IDC) costs (funding costs) during successive 4-year construction periods with these confined to the same column for illustration purposes. The highlighted cells (blue) denote subsequent years in the same construction period. This logic is applied across the entire capex profile to estimate the ICD for the full ORC. This enhances transparency, allowing the cost associated with each component of capital expenditure to be identified in a single column.

We note that the Costing Principles state that the capital expenditure is assumed to occur mid-year, with this expenditure multiplied by the WACC to estimate funding costs.

The Replacement Cost Approach (DORC/ORC) estimates the Cost to replace the asset in today's efficient terms, using unit rates × quantities. It is a snapshot at the valuation date, with no staging or time discounting. Unit rates are already expressed in valuation date dollars. IDC or funding costs are added separately because funding costs are not included in the base unit rates. RPI has estimated IDC costs by applying the costing principles to a S-curve.

6.2.3 Depreciation of IDC costs

The estimated funding costs are then depreciated to reflect the remaining life of the network. RPI applies the average remaining life for each route section on a per track km basis to the estimated IDC.[40]

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38 This is context specific, so that in setting revenues (based on efficient costs) a tax building block is included so that in negotiations between ARC and access holders or access seekers, everyone understands that there is a tax cost bucket because tax is not indirectly included in a rate of return.

39 CBH submission on Arc Infrastructure's statement of the depreciated optimised replacement cost and statement of the depreciation schedule published on 16 June 2025, Paragraph 299 p. 42.

40 For example, assuming:

Post-commissioning, the regulatory treatment is such that once in the RAB:

- the total capitalised cost (including IDC) becomes subject to depreciation over the economic life of the asset and
- the regulator also allows the asset owner to earn a return on the undepreciated portion of the RAB, via the Weighted Average Cost of Capital (WACC).

In this way, the IDC is not separately amortised, but rather is implicitly amortised as part of:

- Depreciation of the asset (return of capital), and
- WACC-based return on RAB (return on capital).

- Construction cost: $100DC: $10M

The total capitalised cost is $110M, Assuming an economic life: 40 years and WACC of 6%, then annually: Depreciation: $110M ÷ 40 = $2.75M/year (straight line)

- Return on RAB (first year): 6% × $110M = $6.6M

The total allowed revenue in Year 1 = $9.35M

Table 15 Estimation of Funding Costs

Estimation of Funding Costs																				
Assumptions																				
ORC used by Arc	$20,913m																			
ORC used by RPI (excl contributed assets)	**$16,852m**																			
Post-tax real WACC[a]	6.22%																			
Construction Periods	4 years																			
Period		**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**
		Yr 1	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**	**Yr 6**	**Yr 7**	**Yr 8**	**Yr 9**	**Yr 10**	**Yr 11**	**Yr 12**	**Yr 13**	**Yr 14**	**Yr 15**	**Yr 16**	**Yr 17**	**Yr 18**	**Yr 19**
Mid-yr Discount Rate (PVIF)		**1.0000**	**0.9647**	**0.8977**	**0.8354**	**0.7774**	**0.7234**	**0.6732**	**0.6265**	**0.5830**	**0.5425**	**0.5048**	**0.4698**	**0.4372**	**0.4068**	**0.3786**	**0.3523**	**0.3278**	**0.3051**	**0.2839**
Capex Profile used by Arcto estimate IDC	**$20,913**	**$168.6**	**$169.0**	**$163.7**	**$253.9**	**$603.2**	**$198.4**	**$250.4**	**$250.4**	**$250.4**	**$376.0**	**$465.8**	**$465.8**	**$557.6**	**$608.6**	**$1,054.1**	**$1,804.1**	**$3,374.0**	**$8,968.7**	**$930.0**
(1) Annualised CAPEX	**$16,852**	**$135.9**	**$136.2**	**$131.9**	**$204.6**	**$486.1**	**$159.9**	**$201.8**	**$201.8**	**$201.8**	**$303.0**	**$375.3**	**$375.3**	**$449.3**	**$490.4**	**$849.4**	**$1,453.8**	**$2,718.8**	**$7,227.1**	**$749.4**
(2) Remove the planning and approvals capex and related duration - first 5 years (removing both duration 4.8 yrs and capex $615 m)		**$159.9**	**$201.8**	**$201.8**	**$201.8**	**$303.0**	**$375.3**	**$375.3**	**$449.3**	**$490.4**	**$849.4**	**$1,453.8**	**$2,718.8**	**$7,227.1**	**$749.4**					
CAPEX over 14 yrs (13.3 yrs)		**1%**	**1%**	**1%**	**1%**	**2%**	**2%**	**2%**	**3%**	**3%**	**5%**	**9%**	**17%**	**46%**	**5%**					
(3) Allow for impact of optimisation on duration (less 2 years). Optimisation already reflected in the ORC. (4) Adjust for different track km to Arc's assumption of 5,560 (i.e. 0.5 yr less required)	**(3) and (4) Reduce duration 2.5 yrs**																			
CAPEX over 11 yrs	**$15,757**	**$315.1**	**$472.7**	**$709.1**	**$709.1**	**$1,260.6**	**$2,048.4**	**$2,206.0**	**$2,363.6**	**$2,363.6**	**$2,206.0**	**$1,103.0**								
		2.00%	**3.00%**	**4.50%**	**4.50%**	**8.00%**	**13.00%**	**14.00%**	**15.00%**	**15.00%**	**14.00%**	**7.00%**	**(revised profile)**							
Application of Costing Principles s2.3																				
WACC*CAPEX*0.5(assuming mid-year)		**$9.8**	**$14.7**	**$22.1**	**$22.1**	**$39.2**	**$63.7**	**$68.6**	**$73.5**	**$73.5**	**$68.6**	**$34.3**								
WACC*CAPEX (full year 100%) from years 2 to 5[b]																				
Yr **1.0**		-	-	-	-	-	-	-	-	-	-	-								
Yr **2.0**		$19.6	$29.4	$44.1	$44.1	$78.4	$127.4	$137.2	$147.0	$147.0	$137.2	$68.6								
Yr **3.0**		$19.6	$29.4	$44.1	$44.1	$78.4	$127.4	$137.2	$147.0	$147.0	$137.2	$68.6								
Yr **4.0**		$19.6	$29.4	$44.1	$44.1	$78.4	$127.4	$137.2	$147.0	$147.0	$137.2	$68.6								
Compounded interest over remainder of loan period (debt amount x interest rate)[n]																				
Yr **1.0**		-	-	-	-	-	-	-	-	-	-	-								
Yr **2.0**		$0.6	$0.9	$1.4	$1.4	$2.4	$4.0	$4.3	$4.6	$4.6	$4.3	$2.1								
Yr **3.0**		$1.2	$1.8	$2.7	$2.7	$4.9	$7.9	$8.5	$9.1	$9.1	$8.5	$4.3								
Yr **4.0**		$1.2	$1.8	$2.7	$2.7	$4.9	$7.9	$8.5	$9.1	$9.1	$8.5	$4.3								
TOTAL for YR (not discounted)	**$3,582.7**	**$71.7**	**$107.5**	**$161.2**	**$161.2**	**$286.6**	**$465.8**	**$501.6**	**$537.4**	**$537.4**	**$501.6**	**$250.8**								
Percentage of ORC	**21%**																			

a Source: Determination on the 2024 weighted average cost of capital for the freight and urban railway networks, and for Pilbara railways (p4)
b Note that for presentation purposes, the cells highlighted blue refer to subsequent years in the assumed loan period (construction period) for the CAPEX profile.

Insights from the above table include:

- The duration period of 11 years where projects are constructed over four-year periods results in a funding cost of $3,583m (21% of the total ORC less contributions).[41]

This is higher than a typical IDC based on real costs for capital upgrades for below-the-line rail (i.e. 6-10%), as it is calculated for the entire network over a much longer duration. Note that GHD's estimate of IDC costs for ARTC in 2019 used a real, pre-tax WACC of 4.37% which was determined by the ACCC. Their estimate of funding costs amounted to 17% of the ORC i.e. ORC (i.e. $3,066.1m as a percentage of $17,912m).

We note that the methodology used here does not reflect the financial benefit (lower cost) associated with starting construction in year 6 rather than year 1. On this basis, there may be justification for some adjustment of the amount incorporated into the iRAB to allow for this.[42]

The revision to this component of the DORC reduces the estimate of $9,140.8m to $3,583m, a reduction of $5,558m (a reduction of 61%).

7 Review of Accumulated Depreciation

The assessment of accumulated depreciation for a DORC is based on remaining service potential of the existing assets at the valuation date, along with consideration of factors warranting acceleration or deceleration from the straight-line (SL) approach. This recognises that a proportion of any life-extending investments in the assets may also have been recovered.

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

> *"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 Economic Life of the asset based on the current physical condition of the asset and forecast rate of consumption.*
>
> *Upon determining the Economic Life of the asset, the Railway Owner will compare the Economic Life of the asset to the Standard Design Life and reduce the optimised replacement cost for that asset proportionally."*

Depreciating the optimised replacement construction cost is an important step, as decisions around acceleration or deceleration of depreciation can be used to ensure that Regulator is able to meet the objectives of the *Railways (Access) Act 1998:*

> *"establish a rail access regime that encourages efficient use of and investment in railway facilities by facilitating a contestable market for rail operators".*

Section 47(K) of the Code states that the depreciation schedule submitted to the regulator must show depreciation for each asset or asset group and this is to be distributed uniformly or otherwise. The asset must only be depreciated once, such that the sum of the return of capital (i.e. asset consumption/depreciation) over the asset's economic life is not

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41 Because the values in Table 15 are constructed based on compounded interest payments over a defined construction period (4 years), the resulting values are already in present value dollars, therefore discounting is not required. However, if the annual capital expenditure cashflows were time value adjusted (e.g. some form of annuity or annual equivalent which has a real rate built into it), discounting would be required.

42 This would be akin to the financial benefit that is associated with deferred capital expenditure in other contexts and can be estimated by multiplying the estimated funding cost by the relevant discount factor. For example, if discounting for five periods from year 6 to year 1, the estimated funding cost would be multiplied by a Present Value Interest Factor of $1/(1+WACC)^5$. Using the same post-tax real WACC of 6.22%, this factor would equal 0.7622 using mid-year discounting and 0.7396 using end-of-year discounting.

greater than the value of the asset at the time it was first included in the regulatory asset base. In addition to this requirement, there is scope to subjectively vary the depreciation rate so that "access prices will vary over time in a way that promotes efficient growth in the market for rail access; and, more specifically:

> *"s47 (K) (e) allows, as far as reasonably practicable, for adjustments that reflect changes in the expected economic life of a particular asset or group of assets; and*
>
> *s47 (K) (f) allows for the legitimate business interests of the railway owner, access seekers and access holders."*

The Costing Principles require the Railway Owner will provide the Regulator with all supporting material necessary for the Regulator to meets its obligations under section 47K in the evaluation of the Railway Owner's depreciation schedules. This material will include:

- asset commissioning date
- asset condition information (using an accepted sampling approach) and
- information on variations of performance from given design life, including explanations, and renewal work which may have extended the asset life.

Figure 6 below illustrates the various factors to be considered in estimating depreciation.

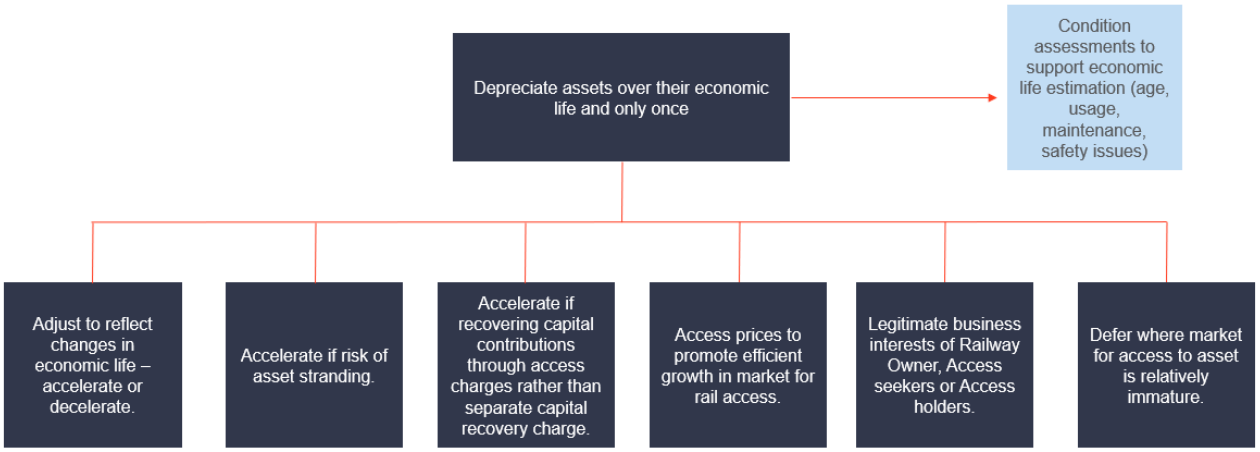

Figure 6 Factors to consider in estimating depreciation

To fully carry out its functions under *Railways (Access) Act 1998* or the Code when making determinations, Section 20 (4) of this act states that the regulator must take into account:

> *"(a) the railway owner's legitimate business interests and investment in railway infrastructure;*
> *(b) the railway owner's costs of providing access, including any costs of extending or expanding the railway infrastructure, but not including costs associated with losses arising from increased competition in upstream or downstream markets;*
> *(c) the economic value to the railway owner of any additional investment that a person seeking access or the railway owner has agreed to undertake;*
> *(d) the interests of all persons holding contracts for the use of the railway infrastructure; firm and binding contractual obligations of the railway owner and any other person already using the railway infrastructure;*
> *(f) the operational and technical requirements necessary for the safe and reliable use of the railway infrastructure;*
> *(g) the economically efficient use of the railway infrastructure; and*
> *(h) the benefit to the public from having competitive markets."*

The Railways (Access) Amendment Code 2023, under Section 47C (Definitions in Code 2000) specifically requires:

> *"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."*

Arc's approved Costing Principles require that:

- The standard design life (MEA) for each asset class be used in calculating the DORC
- The accumulated depreciation be calculated as the portion of the MEA life already consumed (such that an asset with 30% of its design life remaining will have accumulated depreciation at 70% of replacement cost).
- Therefore, longer design lives translate to lower initial depreciation and lower ongoing depreciation for the same service life.

In resetting the ARTC Interstate RAB using a DORC approach (July 2019 DORC), the ACCC saw GHD (ACCC's consultant) optimise at the asset level so the MEA "embodies improvements in materials and build technology" and make "further depreciation adjustment… if the life or capacity of the MEA is different to the life or capacity of existing assets." In the same report, depreciation is explicitly based on asset life for the MEA, not legacy assets' historic lives. In practice this meant using MEA lives (e.g., concrete sleepers and modern track forms) rather than legacy timber lives and aligning regulatory depreciation to those longer MEA lives in the RAB. The QCA endorsed component-specific lives longer than accounting lives, meaning accumulated depreciation at valuation was lower under Aurizon Network UT5. That resulted in lower initial write-downs and longer recovery periods under roll-forward. A longer life will mean a lower annual straight-line depreciation charge going forward, which keeps the RAB higher in earlier years.[43]

Arc have reduced the new replacement cost (ORC) in proportion to the remaining Economic Life of the existing assets, where economic life reflects the period of an asset's usefulness for its owner, or the period over which the Railway Owner intends to recover the investment.

Based on the above regulatory precedents, RPI has adopted the MEA life of 50 years for sleepers, such that the depreciation is relatively lower based on remaining life being relatively longer. However, based on instruction from the ERA, we have considered contributed assets at a route section level and have deducted these from the ORC before depreciation is applied. This approach differs to that adopted by the ACCC in relation to the treatment of contributed assets:

> *"The ACCC considers that where government grants have contributed to discrete and separable assets, these may be able to be excluded from the RAB following the DORC revaluation. Where government grants have contributed to non-separable and indivisible assets, these assets will likely need to be included in the RAB as it will be difficult to distinguish between what proportion was, and was not, funded by government grants."*

We have also considered changes to Straight Line (SL) depreciation (i.e. acceleration or deceleration) based on five of the six possible reasons illustrated in Figure 6. These are explained in the relevant sections below.

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[43] This is typically calculated as:
Depreciation proportion=Age of existing asset / Design life of MEA
If the MEA has a longer design life, the depreciation proportion will be smaller for the same asset age, which means the asset is considered to have *more* remaining life and therefore a higher remaining value in the initial RAB. For example, if timber sleepers have a design life of 15 years are 50% consumed, substituting with the MEA using concrete sleepers with a design life of 50 years will mean a smaller life consumed (or higher life remaining). For example:
- Timber sleeper design life: 15 years; age: 7.5 years → 50% life consumed.
- Concrete sleeper MEA design life: 50 years; age: 7.5 years → 15% life consumed.

Under the MEA substitution, the DORC value would be higher because less of the "new asset" life is considered used up.

7.1 Arc's approach to depreciation

Arc sets out the remaining life assumptions by asset class (e.g., track, signals), noting that the economic life is the duration an asset is expected to generate revenue efficiently and reliably for the service it was designed for, assuming appropriate and industry good practice maintenance takes place.

We note that the standard design lives are consistent with those set out in Appendix 2 in the Costing Principles. Arc proposal adopts a "tiered approach" to measuring depreciation, to suit the availability of installation date, average age of the relevant assets in the same Network Group or the average age of the relevant asset across the Arc Network. A minimum remaining life of 10% was assumed for any in-service assets that are at or beyond the end of their useful life. This practice follows regulatory precedent.

While Arc states that it fully depreciated any non-operational routes, RPI notes that the modelling provided had these routes included in the depreciation tables. We do not include such routes in our depreciation estimates as all non-operational routes were optimised. GHD's modelling estimates depreciation factored on ORC values based on CRC + Optimization + Conventional Procurement.[44] Table 16 below lists the accumulated depreciation by asset type in Arc's proposed DORC followed by some high-level insights.

[44] Optimization includes the following factors: Track length removed, Cost reduction from loop length reduction, Cost reduction from section removal, Supply Inc. Locality Loading, Install Locality Loading, Contractor Risk Allowance, Contractor Preliminaries and Contractor Overheads. Conventional Procurement includes the following factors: Project Management – Supply, Project Management – Install, Construction Management, Planning and Design, Corporate and Other costs, Planning and Development Costs and Interest.

Table 16 Arc's Depreciation of ORC by asset type

Depreciated Optimised Replacement Costs by Asset Type - Arc's estimate by asset type			
Asset MEA	**ORC**	**Depreciation**	**DORC**
Right of Way			
Access Roads	3,951.40	-538.8	
Sub-total	**3951.4**	**-538.8**	**3,412.60**
Civil Structures			
Bridges	845.10	-553.10	292.00
Tunnels	111.60	-64.40	47.2
Culverts	504.80	-186.70	318.1
Sub-total	**1,461.50**	**-804.2**	**657.30**
Track			
Rail	10,301.90	-5,123.30	5,178.60
Sleepers	3,743.10	-2,072.30	1,670.80
Ballast	1,838.00	-492.2	1,345.80
Turnout	757.40	-390.4	367.00
Sub-total	**16640.4**	**-8078.2**	**8,562.20**
Signalling and Communications (Tabl	7,450.00	-5014.7	2,435.30
Sub-total	**7450**	**-5014.7**	**2,435.30**
Buildings			
Centralised Control Centres	14.30	-3.60	10.7
Maintenance Facilities	213.60	-147.40	66.2
Depots	24.00	-18.10	5.9
Sub-total	**251.90**	**-169.1**	**82.80**
Associated Track Structures	61.90	-27.40	34.50
Sub-total	**61.90**	**-27.4**	**34.50**
Miscellaneous			
Plant, tools and Equipment	101.00	-73.60	27.50
Signage	14.10	-8.90	5.20
Walkways	121.90	-46.20	75.60
Sub-total	**237.00**	**-128.7**	**108.30**
TOTAL	**$30,054**	**-$14,761**	**$15,293 (excludes opex savings $30m)**

High-level insights include:

- Track assets account for 49% of the total accumulated depreciation
- Signalling and Communications assets account for 34% of accumulated depreciation
- Arc's depreciation estimate does not include depreciation on funding costs (reference 6.2.3 above)
- Arc's depreciation estimate does not allow for any variation from straight-line SL depreciation

Combined, these two asset categories account for 83% of the total accumulated depreciation. By not depreciating funding costs, users may pay twice to the extent that the network has been used over time. Any comparisons made on depreciation must bear in mind this difference.

7.2 RPI's approach for reviewing accumulated depreciation

RPI has determined the accumulated depreciation for the network by applying the composite depreciation rates to the total ORC plus funding costs less contributed assets at each route section and summing these amounts. To determine the relevant composite depreciation rate for each route, the following steps were taken:

i. Estimated the depreciation rate for each asset group based on available age using the data base provided in Arc's model for each of the assets and their age within each asset group. This was done across the network.
ii. We applied these depreciation rates for each asset group to the CRC for that asset group at a route section level. For example, for a particular asset group, if the network was comprised of two assets each costing $10m, with type 1 asset having a 50% depreciation and type 2 asset having a 10% depreciation, the weighted average depreciation is equal to 30%. This weighted average depreciation rate is applied to the CRC value to that asset group.
iii. We do this for each asset group and summed up the total depreciation at a route section level to determine the composite depreciation rate for that route section (i.e. depreciation/CRC).

Where there was insufficient data available, RPI have adopted ARC's assessment for depreciation. Across all asset groups, RPI maintained the depreciation rate for all groups except Access Roads, Bridges, Culverts and Sleepers. These differences were due to the different approach outlined above. In certain other cases following the 80/20 Pareto principle, RPI have adopted ARC's depreciation on assets which hold a significantly smaller ORC value, thereby focusing on higher-value assets.

RPI depreciated assets groups based on the data available (i.e. year installed, count, $value). For example, if 100 bridges existed for which we are sure 70 were installed in 1950, we assume all 100 were installed in 1950. That is, these bridged would be 75 years old (2025 minus 2050) and are therefore 75% depreciated (based on bridges possessing a life span of 100 years). We believe this is a more accurate way to estimate depreciation across the network compared with the approach used in Arc's proposal where for situations where asset age and condition data is not available, GHD adopt the average remaining life across all assets (i.e. bridges and culverts) on each route section.

While Arc's age data for sleepers was more comprehensive than that for bridges and culverts, RPI's depreciation rate differed due to using an MEA of concrete sleepers, as opposed to Arc's approach of a weighted average depreciation across the three sleeper types.

Table 17 lists the depreciation rates by asset group used by Arc and RPI and provides an explanation for differences.

Table 17 Depreciation rates by Asset Type- Arc Vs RPI

Depreciation rates by Asset Type - Arc Vs RPI				
Asset Type	**Deprecn Rate Arc**	**Deprecn Rate RPI**	**Difference**	**Explanation**
Formation	0%	0%	0%	Seems reasonable
Access Roads	51%	0%	51%	Assuming all maintenance works on A Rds will cover any asset life extensions and thus covered in operational works. Therefore no depreciation accounted for.
Earth Works	0%	0%	0%	Seems reasonable
Clearing and Grubbing	0%	0%	0%	Seems reasonable
Bridges	65%	54%	11%	Based on the bridges data available, we used a weighted average based on year installed vs count and applied it for the entire network. It seems unreasonable to apply an average for entire route network if there is insufficient data to base that on (for instance one dataset available).
Tunnels	58%	58%	0%	ARC's approach for tunnels uses data on bridges for those respective route networks. Due to insufficient data, RPI have accepted ARC's logic
Culverts	37%	24%	13%	Based on the culverts data avilable, we used a weighted average based on year installed vs $ORC and applied it for the entire rail network.[a] It seems unreasonable to apply an average for entire route network if there is insufficient data to base that on (for instance one dataset available). Noting RPI have excluded two datasets which suggest the culverts were installed in the year 1010.
Level Crossings	44%	44%	0%	ARC's approach for Level Crossings uses weighted depreciation on the route sections based on the available data for other asset groups. Due to insufficient input on existing structures, RPI have accepted ARC's approach.
Sleepers	55%	39%	16%	Based on weighted length*DL by type*year proportioned across the entire network based on the data available. Depr is ~38.5% based on the weighted assessment
Rail	50%	50%	0%	RPI Accept ARC's depreciation methodology adopted using the mid-range rem life assessment.
Ballast	9%	9%	0%	RPI appreciate ARC's assessment on Depreciation
Turnouts	52%	52%	0%	RPI accept ARC's depreciation methodology adopted on Turnouts based on the installed years and design life
Signals	67%	67%	0%	Currently adopting ARC depr value and OLD RPI $-values.
Control Centres	25%	25%	0%	Based on limited info, and smaller proportion ORC compared to total sum, RPI have adopted ARC's depreciation values
Maintenance Facilities	69%	69%	0%	Based on limited info, and smaller proportion ORC compared to total sum, RPI have adopted ARC's depreciation values
Depots	75%	75%	0%	Based on limited info, and smaller proportion ORC compared to total sum, RPI have adopted ARC's depreciation values
Platforms	0%	0%	0%	Not assessed
Plant & Equipment	73%	73%	0%	Cannot assess based on life. Would ideally be judged based on condition of assets. Based on limited info, and smaller proportion ORC compared to total sum, RPI have adopted ARC's depreciation values (which in this case is ~72.8% across entire list of P&E).
Walkways	38%	38%	0%	Assuming walkways are physical structures such as steel walkways which would require replacement and not covered by operational maintenance.
Signage	63%	63%	0%	Would ideally be judged based on condition of assets. Based on limited info, and smaller proportion ORC compared to total sum, RPI have adopted ARC's depreciation values

a This allows for a $1m bridge built in 1950 (which yields very little depreciation despite being very old) as well as a $50m bridge built in 2024 (which yields bigger depreciation despite being very new). RPI's approach acknowledges both the year built and the value of each bridge.

The estimated depreciation for the ORC (including funding costs) is equal to $8,579m, with an additional amount related to acceleration of depreciation of $3,320m making a combined depreciation of $11,899m, down up from $14,761m (approximately a 20% reduction). Note that Arc's estimate for depreciation does not allow for depreciation of funding costs, so its depreciation would otherwise be higher than their estimate of $14,761m.

Table 18 applies the different asset group depreciation rates to each asset group to determine the depreciation based on the RPI's CRC estimate. This highlights the difference between Arc and RPI's accumulated depreciation for this aspect.

Table 18 Depreciation based on RPI CRC – Arc Vs RPI depreciation rates

Depreciation based on RPI CRC - Arc Vs RPI depreciation rates by asset type				
Asset Type	**RPI's CRC**	**Depreciation using Arc's depreciation rates**	**Depreciation using RPI's depreciation rates**	**Difference**
Formation	$1,677m	$0m	$0m	$0m
Access Roads	$950m	$488m	$0m	$488m
Earth Works	$18m	$0m	$0m	$0m
Clearing and Grubbing	$54m	$0m	$0m	$0m
Bridges	$537m	$352m	$291m	$61m
Tunnels	$64m	$37m	$37m	$0m
Culverts	$782m	$289m	$191m	$98m
Level Crossings	$39m	$17m	$17m	$0m
Sleepers	$1,842m	$1,020m	$709m	$311m
Rail	$5,706m	$2,838m	$2,838m	$0m
Ballast	$1,865m	$169m	$168m	$1m
Turnouts	$456m	$235m	$235m	$0m
Signals	$4,167m	$2,805m	$2,805m	$0m
Control Centres	$25m	$6m	$6m	$0m
Maintenance Facilities	$124m	$85m	$85m	$0m
Depots	$14m	$10m	$10m	$0m
Platforms	$0m	$0m	$0m	$0m
Plant & Equipment	$62m	$45m	$45m	$0m
Walkways	$70m	$27m	$27m	$0m
Signage	$8m	$5m	$5m	$0m
Sub-total	**$18,461m**	**$8,429m**	**$7,470m**	**$959m**

Key insights from this table include:

- The different depreciation rates for each asset type account for a $959m difference when applied to RPI's indicative CRC estimates by asset type. Note this excludes Owner's Costs and Funding Costs.

Table 19 then subtracts the above accumulated depreciation based on the estimate CRC to determine depreciation associated with other factors, namely optimisation, contributed assets and funding costs and finally acceleration.

Table 19 Factors explaining total depreciation – Arc Vs RPI

Factors explaining total depreciation - Arc Vs RPI		
Factors driving depreciation	**Accum Deprecn - Arc**	**Accum Deprecn - RPI**
Total Depreciation (pre-acceleration)	$14,761m	$8,579m
Difference to CRC Depreciation (pre-acceleration *(see Table 19)*	$6,332m	$1,109m
Percentage Total Depreciation related to optimisation, contributed assets and funding costs.[a]	43%	13%
Accelerated depreciation	$0m	$3,320m
Difference to CRC Depreciation (post-acceleration) *(see Table 19)*	$6,332m	$4,428m
Percentage Total Depreciation related to optimisation, contributed assets, funding costs and acceleration.[a]	43%	37%

a Note that Arc's proposal does not depreciate funding costs.

High level insights include:

- Based on this comparison, 43% of Arc's total depreciation would be related to the impact of optimisation (as Arc do not have contributed assets, nor do they depreciate funding costs)
- In contrast, 13% of RPI total depreciation estimate relates to the impact of optimisation, contributed assets being excluded and funding costs being depreciated.
- Arc do not accelerate depreciation on any routes, whereas RPI has done so based on trending significant declines in rail freight. When acceleration is considered, 37% of the total depreciation is accounted for by a mix of optimisation, contributed assets, fundings costs and acceleration. This means that 24% (i.e. 37% less 13%) is due to acceleration of depreciation from SL acceleration.

By adopting the remaining lives by asset group and applying these across and RPI's revised ORC values based on the compilation of asset CRCs for each route section, the depreciation amounts to approximately 42%. When accelerated depreciation is added to this estimate, the total depreciation amounts to approximately 59% of the estimated ORC less contributions (including funding costs). Arc's depreciation amounted to approximately 49% of this same figure (noting depreciation for funding costs was not included).

7.3 RPI's Assessment of changes to SL Depreciation

Section 20 of the Railway (Access) Act 1998 sets out the factors the ERA must consider when making determinations, with adjustments to straight-line (SL) depreciation possible where it allows the objectives of the Act to be achieved. Depreciation has different implications for the IRAB valuation (i.e. reduces the asset base on which returns are earned) and subsequent RAB roll-forwards (i.e. adds to the revenues required to cover asset consumption). In the current context where we are estimating the IRAB, we consider acceleration of depreciation as a means of reducing the amount of costs recovered from access holders and access seekers. This would increase the contestability within the freight sector and where relevant, allow for the appropriate allocation of stranding risks driven by demand uncertainties, risks of climate change and policy changes arising from it.

Another justification for accelerating depreciation is where the Railway Owner has recovered capital contributions through access charges rather than separate capital recovery charges [redacted]

7.3.1 Stakeholder interests and market outcomes

This section uses the GTK data by route section which the ERA may consider in addressing factors outlined in Section 20 of the Act. Without doing so, it is possible that there may be pricing and investment decisions by the Railway Owner and Access Seekers that are not efficient. For example, more detailed market and policy considerations identifying trends will ensure that there are appropriate incentives for rail infrastructure owners and access seekers to make efficient investment in, use, and operation of the rail assets (encouraging efficient modal choices).

We note though the current policy environment aimed at addressing the trend toward to road freight to consider safety, road costs and other externalities could impact on the underlying assumptions on which BITRE would have based their forecasts.

RPI has analysed the GTK data for route sections from 2015 to 2024 which was provided by Arc. We have analysed this data to observe changes and trends that may have commercial implications for either the Railway Owner, the Access Holders or potential access users, as well as the broader economy. Table 20 below (extends over three pages) lists the proportion of the total tonnages from 2015 to 2024, the CAGR across those years, the annual growth across one-, three- and five-years as well as percentage changes across one-, three- and five-years. The table only shows those routes for which GTK were included in the data provided to the ERA following the Section 21(1) notification. Cells highlighted refer to cessations (yellow), commencement (blue) or a combination of both (green). While we focus on the actual 5-year trends against the 10-year historical demand, we note that these “notable changes” indicate those routes where there is more variability in freight demand.

Table 20 Historical GTK date and growth/decline in GTK volumes by route section

Historical GTK Data and Growth/Decline in Volumes (Selected Routes)											
Route Section UID	2015	2024	TOTAL GTK 2015-2024	Proportion of total GTK 2015-2024	CAGR 2015-2024	Growth 1-yr	CAGR 3 yr	CAGR 5-yr	Percentage Change 3 yr	Percentage Change 5 yr	Acceleration of SL Depreciation
1.SG Avon to Kalgoorlie | Avon Yard to West Merredin		2,931,371,150									
1.SG Avon to Kalgoorlie | West Merredin to Merredin		31,187,168									
1.SG Avon to Kalgoorlie | Merredin to Southern Cross		1,832,406,761									
1.SG Avon to Kalgoorlie | Southern Cross to Koolyanobbing East		830,134,177									
1.SG Avon to Kalgoorlie | Koolyanobbing East to Mount Walton		1,568,311,029									
1.SG Avon to Kalgoorlie | Mount Walton to West Kalgoorlie West		2,916,496,958									
1.SG Avon to Kalgoorlie | West Kalgoorlie West to West Kalgoorlie		25,368,028									
1.SG Avon to Kalgoorlie | West Kalgoorlie to Kalgoorlie		65,882,550									
1.SG Avon to Kalgoorlie | Kalgoorlie to Parkeston (border)		10,951,886									
2.SG Forrestfield South to Kewdale | Forrestfield South to Kewdale		2,700,210									
3.SG Kalgoorlie to Leonora | Kalgoorlie to Menzies		264,225,265									
3.SG Kalgoorlie to Leonora | Menzies to Malcolm		214,723,696									
3.SG Kalgoorlie to Leonora | Malcolm to Leonora		19,670,977									
5.SG West Kalgoorlie to Esperance | West Kalgoorlie South to Hampton Intermo		185,851,749									
5.SG West Kalgoorlie to Esperance | Hampton Intermodal Terminal to Hampton		25,556,483									
5.SG West Kalgoorlie to Esperance | Hampton to Kambalda		442,104,085									
5.SG West Kalgoorlie to Esperance | Kambalda to Salmon Gums		2,542,017,265									
5.SG West Kalgoorlie to Esperance | Salmon Gums to Esperance		1,146,407,741									
5.SG West Kalgoorlie to Esperance | Esperance to Esperance Wharf		34,900,310									
6.SG Kambalda to Redmine | Kambalda to Redmine		3,021,973									
7.SG Cockburn North to Robb Jetty | Cockburn North to Robb Jetty (SG)		27,165,142									
10.NG Kwinana to Mundijong Junction | Kwinana to Mundijong Junction		201,308,405									
11.NG Mundijong Junction to Picton Junction | Mundijong Junction to Pinjarra		332,722,390									
11.NG Mundijong Junction to Picton Junction | Pinjarra to Pinjarra South		7,159,139									
11.NG Mundijong Junction to Picton Junction | Pinjarra South to Wagerup North		216,158,666									
11.NG Mundijong Junction to Picton Junction | Wagerup South to Brunswick No		450,523,575									
11.NG Mundijong Junction to Picton Junction | Brunswick North to Brunswick Ju		11,854,126									
11.NG Mundijong Junction to Picton Junction | Brunswick Junction to Picton Jun		368,349,065									
12.NG Cockburn North to Robb Jetty | Cockburn North to Robb Jetty (NG)		214,963									

Table 20 continued…

Historical GTK Data and Growth/Decline in Volumes (Selected Routes)											
Route Section UID	2015	2024	TOTAL GTK 2015-2024	Proportion of total GTK 2015-2024	CAGR 2015-2024	Growth 1-yr	CAGR 3 yr	CAGR 5-yr	Percentage Change 3 yr	Percentage Change 5 yr	Acceleration of SL Depreciation
16.NG Picton Junction to Bunbury Inner Harbour | Picton Junction to Bunbury Inner Harbour		95,735,323									
17.NG Picton Junction to Bunbury Terminal | Picton Junction to Picton Container Terminal		-									
17.NG Picton Junction to Bunbury Terminal | Picton Container Terminal to Bunbury Terminal		-									
18.NG Pinjarra to Alumina Junction | Pinjarra to Alumina Junction		16,824,645									
20.NG Brunswick Junction to Premier | Brunswick Junction to Brunswick East		10,764,330									
20.NG Brunswick Junction to Premier | Brunswick East to Worsley		221,914,019									
20.NG Brunswick Junction to Premier | Worsley to Worsley East		4,781									
20.NG Brunswick Junction to Premier | Worsley East to Ewington Junction		64,749,089									
20.NG Brunswick Junction to Premier | Ewington Junction to Premier		1,425,189									
22.NG Worsley to Hamilton | Worsley to Hamilton		153,986,632									
22.NG Worsley to Hamilton | Worsley East to Worsley North		2,563,385									
23.NG Avon to Albany | Avon Yard to York		67,273,131									
23.NG Avon to Albany | York to Brookton		60,368,131									
23.NG Avon to Albany | Narrogin to Wagin		381,001									
23.NG Avon to Albany | Wagin South to Katanning		68,971,307									
23.NG Avon to Albany | Katanning to Tambellup		63,972,849									
23.NG Avon to Albany | Tambellup to Redmond		250,498,204									
23.NG Avon to Albany | Redmond to Albany		64,181,519									
23.NG Avon to Albany | Redmond to Mirrambeena		452,286									
27.NG Wagin to Newdegate | Wagin to Lake Grace		145,257,312									
27.NG Wagin to Newdegate | Lake Grace to Newdegate		20,548,295									
28.NG Lake Grace to Hyden | Lake Grace to Hyden		43,675,947									
34.NG Avon Yard to McLevie | Avon Yard to Goomalling		122,005,845									
34.NG Avon Yard to McLevie | Goomalling to McLevie		85,643,820									
35.NG Goomalling to Mukinbudin | Goomalling to Amery		52,132,045									
35.NG Goomalling to Mukinbudin | Amery to Mukinbudin		68,458,301									
36.NG Amery to Kalannie | Amery to Burakin		44,371,106									
36.NG Amery to Kalannie | Burakin to Kalannie		5,838,876									

Table 20 Continued…

Historical GTK Data and Growth/Decline in Volumes (Selected Routes)											
Route Section UID	2015	2024	TOTAL GTK 2015-2024	Proportion of total GTK 2015-2024	CAGR 2015-2024	Growth 1-yr	CAGR 3 yr	CAGR 5-yr	Percentage Change 3 yr	Percentage Change 5 yr	Acceleration of SL Depreciation
37.NG Burakin to Beacon | Burakin to Beacon		12,437,569									
38.NG Millendon Junction to Geraldton | Millendon Junction to Watheroo		134,103,632									
38.NG Millendon Junction to Geraldton | Watheroo to Marchagee		286,504									
38.NG Millendon Junction to Geraldton | Marchagee to Dongara		94,992,407									
38.NG Millendon Junction to Geraldton | Dongara to Narngulu		60,219,770									
38.NG Millendon Junction to Geraldton | Narngulu to Geraldton		188,807,912									
40.NG Narngulu to Maya | Narngulu to Narngulu East		40,600,940									
40.NG Narngulu to Maya | Narngulu East to Mullewa		1,228,048,385									
40.NG Narngulu to Maya | Mullewa to Tilley Junction		1,241,566,275									
40.NG Narngulu to Maya | Tilley Junction to Tilley		39,029									
40.NG Narngulu to Maya | Tilley to Morawa		74,768									
40.NG Narngulu to Maya | Morawa to Perenjori		1,166,373									
43.NG Other siding connections | Kwinana to Kwinana Alcoa		29,997,266									
44.DG Midland to Avon | Midland to Millendon Junction		346,048,006									
44.DG Midland to Avon | Millendon Junction to Toodyay West		1,454,570,841									
44.DG Midland to Avon | Toodyay West to Avon Yard		606,095,102									
45.DG Midland to Kwinana | Midland to Woodbridge South		24,355,259									
45.DG Midland to Kwinana | Woodbridge West to Woodbridge South		329,221									
45.DG Midland to Kwinana | Woodbridge South to Forrestfield		172,791,358									
45.DG Midland to Kwinana | Forrestfield to Kenwick		133,929,992									
45.DG Midland to Kwinana | Kenwick to Cockburn East		387,020,047									
45.DG Midland to Kwinana | Cockburn East to Cockburn South		15,914,411									
45.DG Midland to Kwinana | Cockburn South to Kwinana North		202,237,330									
45.DG Midland to Kwinana | Kwinana West to Kwinana KBT		-									
46.DG Cockburn North to Cockburn East | Cockburn North to Cockburn East		4,193,713									
48.DG Other siding connections | Kwinana West to Kwinana FPA		10,085,972									
48.DG Other siding connections | Kwinana FPA to Kwinana CBH		56,862,678									
		24,989,761,492									

Key insights from the above table include:

- Total network GTKs over the period 2015 to 2024 have declined at an average annual rate of [redacted] however tonnages have declined at average annual rates [redacted] pa over five-, three and one-year time frames
- Total tonnages have declined [redacted] during the last five years, [redacted] the last three years and [redacted] the last year.
- There is a lot of variability in tonnages on some route sections
- The cessation and commencement of services (notable changes to historical demand) are not evenly spread across the network, tending to be confined to a select group (not visible in this table due to hidden columns)
- 9 routes (highlighted pink) account two thirds of the total GTKs from 2015-2024, with five of these routes experiencing volume declines of more than 30% during the last five years, making for an overall decline of 15% across these routes.
- Of the remaining routes which account for a third of the total tonnage, another 29 routes accounting for 11.3% of the total freight transported between 2015 and 2024 have experienced average annual declines of 6.5% per annum, with this increasing to an average annual decline of 14% over the past five years.
- These 29 routes have experienced percentage declines ranging from 24% to 99% during the last five years. To avoid asset stranding, it may require accelerated depreciation.

Based on these trends, RPI has identified those routes which may warrant acceleration in depreciation to mitigate possible risk of stranding and/or better meet the objectives of the *Railways (Access) Act 1998*. We break routes up into three bands for this purpose:

- Band 1 – no acceleration
- Band 2 – 1.5 times SL depreciation
- Band 3 – 2 times SL depreciation

Routes which have experienced percentage declines in each of the 1-yr, 3-yr and 5-yr periods and where the five year decline approximates approximately 30% or more are identified as routes where there may be a case to vary the rate of depreciation by 2x to avoid asset stranding or mitigate adverse commercial outcomes for access holders, while also mitigating further declines in economic activity within those corridors. Routes experienced declines but with lower declines in one or two of these time frames are assessed as warranting 1.5 times the depreciation. The remainder have SL depreciation applied as normal. We note that doing so may increase contestability within the corridor as the Railway Owner attempts to attract greater volumes to more fully utilise the available capacity.

Applying these rates across the network results in a total depreciation of $15,332.8m which compares with depreciation of $11,531m with no acceleration. These estimates combined are very close to the overall depreciation put forward by Arc of $14,761m, however, it is important to note that Arc's estimate does not include depreciation of funding costs which should also reflect the extent to which the network has been used.

7.3.2 Impacts of declining rail freight volumes

Persistent and accelerating declines in rail freight volumes across segments of the Western Australian network have implications for the Railway Owner, current and potential access users, and the regional and broader economy. These trends directly influence the economic viability of assets and provide justification for accelerated depreciation when estimating the initial Regulatory Asset Base (iRAB).

The following section outlines potential impacts by corridor, with these routes based on the analysis of volumes (see Table 20) and stakeholder feedback.

Avon to Kalgoorlie

- Persistent volume decline indicates that significant new investment is not warranted, yet major access users may face increasing financial pressure to subsidise ongoing investment.
- The core Perth–Kalgoorlie corridor is losing long-term competitiveness, particularly against road freight alternatives.

- Rising per-unit costs for intermodal freight are eroding viability, leading to a shift away from rail.
- Regional connectivity is gradually deteriorating as declining volumes reduce service frequency and resilience.

Regulatory implication: Sustained decline suggests a need to re-examine assumed asset lives and defer or avoid large-scale upgrades inconsistent with future demand.

Koolyanobbing East to Mount Walton

- Arc's large signalling and communications replacement cost is applied uniformly across the network, despite some segments experiencing 7–10% annual volume declines, possibly making certain infrastructure assumptions or MEAs inappropriate for these areas.
- With revenues declining at 6–10% per year, even high access prices may be insufficient to recover costs.
- Segments dependent on mining freight face additional volatility, with revenues exposed to commodity price cycles.
- Users risk paying for unnecessary improvements, undermining willingness to invest in long-term rail freight contracts.
- Regional employment and mining competitiveness may suffer as logistics costs escalate.

Regulatory implication: Accelerated depreciation is warranted to reflect demand risk and to avoid over-capitalisation in segments at risk of becoming stranded.

Mount Walton to West Kalgoorlie

- Freight declines are accelerating as services approach Kalgoorlie, undermining terminal economics.
- Declining throughput at Kalgoorlie terminal reduces operational efficiency, increasing unit costs for port and terminal access users.
- Infrastructure specifications may be misaligned with actual demand, leaving approach segments systematically underutilised.
- As terminal competitiveness declines relative to alternative routes, regional economic development is constrained by reduced freight access and forced modal shift.

Regulatory implication: Terminal approach infrastructure should have shorter remaining economic lives, and depreciation profiles should reflect systematic underutilisation.

West Kalgoorlie to Esperance

- Traffic is declining 10–12% annually, with falling revenue accelerating to double-digit losses.
- Certain infrastructure, such as fibre-optic cable assets, is misaligned with Traffic Operations Worker (TOW)-operated segment needs.
- Rail infrastructure built for mineral freight now faces structural overcapacity, with port-access maintenance costs exceeding revenue potential.
- Mining companies are paying for infrastructure with large levels of excess capacity, leading to prohibitive access charges and a shift to road transport.
- The Port of Esperance's export competitiveness is deteriorating, causing job losses in the freight and port sectors.

Regulatory implication: These dynamics indicate significant risk of asset stranding, warranting an aggressive acceleration of depreciation.

Kwinana to Pinjarra

- Investment decisions are contradictory to declining demand, risking stranded capital.
- Current revenue trends indicate that, absent intervention, this route could approach economic closure within the forecast period.
- Lower service reliability and higher costs will further weaken user confidence.
- Regional communities will experience total economic loss if the route ceases to operate.

Regulatory implication: Shorter asset lives should be applied to reflect elevated closure risk and potential abandonment.

Worsley to Brunswick East

- A single-commodity route with highly concentrated demand faces structural decline.
- Revenue recovery is very difficult when volumes collapse in single-commodity segments.
- Industrial users face monopoly pricing risk, with costs disconnected from commodity economics and no alternative transport options.
- Regional employment and diversification are constrained as industries become uncompetitive due to escalating transport costs.

Regulatory implication: Asset lives should reflect the marginal economics of single-commodity routes and the lack of diversification.

Avon Yard to Mirrambeena (Grain Routes)

- While some routes show growth, these are outweighed by significant losses elsewhere in the network.
- Grain freight is increasingly shifting to road as rail volumes fall by 50% or more during the past five years (three of the 10 experiencing 96%, 96% and 70% percentage declines in GTK volumes), with fixed infrastructure costs exceeding revenue by wide margins.
- CBH grain operations face transport costs exceeding commodity margins, leading farmers to abandon rail.
- Regional grain competitiveness falls as escalating rail costs impact supply chain viability.
- The rural road network faces accelerated damage from the resultant modal shift to heavy road vehicles.

Regulatory implication: Grain routes should have materially accelerated depreciation to reflect the high probability of future closure or asset write-off on selected route sections.

Further analysis can be undertaken for the final report to:

- Quantify the scale and timing of these impacts across corridors.
- Undertake stakeholder consultation with access seekers, regional users, and government agencies to validate assumptions and assess broader economic effects.
- Determine whether even greater acceleration of depreciation is justified for certain high-risk routes.

The suggested rates of acceleration may be refined prior to finalising the report to ensure alignment with forecast demand trends and regulatory objectives.

[redacted]

In relation to the first issue, the Costing Principles (based on section 47O of the Code) defines *capital expenditure as capital:*

"(a) to maintain capacity to meet existing levels of demand;
(b) to increase the capacity, level of service or life of an asset to meet increased demands;
(c) to maintain or improve the safety of rail operations;
(d) to maintain the integrity of rail operations;
(e) to comply with regulatory obligations or requirements;
(f) approved under section 47S of the Code[46]; and

45 [redacted]

46 This section relates to approval of capital expenditure by the regulator on applicable routes.

(g) any further efficient capital expenditure under section 47N of the Code[47]*,*

but excluding Operating Costs and Overhead Costs.[48]

In relation to the second issue, Section 3.4 of the Costing Principles state:

> *"If an investment which is contributed is not classified as Contributed Capital – for example if capital recovery is earned through access charges rather than a separate capital recovery charge – the contribution should be reflected as accelerated depreciation within the depreciation schedule, with the economic life for the investment set to reflect the term of the access agreement."*

[redacted]

47 This section relates to the approval of the regulatory roll-forward of the RAB and its components.

48 Where operating costs (as defined in section 3 of the Code) include:

> *(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);*

and overheads include all other costs (i.e. not capital or operating 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:

(a) office buildings;
(b) rent and utilities;
(c) payroll;
(d) legal expenses;
(e) housing;
(f) freight centres;
(g) terminal yards;
(h) depots; and
(i) other corporate expenditure.

49 [redacted]

8 Review of adjustments to operating costs

RPI has not made changes to Arc's operating expenditure adjustment of $30m and believes any changes would be immaterial to the review outcomes. This is because for estimating optimisation of the asset base, we have substituted non-operational routes for loops, such that there would not be a significant impact on operating costs.

9 Comparables analysis

This section undertakes a comparables analysis with earlier ERA access pricing determinations based on Gross Replacement Values (GRVs) and other DORC resets for below-the-line railway owners such as the ARTC (for the ACCC). This provides a reasonableness check on both the level and proportions of the relevant cost components of the DORC valuation.

9.1 Previous determinations for routes on Arc's network

RPI compares the GRV values with the relevant Construction Replacement Cost (CRC) for those routes included in three different determinations. These high-level comparisons provide an overall sense of the degree to which the current DORC valuation aligns with earlier replacement costs values after allowing for factors that differences can be attributed to.

Factors to be considered before making comparisons with the CRC (direct costs including uplifts included in the unit rates) include:

- Cost escalation between the determination date and 31 December 2024
- Design, Construct and Project Management (DCPM) (ie. railway owner costs) are excluded from the GRV
- GRV values are not depreciated
- Interest costs are excluded from the GRV
- Capital upgrades may explain different values over time
- Missing costs in earlier determinations

Redacted data for the 2013 determination were sourced from the ERA.

9.1.1 Escalation of costs

In comparing these previous ERA determinations estimates of GRV and the ARTC DORC, we have allowed for cost escalation over time. We use the cost of Road and Bridge Construction in Western Australia to escalate construction costs and CPI for the eight capital cities to escalate ROCs.[50] Table 21 below provides a comparison of this index with the alternative index for Heavy and Civil Engineering Construction (Australia). The latter has outpaced the former from 2009 and 2013 to 2024 respectively. This escalation explains some of the differences in value between the adjusted GRVs and the CRC proposed by Arc.

[50] PwC in their 2007 report for the ERA "Review of WestNet Rail's Floor and Ceiling Costs for Certain Rail Lines (June 2007) state that "PwC/HCS contacted ABS and confirmed that this index was their most appropriate for measuring the change in rail network costs (as no rail costs specific index is available)".

Table 21 Indices for cost escalation to facilitate comparison of replacement values

Indices - Road and Bridge Construction WA (Index Numbers, Original) vs Heavy and Civil Engineering Construction (Aust)		
Period	**Road and bridge construction (Western Australia)**	**Heavy and Civil Engineering Construction (Australia)**
% Change from Sept 2009	44.5%	52.7%
% Change from Dec 2013	29.3%	36.5%
% Change from Dec 2020	23.5%	22.0%

Source: ABS 3101 Road and bridge construction Western Australia (A2333769K) and 31 Heavy and civil engineering construction Australia (A85219099L)

We note a CPI percentage increase of 33% was used to escalate from December 2013 to December 2024.[51]

9.1.2 Capital upgrades

Capital upgrades are associated with higher service levels than those reflected in the asset base for each of the GRV determinations.[52] Arc in its 2017 Issues Paper Submission notes that some upgrades result in increasing operating standards for customers.[53] Arc conducts non-recurring capital works and improvements to the Network on an ad hoc basis, with these non-recurring works relating to more discrete packages of work, generally consisting of large-scale one-off projects. Not all upgrade expenditure is included in the RAB, especially where a portion is funded by a third party (either directly or through access charges), however, Arc's proposed DORC has submitted that there have been no contributions.[54]

Section 5 of our report estimates a level of capital upgrades since 2009. RPI has allowed for contributions of $1,422m based on analysis of publicly available information and information provided by stakeholders.

For the 2009 and 2013 Determination, we allow for $1.35b in upgrades, with this amount decreasing to a fraction of this between 2019 and 2025 (a ballpark figure of $110m).

9.1.3 Missing costs in earlier Determinations

Another factor that may explain some of the difference between escalated GRVs and Arc's CRC estimates is that some costs were omitted in previous Determinations. Building costs appear to be omitted from the 2013 Determination. These include depots, maintenance facilities and platforms and combined account for approximately $45m.

9.2 High-level comparison of earlier GRV estimates with the CRC

The routes used in the three previous determinations for access pricing were identified by the route, section name and length to ensure the values being compared were for the route sections identified.

Table 22 below provides the results of this high-level comparison across the three determinations, with the 2013 Determination providing more information as it covers 78% of Arc's network. After allowing for the cost escalation and

51 ABS Cat. No. 640102.

52 Note that renewals or routine maintenance which maintains service levels will not explain the difference. Arc publishes a summary of capital works on its website. It lists the recurring capital works and improvements to the Network on an ongoing basis to ensure assets are fit for purpose.

53 Renewals maintain existing infrastructure and are treated as capital for regulatory modelling, but do not expand the value of the RAB beyond the initial GRV/DORC value.

54 Assets that benefit a single access holder or are built specifically for them are often funded by the user, are excluded from the RAB to avoid double recovery.

capital upgrades, there remains a great deal of CRC valuation that is unable to be explained by escalation or capital upgrades. This could suggest either overvaluation of the CRC, which forms the basis of the DORC estimate, or alternatively, undervaluation of the asset base in these earlier determinations. The similar CRC figures to GHD's figures in Arc's proposal (7% deviation) would suggest the latter is the case.

Table 22 High-level comparable analysis GRV and CRC - earlier determinations

High-level Comparabe analysis against Previous Determinations												
Determination	km routes	% of total applicable routes	Total GRV estimated (excl DPCM & Finance Cost)	Escalated GRV to 2024	Upgrade CAPEX (est only)	Revised GRV (incl escalation and upgrades)	$m/track km Esc GRV	Construction RC Arc 2024	$m/track km[a]	Unexplained Difference	% Difference	% Difference Weighted avg $/track km[a]
Westnet Rails - Final Determination on the Proposed 2009-10 Floor and Ceiling Costs	2002	38%	$1,951m	$2,820m	$1,350m	$4,170m	$2.08	$10,402m	$5.06	$6,232m	149%	143%
Co-operative Bulk Handling's Access Proposal dated 10 December 2013	4170	78%	$5,401m	$6,985m	$1,350m	$8,335m	$2.00	$15,746m	$3.91	$7,412m	89%	96%
Australian Western Railroad's access proposals of 13 January 2021	1209	23%	$2,127m	$2,627m	$110m	$2,737m	$2.75	$3,966m	$5.52	$1,228m	45%	101%

a Estimates using weights based on the proportion of overall replacement construction cost. Weights were not used for two earlier determinations since data on capital upgrades was aggregated across all routes. Note the 2020 Determination GRV's are those put forward by Arc, but which were not approved by the ERA.

9.3 Review of Railway Owner's Costs

This section compares the Railway Owner's Costs in the ERA's 2013 Determination with the level used by Arc in its current proposal. The WestNet Rail Costing Principles approved by the ERA April 2011 define overhead costs as *"overheads attributable to the performance of the railway owner's access-related functions whether by the railway owner or an associated."* This was *reaffirmed in 2016–2019 reviews, with* "Railway Owner's Costs" understood to be the indirect costs incurred by the railway owner in delivering capital works or managing the rail network. They include:

- Project management and administration;
- Engineering design and approvals;
- Procurement and contract management;
- Environmental, heritage, and safety management;
- Regulatory compliance;
- Land tenure and stakeholder liaison; and
- Allocated corporate overheads that directly relate to the regulated network.

These "Railway Owner's Costs are applied as an uplift percentage to the direct construction cost. These costs exclude financing costs and working capital and in that determination were referred to as Design, Construct and Project Management (DCPM) costs.[55] Table 23 compares the equivalent railway owner costs allowed for in the 2013 Determination for these sample routes with those proposed by Arc for the purposes of estimating the iRAB. These sample of routes account for 1,543km (30% of the network) of the 4,127km (78% of the network) relevant to that determination.

Table 23 Comparable analysis – 2013 Determination Vs Arc's proposed Railway Owner costs

Comparable Analysis - Railway Owner Costs - 2013 Determination Vs Arc's Proposal - Sample Route Sections							
Network	**Route No.**	**Route** / **Route Section**	**km**	**DCPM Costs 2013 Determination**	**DCPM Costs escalated to Dec 2024[a]**	**Escalated CRC[b]**	**% of Escalated 2013 CRC**
EBL	5	Kambalda to Esperence		$89m	$118m	$573.5m	20.6%
		Kambalda to Redmine	*6.4*				
		Kambalda to Salmon Gums	*235.0*				
		Salmon Gums to Esperance	*108.5*				
EGR	1	West Merredin to Koolyanobbing East		$69m	$92m	$446m	20.6%
		West Merredin	*4.5*				
		West Merredin to Merredin	*2.5*				
		Merredin to Southern Cross	*132.0*				
		Southern Cross to Koolyanobbing East	*60.7*				
EGR	1	Koolyanobbing East to West Kalgoorlie		$68m	$90m	$437m	20.6%
		Koolyanobbing East to Mount Walton	*85.4*				
		Mount Walton to West Kalgoorlie West	*115.7*				
		West Kalgoorlie West to West Kalgoorlie	*8.0*				
		West Kalgoorlie	*3.2*				
EGR	1	Avon Yard to West Merredin	*181.9*	$71m	$94m	$456m	20.6%
MR	38	Millendoon Junction to Moora/Dongara		$86m	$115m	$556.7m	20.6%
		Millendon Junction to Watheroo	*185.9*				
	395.0	*Watheroo to Marchagee*	*28.5*				
		Marchagee to Dongara	*180.6*				
Midwest	40	Nangulu to Tilley		$88m	$117m	$568m	20.6%
		Narngulu to Narngulu East	*2.8*				
		Narngulu East to Mullewa	*101.6*				
	204.3	*Mullewa to Tilley Junction*	*98.1*				
		Tilley Junction to Tilley	*1.8*				
Subtotal			**1543**	**$470m**	**$625m**	**$3,037m**	**20.6%**

a ABS Cat. No. 640102 CPI Eight Capital Cities All Groups CPI shows a percentage increase of 33.02% between December 2013 and December 2024. Note that this index is used for the Railway Owner costs, whereas component costs of the GRV were escalated using the Road and bridge construction (Western Australia) price index.

b ABS 3101 Road and bridge construction Western Australia (A2333769K) has been used to escalate CRC costs with a percentage increase of 29.3% since 2013.

55 RPI has confirmed with the ERA that the DCPM Costs align with Railway Owner costs. (Email communication 14 October 2025).

High-level insights include:

- For this sample of routes, the DCPM costs amounted to 20.6% of the CRC (both before and after escalation) which is comparable to the percentage allowed for by Arc in relation to Railway Owner Costs.

9.4 Comparison with other networks and jurisdictions

This section compares Arc's CRC with that undertaken for ARTC by GHD Advisory under the ACCC's regulatory framework. Using a similar approach, but this time comparing the breakdown of replacement construction costs for ARTC estimated by GHD as at July 2019.

Table 24 Comparison of components of CRC – ARTC (escalated) Vs Arc

Comparison of components of Replacement Construction Costs - ARTC Vs Arc									
Asset Type	**Amount @ 1/7/2019**	**Escalated to 2024 (23.8%)**	**%**	**Aggregated to comparable cost category**	**December 2024 Cost build-up (excl margins and fin costs)**	**Amount**	**%**	**Aggregated to comparable cost category**	**Proportion Arc/ARTC**
					Formation	$1,595m	8%		
					Access Roads	$607m	3%	$2,287m	145%
Earthworks	$1,271m	$1,573m	7%	$1,574m	**Earthworks**	$18m	0%		
Fencing	$0.2m	$0.2m	0.001%		**Clearing and Grubbing**	$67m	0%		
Bridges	$4,408m	$5,458m	24%		**Bridges**	$486m	2%		
Tunnels	$918m	$1,137m	5%	$7,011m	**Tunnels**	$64m	0%	$840m	12%
Culverts	$178.7m	$221m	1%		**Culverts**	$290m	1%		
Misc. Structures	$157.2m	$195m	1%				0%		
Ballast					**Sleepers**	$2,894m	15%		
Sleepers					**Rail**	$7,402m	37%		
Rail lubricators and points	$164m	$203m	1%		**Ballast**	$1,351m	7%	$12,102m	108%
Rail	$8,307m	$10,286m	45%	$11,212m	**Turnouts**	$456m	2%		
Turnouts	$585m	$724m	3%				0%		
Signals Comms[b]	$1,630m	$2,018m	9%	$2,018m	**Signals**	$4,309m	22%	$4,334m	214.8%
					Control Centre	$25m	0%		
Miscellaneous[a]	$151m	$187m	1%		**Depots**	$14m	0%		
Utilities[c]	$64m	$79m	0%		**Platforms**	$0m	0%		
Buildings			0%	$944m	**Walkways**	$70m	0%		
Level Crossings	$547m	$677m	3%		**P&E**	$62m	0%	$312m	33.1%
			0%		**Signage**	$8m	0%		
			0%		**Maintenance Facilities**	$124m	1%		
			0%		**Level Crossings**	$35m	0%		
Total Replacement Cost	**$18,380m**	**$22,759m**	100%	$22,759m	**TOTAL**	**$19,876m**	**100%**	**$19,876m**	

a Arc's categorie of Miscellaneous is based on the sum of walkways, P&E and signage. ARTC's Miscellaneous assets include airstrips, stations (platforms) and non-safety critical equipment.
b ARTC breakdown shows Signals and signal buildings and enclosures account to $693.1m and Control Equipment accounts for $258.5.
c Utilities includes power supply and distribution substations.

This comparison provides that following insights:

- Signals and communications costs for Arc are more than 200% higher than the escalated comparable cost for ARTC (note RPI's indicative cost for signalling and communications is $4,167m, compared with Arc's estimate of $4,309.2m (a decrease of 3%))

- Signals and communications account for 22% of Arc's CRC, whereas they only account 9% of ARTC's CRC. This may be due to less signalling and communication assets on the ARTC network compared with Arc's network.
- Right-of-way assets are 145% greater than the escalated cost for the comparable asset category for ARTC, even though ARTC has 8,500 track km and Arc only has 5,270 track km.
- Track assets are comparable with ARTC track asset costs, however, this is disproportionate based on the relative track km for both networks.

While the above analysis provides a comparison across the component asset groups for the ARTC estimated CRC and Arc's proposed CRC, Table 25 below compares the various DORC components for both ARTC and Arc's network, showing both Arc's proposed components and RPI's indicative values.

Table 25 High-level comparison ARTC DORC July 2019 vs Arc DORC (both Arc's estimate and RPIs estimate)

High-level comparison - ARTC July 2019 DORC and Arc DORC vs RPI Indicative DORC (2024)												
Total km	Total replacement cost (CRC+ROC)	Optimisation (% of Total RC)	Alternative procurement cost savings	Contributions (incl grants)	Total optimised replacement cost (excl contrib)	IDC & % of Total ORC	Total ORC incl IDC	Deprecn (pre-accel)	Deprecn (post-accel)	OPEX Savings (% of Total DORC incl IDC)	RAB (% of Total RC)	RAB/km
ARTC 8500km	**$18,387**	*-$475.4*	*na*	*-$283.3*	**$17,628.7**	*$3,066.1*	**$20,978.1**	*-$10,404.7*	*na*	*-$41.6*	$10,248.6	$1.21 *Escalated 23.8% to valuation date*
		-2.6%		*-1.5%*		*17%*		*-49.6%*			*56%*	**$1.49**
Arc 5270km	**$23,721**	-$158	-$2,650	$0	**$20,913**	*$9,140.8*	**$30,054**	*-$14,761*	*na*	*-$30.2*	$15,263	**$2.90**
		-0.7%	*-11.2%*	*0.0%*		*43.71%*		*-49.1%*			*64%*	
RPI 5270km	**$22,023**	-$3,740	na	-$1,432	**$16,852**	$3,583	**$20,435**	-$8,579	-$11,898	*-$30.2m*	$8,506	**$1.61**
		-17.0%		*-6.5%*		*21%*		*-42.0%*	*-58.2%*		*39%*	

a Note that RPI removes contributions from the asset base before depreciation, whereas ARTC contributions are removed as a final carve out.

Key insights from the above analysis include:

- Arc's estimated DORC of $15,263m appears to be over-valued with their $m/track km rate of $2.90 which is greater than RPI's indicative estimate of $8,506m (i.e. per tkm rate of $1.61).
- When comparing to GHD's 2019 estimate of the ARTC $m/tkm cost (adjusted for cost escalation of 23.8%), their estimated DORC of $10,249m amounts to $1.49/km (8,500km) which is relatively close to RPI's indicative rate of $1.61/tkm.
- The proportion of funding costs estimated by RPI is closer to the percentage of ORC estimated by GHD for ARTC in 2019 (21% for RPI compared with 44% for Arc's estimate with ARTC's funding costs estimated at 17% of ORC).
- The estimated depreciation rates are similar for all three estimates (i.e. circa 50%), before RPI applying acceleration to those route sections experiencing significant declines over the past 5 years. Note that Arc have not depreciated the funding costs, so we are not comparing like-for-like.

10 Stakeholder Feedback and Issues Raised

This section summarises the feedback from stakeholders. It compiles the feedback by issue, with demonstrating the extent to which multiple stakeholders have expressed the same views. The Table 26 points to the relevant section of the report which deals with the issues raised. Table 27Table 27 then provides a brief response to selected feedback.

Table 26 Stakeholder Feedback 12 August 2025 – by issue

Stakeholder Feedback – 12 August		
Stakeholder	**Issue identified/raised**	**Section of report this is addressed**
Excessive DORC Valuation	***AMEC:*** DORC is overvalued and the resulting ceiling values will be exorbitant (i.e. resulting charges risk not being cost-reflective and excessive). The asset valuation should err on the "side of conservative realism". ***Aurizon:*** Arc's valuation is "highly inflated having regard to regulatory precedent and our expectations of reasonable input assumptions." "…The DORC value presented by Arc and GHD completely fails to achieve the objectives of the Code Amendments, as the effect of the unreasonable input assumptions and variations from regulatory precedent mean that the estimated DORC value materially exceeds the previous estimates of GRV (in current $ terms). From Aurizon's analysis, it is clear that a reasonable DORC value for Arc's network will be a small fraction of that proposed by Arc and GHD." Aurizon argue that GHD "adopt unreasonable, and in some cases technically incorrect, positions on a wide array of assumptions". There is "a risk that any attempts to 'fix' problems with this assessment will either miss issues or miss their compounding impact on other aspects of the valuation." Their submission provides estimates of the impact of the identified issues both in isolation, and the combined impact. Aurizon considers that the ERA needs to undertake its own comprehensive assessment of a reasonable DORC value. ***CBH:*** Arc's DORC values are *"drastically over-inflated"* and reflect the use of assumptions that are often extreme outliers when compared with regulatory precedents and other accepted benchmarks. Their estimated DORC value is up to 7 times more than a reasonable figure. On this basis they argue that *"The ERA should not approve Arcs DORC Report or Depreciation Schedule."* The DORC (which includes depreciation) is on average 47% higher than escalated GRV values, which exclude depreciation. ***KML:*** KML provides detailed corporate transactions data for Arc Infrastructure which provides a historical valuation of the assets (market valuation) as at December 8, 2010 pursuant to the merger of Brookfield Infrastructure Partners and Brookfield Asset Management with Babcock & Brown Infrastructure (the latter later renamed Prime Infrastructure), with the full acquisition of Australia's Prime Infrastructure implicitly valuing Prime at $1.8b. KML states (11 August submission, p44) *"KML believes that, apart from considering the calculation methods in the DORC Report, the reasonable amount for Arc's charging basis should not exceed Arc's initial acquisition cost of the Western Australian rail network, plus its subsequent capital investments, minus the capital contributions borne by KML and other rail users."*	S10 S3.1.2

	PN: PN state that the ERA will need to review carefully several areas where they "believe the proposed approach is incorrect." (p1) ***CCIWA:*** CCIWA states that Arc Infrastructure's submission is seen to depart from regulatory precedent set by the ERA and the approach adopted in the ARTC Interstate Network DORC valuation. They note that valuation is currently occurring against a potential re-acquisition by the State Government, and that *"This valuation may have an outsized influence on the final valuation."*	
Lack of transparency and/or supporting information	***AMEC:*** The valuation methodology applied by Arc lacks transparency Unit rates used for track, structures, signaling etc. need to be supported with a sufficiently broad number of projects and/or cost indices. This needs to be made transparent. In addition, unit costs should reflect: • economies of scale and • competitive tendering. The industry notes that the use of Perth CPI is not appropriate, and that a broader index of construction costs should be used. ***Aurizon:*** GHD has only undertaken a high-level desktop assessment, with little reference to the actual assets, or their age and condition. No evidence is provided as to whether assets (e.g. access roads and walkways) are installed. ***KML:*** KML note that Arc has only provided aggregated data at the regional level and has not disclosed the key technical parameters or other detailed information for each route section. They note that many unit costs are disclosed in aggregate, resulting in insufficient data transparency. On this basis, they note that it is difficult to effectively carry out a reasonable assessment of DORC data. KML states that Arc has failed to supply supporting materials with its depreciation schedule, including key data such as: • asset commissioning dates • asset condition framework • explanations for variations in actual asset performance compared to design life • maintenance records • current condition of assets In addition, KML lists the following information shortfalls:	S12

	• detailed data by route section showing the DORC calculation process and results • basis for the quantities and unit prices used • any third-party valuation reports for the relevant railway assets in the past information regarding the price paid by Arc for the acquisition of the railway ***CCIWA:*** There is currently a lack of transparency around costs. Industry is concerned that the final cost to users may not be reflective of margins.	
Lack of comparables analysis	***Aurizon:*** Arc's submission has given no consideration to ERA's established regulatory precedent (previous estimates of replacement value). GHD's assessed asset replacement costs are, in many cases, "far higher than we consider reasonable given construction comparators, ERA precedent and GHD's own assessment undertaken for the ARTC Interstate Network." E.g. Track replacement costs are more than double GHD's own assessed replacement costs for ARTC. Reducing track replacement costs to previous benchmarked rates would reduce the track construction cost by around $6 billion, and would, in isolation, reduce GHD's DORC value by around $4.2 billion. Likewise, GHD's 49.5% allowance for contractor indirect costs is excessive given previous benchmarks and reasonable expectations, particularly having regard to the 1-2% margin previously accepted by the ERA. ***KML:*** KML have requested that the ERA require Arc to submit any third-party valuation reports for the relevant railway assets in the past, as well as information regarding the price paid by Arc for the acquisition of the railway. In their 11 August submission, KML provides a detailed account of the valuation prices at previous points in Arc Infrastructure's corporate history.	S10
MEA specification/Asset specification Related depreciation issues (See Accumulated Depreciation)	***AMEC:*** MEA over-specification – e.g. use of higher axle loads or speeds than those offered/used, may be costing service levels higher than what access seekers currently obtain/use. This could result if Arc has upgraded the routes beyond current performance/requirements. AMEC argues that there should be more transparency around the whole-of-life costs associated with Alternative A and Alternative B signaling asset valuations. It would be beneficial if ERA had stated the criteria for decisions around which to use, to ensure that there is not a bias towards the higher valuation option. ***CBH:*** CBH contends that there are significant differences between the LOS provided by the MEA specification and existing assets. Where this occurs, it warrants some adjustment, either to the MEA specification and associated costs, or through optimisation.	S3.1.1

	Examples in CBH's submission in relation to MEAs adopted include: • Arc propose a Radio Based Train Control (RBTC) system as Alternative B as a lower cost alternative to replicating the existing system (Alternative A). CBH argues that Alternative B should be adopted as the MEA at the replacement cost phase based on it being the lowest current cost. • CBH argue that Arc should remove all proposed asset specific mark-ups from signaling and communication / control system assets, including specialist contractor preliminaries (35%) and specialist contractor overheads and profits (20%) (Recommendation 8) • Notwithstanding the above point, CBH notes the following in relation to Alternative A: - CBH are concerned that the fibre optic cable installation has not been applied appropriately. E.g. Cable has been priced for the entire approx. 380km Kalgoorlie to Esperance line, even though only 16km of the line between Kalgoorlie and Hampton is operated under CTC (with the remainder operated under Train Order Working (TOW)). They state that this 364km section should be removed from the DORC. - The average fibre optic supply, test and commission and installation rate of $504/m (excluding indirect costs) is significantly higher than the cost provided by CBH's Tier 1 construction contractor ($99/m) - Quantities and unit rates for signaling and control systems in Table 4-27 and s4.10.1 (Pedestrian Crossings) should be checked for double counting. - Arc should make clear what assets are included in control centre signal assets so that they can be reviewed. - CBH states that the location indexes should only be applied to the location of the asset/buildings themselves, rather than to the assets they service, as this will more accurately reflect their replacement costs. - Arc should provide the rationale or justification for the quantities and unit rates for communications assets for each Network Group (Table 4-30) and again, these should relate to replacement of the communication assets/buildings themselves. In addition, Arc should provide additional detail on the build scope for each communication asset in Table 4-30 so that they can be assessed. - ERA should validate all the proposed radio mast asset costs to ensure that they reflect appropriate quantities/specifications and the lowest cost to replace. ***KML:*** In relation to Alternative A and Alternative B Signaling and Communication Costs/Control Systems, KML states that costs have been significantly over-estimated for Alternative B with: • The quantity of fibre-optic cable proposed far exceeds the actual requirements, with this only necessary between the radio base centers and the location cases • The costs for radio towers do not account for existing infrastructure, whereby precedent exists in the Australian rail sector for utilizing existing Telstra towers to support radio infrastructure ***PN:*** PN consider the implications of adopting MEA for estimating replacement costs and measuring accumulated depreciation. They note that new railway assets constructed to modern standards might be expected to have greater service capability." They state*: "Where a*	

	significant difference exists, the lower service capability of the existing assets should be reflected in the depreciation adjustment from the ORC to the DORC." Two examples they provide to illustrate this issue relate to: • Whether substituting concrete for timber sleepers inherently allows higher services standards with respect to axle loads and train speeds • Whether modern equivalent signaling assets allow for more efficient train control, and so greater average speeds to be achieved. They state, "If any such differences in service capability are likely, then we submit that the ERA should consider whether corresponding depreciation adjustments should be made to reflect the inherently lower value of the existing assets."	
Asset specification and replacement costs	***CBH:*** Examples in CBH's submission in relation to the specification of assets include: • Arc propose using 50kg/m and 60kg/m rail on the Burakin to Beacon line section, which currently operates with 30kg/m rail. CBH argues that 41kg/m should be specified in this region (as was the case in ERA's 2014 Determination). • Clearing and grubbing costs should be based on a topsoil stripping depth of 0.125m, rather than Arc's proposed 0.5m. • The proposed 8,636,530m^2 total clearing and grubbing area is excessive and needs further interrogation, especially in relation to the Mullewa to Tilley section where average corridor is 86m. • Costs associated with cuttings and embankments should be adjusted to minimize double handling of material (i.e. Arc assume 100% cut to stockpile to fill). • Formation costs should adopt a total formation width of 6m for NG and 6.5m for SG in place of Arc's 7m assumption for all gauges. • All formation costs associated with areas of the network that have no formation should be removed. • All costs associated with access roads should be removed due to them being excluded under a brownfield construction methodology. Failing this, ERA a 3 m wide and 50mm depth for access roads should be adopted, or an escalated rate from the ERA 2014 Determination. • ERA should validate the proposed bridge costs as they are unreasonably high compared with historical benchmarks and adopt escalated bridge rates for the ERA 2014 Determination in the absence of other reasonable bridge rates (Recommendation 6) • Arc should adopt a direct unit cost of $410/m for 600mm culverts based on costs published in Rawlinson's Australian Construction Handbook 2025 (Recommendation 6) • There is no rationale for including tunnel costs in this iRAB but excluding them from ERA 2009 and ERA2014 Determinations; CBH considers the unit rates for tunnels proposed by Arc to be reasonable. • CBH provides a detailed list of recommended weights and unit costs for different gauges relevant for track replacement costs (Recommendation 7 p26). • CBH states that the location indexes should only be applied to the location of the asset/buildings themselves, rather than to the assets they service, as this will more accurately reflect their replacement costs. • CBH states it is not clear why there are no buildings included in the ERA's 2014 Determination, but they are included in this iRAB.	s3.1.1 (Steve)

	• ERA should validate building and plant, tools and equipment costs and quantities to ensure they are appropriate. They should also validate the specifications underpinning Arc's walkway quantities and costs, and if not reasonable, adopt the specifications approved in the ERA's 2014 Determination (Recommendation 9) ***KML:*** KML states that there are unreasonable assumptions in Arc's DORC Report regarding quantities and rates in replacement costs. They engaged a professional railway engineering consultant to review and evaluate the engineering assumptions and technical issues for core assets (right of way, civil structures, tracks), with insufficient information or unreasonable basis regarding quantities and rates as follows: • Clearing and Grubbing (recommend adopting a direct unit rate of $2/m^2, rather than $7.70); • Cutting and Embankment (insufficient information; note that Arc's assumption around imported fill (241,761m^3 vs 146,990m^3 indicates significant overestimation). • Formation (DORC Report incorrectly treats formation as an independent activity, improperly incorporating 204 km into the cost base, whereas only 98km route from Mullewa to Tilley Junction is constructed post-2000 in the Midwest Line. • Access roads (only post-2000 access roads should be in the cost base; however, records indicate there were no new access roads built after 2000. The DORC Report incorporates the entirety of the 304km access riads (including veg clearance, topsoil removal, subgrade improvement and subgrade prep, whereas it should be confined to the 98km Mullewa to Tilley Junction route. • Bridges (KML notes significant revisions in Arc's supplementary materials increasing cost of bridges from $38.4m to $66.5m. KML state the direct unit rate for type 1 bridges is $3,732/m2, as opposed to Arc's $315,000/m2. Likewise, Type 4 Bridges originally had $8,500/m2, but this was revised to $57,612/m2, claiming increases are due to "abnormal bridge height." KML note that only 60% of bridge costs are affected by height. A doubling of cost would represent aa reasonable upper limit, with $11,900/m2 for this type of bridge a reasonable cost. • Culverts – the average rate for 1,200 mm culverts is stated as $13,900/m, but this is not consistent with the rates for 900mm and 1500mm. On this basis KML recommend decreasing it from $13,900 to $2,332. They note that the rates presented are marginally higher than the consultant would have expected, but the overall impact is negligible. • Rail – KML note that the current assignment of rail types to specific routes lacks alignment with actual infrastructure conditions and is not supported by sufficient engineering justification. Details commentary includes: - 60kg/m rails – DORC Report states 272km (i.e. equivalent to 136km track) but this is only applicable to Mullewa to Tilley Jn route. The reasonable qty would be 196.2km (98.1km track) - 50kg/m – DORC Report states 101km (50.5km track) but Narngulu to Mullewa route should be equipped with 208.8km (104.4km track) - 41kg/m – DORC Report states 234 km (117kmkm track), but remaining route from Tilley Jn to Maya should be equipped with 202.2km (101.1km track). KML states that following a correction based on actual supply rates for Pilbara delivery in the fourth quarter 2024, 41kg/m supply rate should be $148/m. The DORC Report originally cited $430/m, later adjusting this to $348/m. Likewise, the reasonable supply rate for 50kg/m is $159, with the DORC Report much higher than this (originally $440 and $353 in	

	supplementary materials). Finally, for 60kg/m rail, the reasonable supply rate is $181/m, rather than the rates put forward by Arc (originally $480 and $376 in supplementary tables). KML state that *"Even though Arc has revised the direct rates, it still overestimates the supply costs for all rail types."* • Ballast – The DORC Report incorrectly applies the standard gauge (1,435mm) ballast thickness standard (250-300mm) to the narrow gauge (1,067 mm) Midwest Line. Arc's Code of Practice states NG railways require a ballast thickness of only 200mm (a reduction of 50-100mm compared to the reported standard), leading to significant deviations in the base assumptions for ballast quantities. KML refers to Table 4-21 reporting a ballast cost of $78.2m (supply and cart $54.6/m3 and distributing, shaping and profiling of $23.6/$m^3$. Back calculations indicate the reported qty is approximately 1,000,000m^3, however, applying the NG standard of 200mm (with a cross sectional vol of 1.26/m3 per linear meter across a total track length of 304km results in a reasonable total ballast volume of 383,380m^3. KML note that Arc's failure to disclose the underlying assumptions for cross sectional area calculations makes it impossible to verify the reported rate. KML's consultant referred to a Quarry quotation in Geraldton and the supply and cartage unit rate for ballast is approx. $71.74/$m^3$, without considering location factors. • Depots and other facilities – KML state that s1.1 states depots and other facilities are excluded from replacement costs, however, Arc have included 60.427 m^2 of depots without providing further explanations. • Walkways – Arc fails to specify the exact location or functional basis of these facilities. According to current railway layout, personal access can be achieved through the formation shoulder, eliminating the need for additional dedicated structures (the cost of formation construction is already included in other sections of the report). Even under special circumstances, walkways are only applicable to siding to support train inspections, making them non-essential network facilities • KML note that the inadequate level of information provided for the following means it is not possible for them to comment on the accuracy of the quantities: - Signaling and Control system assets - Control Centre Signal Assets - Communication Assets - Centralised Control Centres - Maintenance Facilities p21] - Pedestrian Crossings - Plant, Tools and Equip - Signage	
Mark-ups	AMEC argues that there has been a significant loading of: • overheads • profit • preliminaries and • risk	S3 S9.3

	with 55% for Specialist Contractors and 44.5% for Principal Contractors. They argue this has significantly inflated replacement costs and is out of step with other precedents. ***Aurizon:*** GHD has double-counted contractor margins for signaling and communications assets, using the argument that a principal contractor would appoint a specialist contractor for this work. Where subcontractors are appointed, it should be assumed that the contractor margin will be shared amongst the various contractors, depending on the scope and scale of their assigned work and responsibility. Reducing indirect contractor margins to previously used benchmarks would cut indirect contractor costs by around $4.3 billion, and would in isolation, reduce GHD's DORC value by around $3.5 billion. GHD's allowance for railway owner project design costs is excessive given prior benchmarks and GHD's own assessment of reasonable costs for ARTC. "Preliminary planning and development and approval costs should be disregarded, given that the valuation is being conducted on the assumption that the corridor is already assembled and earthworks complete." Removing these two costs and reducing railway owner costs to previously benchmarked margins would reduce that margin by around $720m and reduce the DORC by around $550m (in isolation). ***CBH:*** Arc has applied compounding indirect cost factors that amount to a 49.5% mark-up on direct costs, upon which a further 22% in Railway Owner project costs are applied, making for a total uplift of more than 80% on direct material and labour costs. Such mark-ups are unjustified in terms of quantum and methodology. CBH argues that ERA should adopt the approach set out in the ERA 2014 Determination which included a 1-2% allowance for contractor indirect costs and a 20% DCPM margin. (Recommendation 4) Arc's 2025 signaling and communications costs are on average 4 times escalated 2014 values. This is partly due to excessive margins (62% to direct costs detailed in App A-3 reflecting multiplicative margins for specialist signaling contractor preliminaries (35%) and overheads and profit (20%). A further 49.5% margin was then applied to the total signaling and communications replacements costs (principal contractor risk allowance 5%, preliminaries 30% and overheads and profits 9.5%. A further 22% margin is then applied for Railway Owner project costs. ***KML:*** KML notes that there is a '*systemic distortion'* present in Arc's submitted DORC Report and the ERA's 2014 Determination of costs relevant to CBH's Access Proposal, both in terms of the GRV and contractor indirect costs. They note that the independent reviewer,	

	Engenium, for the 2014 Determination concluded "contractor indirect costs of 1-2% across its asset costing"…"is a reasonable rate for this class of indirect costs, while the ERA decided that the inclusion by BR of 20 percent as DCPM costs is appropriate." Arc's DORC report has allowed for indirect costs with a total impact of 61.5% of the direct cost. ***CCIWA:*** CCIWA argue that combined margins for contractor indirect costs and Arc's project management costs, which equate to an approximately 80% markup on direct costs exceeds the 17.5%-22% assumed in prior ERA Determinations and the ARTC valuation.	
Railway Owner Project Costs	***CBH:*** CBH notes the 'cost savings' identified in Arc's report are not real 'cost savings', but rather illustrate the excessive nature of the contractor markups. (In fact, theoretically, the Code in requiring the DORC to represent the lowest cost, should in fact have cost savings). CBH are not able to reconcile the various tables in chapter 5. Nonetheless, they submit that there may be further opportunities to reduce costs based on applying the "same alterative lower-cost procurement scenario' to the procurement of other asset categories such as civil structures and signaling and control systems. CBH submits that the ERA should reject Arc's proposed approach to indirect cost and railway owner project costs and instead adopt the approach set out in the ERA's 2014 Determination, which included a 1-2% allowance for contractor indirect cost and a 20% DCPM margin related to contractor indirect costs (Recommendation 16 and Recommendation 4). CBH point out several inconsistences in Arc's report, and also argue that design costs and concept/feasibility studies are not required when the specifications are known. They also submit that planning and development approval can be assumed to have been granted, siting the ERA's 2014 Determination "The 'hypothetical' replacement of infrastructure which already exists is on the basis that all routes are fully designed and optimized." Furthermore, they argue that "As the costs associated with all land corridors in place at the commencement of the Code are not included in the infrastructure capital costs, it is assumed that all necessary approvals are already in place." CBH argue that the combined contract management and supervision costs among to over $2 billion (a combined rate of 12%) which is "inordinately high" with no direct equivalent in the ARTC DORC Report prepared by GHD. CBH note that the costs associated with general project management are legitimate project costs and would be captured in the 20% DCPM margin (Recommendation 4) CBH submits that *the "allowance for railway owner overheads and corporate costs are inappropriate as they have no obvious causal connection with the lowest cost replacement of the infrastructure." (*p40, para 276)	s3.1.3 s10.1.1
Procurement Savings		S3.1.3

Excluded assets	***Aurizon:*** Aurizon argue that in excluding land and earthworks (including cuttings and embankments) except those acquired/constructed since 2000, the valuation should assume that the corridor is in place and consider the costs of replacing the network from that point. They argue that "GHD has narrowly excluded the cost of pre-2000 land and earthworks but has otherwise fully reflected the cost and time required to assemble the corridor and prepare it for track construction." ***CBH:*** For Right-of-Way assets, for assets not owned by the asset owner, but necessary to enable construction, regulatory precedent allows for the time to construct these assets, but not the cost of these assets (p14). ***PN:*** PN argues that the ERA should carefully review the scope of the DORC valuation to ensure that the assets the Costing Principles require to be included have been properly defined and the relevant capital works and costs excluded. In particular: • formation assets (account for $2,755.2m of the ORC) • access roads (account for a large proportion of the ORC and approx. are approx. 50% depreciated) PN argues that these two costs should be treated as part of "cuttings and embankments", as they were in place prior to the commencement of the Code.	
Contributed Assets	***AMEC:*** AMEC question the assertion by Arc that there has been no contributed capital (which they state also bears on the WACC), even though there is clear evidence of assets being funded by third party capital contributions based on various documents on the public record (e.g. Government funding agreements on the PTA website). The ERA must bear this in consideration. ***Aurizon***: Aurizon does not accept GHD's statement, confirmed by Arc, that none of the assets in the DORC are contributed. Again they cite substantial public evidence around the existence of large amounts of third-party capital over the last 20 years. ***CBH:*** CBH submits that Arc's assertion that none of the assets in this DORC are contributed assets *"is fanciful as various assets in Arc's DORC Report clearly appear to be funded by third party capital contributions based on various documents on the public record."* Demonstration of this includes: • Arc's 2024 annual report shows a total balance of $178m of which $171m represents Government funding designated for the purchase, construction or acquisition of new assets or as compensation for expenses or losses incurred."	

- $241m ($2010 terms) for NG re-sleepering program as documented in the PTA and WestNet Rail funding agreement. E.g. This agreement states that works valued at $43.5 m ($2010 terms) would be spent between Avon and Redmond, of which $35.25m ($2010 terms) would be funded by the PTA.
- CBH estimates of the total value of third-party capital contributions to freight rail infrastructure assets (that have been ascribed as value in Arc's DORC) could be in excess of $1.3 b based on the examples they present in Table 8 (p54), all of which are substantiated by public records.

[redacted]

- Contributed Capital adjustments to the DORC should take place prior to the estimation of accumulated depreciation under the Costing Principles. This will ensure depreciation on contributed assets is not incidentally captured in DORC values, which may result in contributed assets inflating remaining life assumptions.

KML:

KML state that "Arc has failed to truthfully and reasonably reflect the capital contributions made by third parties (including KML) to the upgrade project in the DORC Report", with this constituting a breach of S47G of the Code. They provide:

- A detailed historical corporate history and valuations for Arc Infrastructure which suggests that the quantum of the DORC is likely to be much lower than Arc's proposed DORC; and
- a detailed example of what they believe is a "material overstatement of the valuation of the Midwest Line";

[redacted]

KML's submissions provides details around its quantum of investment and the relative risks it bore as a "foundation customer". Arc's own Issues Paper 2017 to the WA Dept of Treasury and Finance's Review of WA's Rail Access Regime states "…we nevertheless consider Karara Mining to be the foundation customer for the Tilley to Geraldton section of the network due to the substantial upgrade undertaken to provide access (paragraph 352).

CCIWA:

CCIWA note that in relation to Arc's claims that none of the assets in the DORC are contributed assets, note several announcements regarding current and future capital investments by other entities, such as the freight rail duplication to facilitate the Thornlie-Cockburn link (they cite sources p2)

Level of Service and Demand Forecasts	***AMEC:*** AMEC argues that the Level of Service and Demand Forecast document should have been rigorously tested against real market conditions. It is "fundamentally flawed" analysis to assume that "historical use is an accurate prediction of future requirements." The analysis should be based on current arrangements, aligned to terms and dates. Furthermore, given the small scale of the Western Australian market a discussion or survey of future customers is not unreasonable. ***CBH:*** that while they do not necessarily take issue with the outcome of Arc's demand analysis for the operational lines CBH utilizes, it has observed several issues with Arc's approach to defining demand: • The Level of Service statement in App A-2 reflects Arc's view of network service levels. It does not reflect a 10-year demand forecast. In represents existing, historical and forecast demand in terms of the number of agreements, instead of tonnages or GTKs as was the case in the ARTC DORC report and other regulatory demand analyses. The failure of Arc to provide this information makes it difficult to assess the appropriateness of required service levels, as agreement tonnages that may impact service levels can range drastically from hundreds or thousands of tonnes to millions of tonnes. CBH state that "Arc's LOS Demand Statement should be amended to reflect tonnage or GTKs (Recommendation 10) • Arc should reference the LOS Demand Forecast Statement in the relevant sections of its Report (Recommendation 10) • Arc's methodology or rationale for arriving at forecast demand in inappropriate as it is *"not reasonable to assume that demand observed over the past ten years will necessarily continue"* and *"where there has been no demand for over ten years, it is not reasonable to assume demand for services will exist in the future unless there is clear evidence to support such a position. If there is no foreseeable demand on non-operational lines, no level of service is required, and this should be reflected."* CBH submits that the forecasts represented in Arc's LOS Demand Forecast Statement should reflect existing contracts and potential future contracts *"only where there is evidence to suggest they are reasonably likely to exist in the future."*	
Optimisation	***AMEC:*** Optimisation should eliminate: • Unused assets • Under-utilised assets (e.g. sidings, duplicate lines, overbuilt structures) ERA' process needs to scrutinize whether Arc's optimized network truly excludes infrastructure not required for "actual and reasonably projected demand". Any redundant assets should be removed in the optimization. ***Aurizon:***	

	Aurizon notes that GHD has retained non-operational routes in the valuation, even though it accepts that they are not required to meet future demand. While GHD has depreciated many of these assets on these routes to zero, its approach inflates its estimated construction time (and funding cost) and presents a misleading view of the extent of depreciation applied to the operating network. Removing non-operational assets would, in isolation, reduce the estimate ORC by $2.8 billion and, even after accounting for GHD's high depreciation on these routes, is estimated to reduce the DORC by around $170 million. More generally, Aurizon argues that GHD's implementation of optimisation is very unclear, particularly in terms of factors that have resulted in the optimisation of track assets, and their relationship, if any, with other asset types. GHD has inappropriately specified MEA as like for like rebuild of existing assets using modern materials and construction methods, rather than the modern asset design appropriate to meet required service standards. Clear examples are: • Formation • Signaling, communication, control systems This leads to excessive replacement cost estimates, insufficient application of depreciation and insufficient valuation adjustments for non-MEA assets. ***CBH:*** CBH states that Arc's DORC report states that "railway infrastructure that is either disposed of or stranded is not included in the definition or optimisation." They content that this is *"peculiar and inconsistent with the proposed approach in relation to the removal of redundant sidings."* That is, optimisation is intended to ensure that the service level required to meet actual or reasonably forecast demand, such that no demand would imply no service level is required so that such assets are removed in order to optimize the asset base. These could conceivably be disposed or stranded assets. CBH note that Arc's submission has adopted too prescriptive an interpretation of the Costing Principles, which could have led them adopting such a view (in terms of what is relevant for optimisation or not). CBH note that the ARTC DORC Report is consistent with their view on this issue. ***CBH:*** Arc has proposed 'gold plated' asset specifications that do not reflect the lowest current cost to replace railway infrastructure. Specifications are not appropriately differentiated by gauge, tonne axle load (TAL) or use (mainline vs siding). CBH contends that there are significant differences between the LOS provided by the MEA specification and existing assets. Where this occurs, it warrants some adjustment, either to the MEA specification and associated costs, or through optimisation. (E.g. In the Central zone, the MEA is approximately 70% 50kg or 60kg rail, despite all rail on these 16 and 19 TAL lines currently being between 30kg and 41kg.	

	CBH highlight inconsistencies in understanding/application, such as the statement in Arc's DORC Report that "GHD has identified instances of technical obsolescence that enable a lower cost alternative to the MEA replacement asset (e.g. signaling system). CBH note that the DORC must reflect the "lowest current cost to replace" the infrastructure with assets that have the capacity to provide the required level of service. Instances of technical obsolescence should be reflected in the choice of MEA, not as a "cost saving" based on an estimate that is not reflective of the lowest cost MEA. CBH is supportive of removing 'non-operational (redundant) route sections that are not required to meet current of reasonably forecast demand from the asset base. CBH are supportive of the optimisation of loops by either reducing their length or removing them entirely but note that these costs and the reduction in track kilometres should be clearly outlined and validated. Other points raised by CBH in relation to optimisation of various assets include: • Arc should provide specific principles, methodology and assumptions used in relation to right-of-way assets • Given the $2.7b in adjustments to track assets, ERA should ensure civil structures are optimized accordingly (Recommendation 12). Likewise, for associated track structures and miscellaneous assets (Recommendations 15 and 16) • Arc should provide specific principles, methodology and assumptions used in the optimisation of track infrastructure at a Code route segment level so that they can be reviewed and validated. • In relation to signalling and communication/control systems optimisation, CBH states that the replacement cost for Alternative B should be updated to reflect all segments currently operating under TOW being accurate costed as TOW, not RBTC. These include Avon to Albany; Hampton to Esperance; Laverton to Kalgoorlie; Millendon Junction to Narngulu; Mullewa to Tilley. • CBH are unclear why Arc have proposed the installation of a fibre optic cable for the entire track between Avon and Esperance, noting it is unclear whether this is consistent with the requirements of a RBTC system, or the categorization proposed by Arc. Inclusion of this fibre optic cable for both Alternative A and Alternative B cause the cost for Alternative B to far exceed what is required. • Similarly, costing for ratio radio towers fail to account for the precedent in the Australian rail industry for utilizing existing Telstra towners to support railway radio infrastructure. There is a minimum of 4G coverage across the entire CTC-controlled network (which would be costed as an RBTC MEA) except for a small section of approximately 10 km near Northern Gulley, east of Geraldton. CBH argues that no radio towers should be included in the DORC; only the telecommunications equipment installed on the existing Telstra towers to enable RBTC should be accounted for. • CBH is comfortable with the approach to optimize buildings and the resulting optimisation. • Finally, CBH states ERA should review and validate all other proposed signalling and communications quantities and rates as they appear high compared to historical benchmarks.	

Depreciation of assets (incl treatment for assets which have exceeded their standard life)	***AMEC:*** AMEC notes that depreciation should be applied in a manner that heavily depreciates (or even excludes) assets near or beyond their economic life. Assets which have outlived their standard design life should be valued at zero in the RAB "because they have no remaining service life from an economic standpoint." AMEC's concern is that the DORC could include assets that a prudent operator "would have fully written off in numeral operations". While the Costing Principles indicate that each asset's life be based on factors like age, usage and condition, AMEC argues that: • The process for assessing physical condition was not well defined • ERA should have mandated that assets exceeding their standard life be excluded (written down value of zero) so that users do not pay for past service that has already been consumed. ***Aurizon:*** Arc's limited data on the actual condition and age of its assets means that GHD has adopted assumed ages for a substantial proportion of the asset base. GHD's assumed ages for these assets are inconsistent with available data on Arc's past capex. For example, GHD assumes all formation assets are in an "as new" condition with not attempt to assess their actual condition. Depreciating formation assets from their estimated construction date over their standard design life would reduce the DORC by 1.9b (in isolation). Aurizon argues that, in the absence of condition data, it is inappropriate for GHD to adjust the remaining life assessed from the commission date in order to reflect any deviation from industry normal depreciation rates evident from assets where condition data is available. GHD notes the lack of information on: • condition of assets (noting there was ample time for site visits and asset sampling techniques to occur) • records on asset maintenance and renewals (noting such works will not necessarily apply uniformly across a network group) Aurizon states "*there does not appear to be any asset types where some assets have been depreciated from their commissioning dates, but for which condition-based data is available for other assets within that type. Accordingly, Aurizon considers that there are no circumstances where the deterioration rate evident for other assets is likely to provide sufficient evidence to justify any adjustment to a commissioning date-based estimate of remaining life of an asset.*" Aurizon argues that GHD has taken a selective approach to adopting the standard design lives specified in the Costing Principles. The state that the most extreme example being ballast, which even though the Costing Principles specify 50 years, is assumed by GHD to have an effective useful life of about 878 years. This excessive standard life results in a disproportionately low depreciation applied at	s7

	the valuation date. Depreciation ballast assets from their estimated construction date over their standard life would, in isolation, reduce GHD's DORC value by around $1 billion. For non-MEA assets, GHD has expressed the life of the existing assets as a % of their standard useful life remaining and has then applied this same percentage to the ORC of the MEA in order to calculate depreciation. Where the standard design life of the existing asset is shorter than the standard design life of the MEA, this approach will understate depreciation. E.g. Timber sleepers to be replaced in 7.5 yrs have 50% of life expired. An MEA concrete sleeper with a design life of 50 years would need to be 85% depreciated to achieve the same asset renewal date. Applying an MEA adjustment to the sleeper life expired would, in isolation, reduce GHD's DORC value by around $590m. Aurizon notes that standard asset design lives are based on an expectation that those assets will be adequately maintained. Therefore, GHD is incorrect to assume that the level of maintenance is a good determinant of an asset's remaining life. They note that only rail assets have condition data available, and there is no reason to believe that the condition of rail assets is a good indicator of the remaining useful life of assets that have different design lives and different maintenance and renewal profiles. Aurizon argues that" • Available data sources should be examined to provide the best estimate of likely asset age, and this should be considered for each asset type on a case-by-case basis. • Where MEA assets used have a different standard life, the relevant depreciation should be adjusted to reflect percent remaining life for the MEA asset. ***CBH:*** CBH submits that Arc's general approach to depreciation should ensure accumulated depreciation appropriately reflects the fact that, for long-lived assets, a proportion of invested capital will have been recovered already, that forecast depreciation is consistent with Standard Design lives set out in the Costing Principles and that economic lives do not exceed these standard design lives. They suggest two changes in wording in Arc's Table 6-1 to better articular Arc's approach (see Recommendation 19). More specific commentary from CBH includes: • It is not reasonable to claim that long-lived or perpetual assets should not be attributed to any accumulated depreciation. It is implausible that (i) none of the capital originally invested in these assets has been recovered and (ii) it is now appropriate to commence recovery of that capital via a depreciating RAB. • Previous DORC valuations (ARTC 2001, 2007, 2013) have reflected on such challenges. They note that earthworks are assumed to be a perpetual asset but are depreciated relative to a nominal life of 50 years, with earthworks over 50 years old depreciated to 50% of their replacement value or 50% of the remaining lease life. • CBH submit that "no reasonable investor would expect to recover returns on assets more than 100 y ears after the original investment." • Arc's depreciation assessment should be updated to reflect CBH's wording changes to " For all assets not in service, 0% Useful Life has been applied on the basis that these assets are not currently able to deliver a service because of their	

	condition", as all assets not in service should be fully depreciated if they were not already removed during the optimisation step of developing the DORC. • CBH is comfortable with the adoption of a linear depreciation model. • CBH notes the finding in the WA Supreme Court in the case of TPI v ERA that "it would be inappropriate for the economic life of an asset to exceed its technical design life." Because large portions of the freight rail network are 100+ years old and "well beyond their technical design", depreciation of such assets "needs to reflect the fact that a significant proportion, if not all the capital costs, associated with these assets has been recovered over their 100+ years in service to avoid over recovery at the expense of users. They note that ERA rejected perpetual Standard Design Lives in the approved Costing Principles. • Depreciation of right of way assets should be updated to reflect straight line depreciation over their standard design life. Where commissioning dates are not known, the commissioning dates for ballast should be adopted as it is unlikely that significant formation works occur after the application of ballast. Any right of way assets providing service beyond their design lives should be depreciated to a 10% remaining life. • CBH states that subject to removing all non-operational lines in the optimisation of the asset base, Arc's approach to calculating accumulated depreciation for bridges, tunnels and culverts is reasonable. • CBH submits that Arc should provide the ERA with asset commissioning data for bridges, tunnels and culverts (Recommendation 21). • CBH contends that the approach used by Arc for depreciating track assets would likely result in situations where the economic life of rail assets exceeds the 70-year standard design life which is inconsistent with TPI vs ERA and may result in over-recovery of costs. They argue that to address this issue, Table 6-11 should be amended to include an additional method between method 1 and 2. "Where commissioning data is known and the asset is in use beyond the standard design life articulated in the approved Costing Principles, a 10% remaining life should be applied to reflect the service being provided." with the basis for this "Follows regulatory precedent by capturing the value of the ongoing service that life-expired assets continue to provide." CBH notes that the bands used should be revised to avoid skewing the track assets towards higher remaining lives (see Recommendation 22). • In the absence of rail condition data to inform remaining life, CBH argues that Arc should base the life on the weighted remaining life of rail assets on the route section, not the weighted remaining life across all assets for the route section. This will better reflect track assets. • CBH also note that accumulated depreciation should be provided on a route segment basis as per the requirements of s47J of the Code. • CBH questioned the approach for depreciation of sleepers, providing an example of the track between Avon and Albany on the GSR Network where 26% of the timber sleeper population are over 13 years with a remaining life of 13%. They note that they are not aware of any timber re-sleeping program for this Network Group, and on this basis suggest that most of the remaining 215,000 sleepers would be beyond their 15-year design life. On this basis, they argue that they would expect the timber sleepers in this section to be depreciated to a much greater extent. Where there are no commissioning dates, depreciation should be based on a Code Route segment average remaining life based on sleeper type or failing that, the average remaining life of wooden sleepers on a comparable line as a proxy.	

	• Applying similar principles to the above points to ballast, CBH submits that accumulated depreciation should be calculated based on the 50-year design life and assets beyond their useful design life should be assigned a remaining life of 10%. This would result in ballast assets in the GSR Network Group being assigned a remaining life of 10% (as these assets are over 100 years old) instead of the 85% proposed by Arc. • Similar approaches should be used for turnouts, and Arc should provide a register of turnout types and all installation dates/ installation date assumptions for the ERA and other stakeholders for review and validation. • Arc should provide commissioning data/assumptions for signaling and control system assets to the ERA and other stakeholders for review and validation. • Arc's accumulated depreciation for walkways is approximately 30% and seems unusually low compared with access roads, where it is approximately 51%. Relevant details at a route section level should be provided to the ERA and other stakeholders. ***KML:*** KML notes that there are significant discrepancies and contradictions in the remaining economic life of multiple assets. They note that in the supplementary materials, "Arc merely adjusted the remaining life percentages to align with DORC values" without providing key data such as commissioning dates or current condition of assets. "*Arc's DORC Report calculated remaining economic life by multiplying the depreciation percentage in the report by the standard life, with the remaining economic life determined by the number of years from the current date until the book value of each asset is reduced to zero.*" KML provides a list of specific issues associated with the Standard Design Life and the Remaining Economic Life pointing out inconsistencies to what Arc modelled across: • Mullewa to Tilley Junction • Narngulu East to Mullewa • Narngulu to Narngulu East For the following assets: - Access roads (inconsistency between the DORC Report's 56% remaining standard life adopted and 80%, 70% and 40% for each of the respective routes) - Bridges (5 years remaining Eradu Bridge vs remaining lives of 43 to 65 years for Type 1 and Type 2a bridges) - Culverts (DORC Report adopts remaining econ life of 27-35 years vs KML's remaining life ranges between 46 and 49 years) - Rail (Assumption of remaining life of 53 years for all rail assets is unreasonable. A design life of 70 years is only applicable when the track geometry is greater than R=800m) - Sleepers (Based on weighted avg calculations, the DORC Report uses a remaining life approx. 30 yrs whereas depreciation sch indicates a remaining asset life of 22 years) - Ballast (DORC Report states remaining life of 41 years amounting to 82% of standard life, however the depreciation sch accounts for full 50 yr standard life with no depreciation applied	

	- Turnouts (Lack of key supporting data re distribn concrete and time turnouts on the Midwest Line; Mullewa to Tilley routs upgrade 10 years ago not reflected in depreciation sch which assigns remaining life equal to the full 40 yr standard life span). - Signalling and Control System (Fails to account for actual conditions of asset on specific route section. E.g. DORC Report applies a uniform 9.6 yrs remaining life across the entire network amounting to 48% of the standard life, whereas Narngulu to Narngulu East route has a remaining life of only 2 years which is 10% of the standard life). - Plant Tools & Equipment (insufficient underlying data to review) - Signage (insufficient underlying data to review) - Walkways (insufficient underlying data to review) ***PN:*** PN note that the existing asset will typically have a lower value than the notional new asset because of a lesser service potential of the existing asset due to at least toa a shorter useful life of the (already "old") existing asset, but also potentially to factors such as the inability of the existing assets to provide services of certain qualities or types, or as high a standard as can be delivered by the optimized new asset [see p3 and 4 of their submission]	
Location adjustments	***Aurizon:*** While location adjustments are accepted for valuing assets in regional and remote areas, the location factors applied by GHD are substantially higher than previously accepted by the ERA, with no evidence to support its adjustments. ***CBH:*** CBH states that the location indexes should only be applied to the location of the asset/buildings themselves, rather than to the assets they service, as this will more accurately reflect their replacement costs. ***PN:*** PN note that GHD has applied location factors to quantify expected higher costs of construction in regional areas than for the Perth metropolitan area (ranging from 1.1 in the Avon Valley to 1.5 in the eastern goldfields and Kalgoorlie-Esperance areas). They argue that there has been no evidence to support these escalation factors and question whether these factors are valid for cost estimation based on the fact that several factors may cause construction costs to be higher in the Perth metropolitan area (conducting works in confined areas, dealing with environmental and social impacts etc) and whether value of escalation are supported by evidence. ***CCIWA:*** CCIWA note that the unit rate calculation is much higher for Arc Infrastructure [ie. Relative to prior ERA Determinations and the ARTC valuation] due to the order of operations, for example, when location adjustment factors are applied.	
Funding costs (IDC)	***AMEC:*** Arc's inclusion of funding costs that are equivalent to 30% (approximately $9bn of the value) are extreme. The ERA must give due consideration that this is an outlier when compared to historical precedents. ***Aurizon:***	S4

	GHD's assessment of funding costs is highly inflated driven by excessive construction periods and excessive construction scope (i.e. include assets that should be excluded or optimized), with an unrealistically slow construction program. Their approach is inconsistent with previous ERA determinations. Should adopt a more pragmatic approach to construction timelines based on the hypothetical nature of this component. They provide an example of the 200km Carmichael Rail Network (including civil works) which had a 19 month timeframe. ***CBH:*** Arc's estimate of funding costs as equivalent to 30% of the Optimised Replacement Cost (ORC) "is extreme and an outlier" when compared with the historical precedent set by the ERA in 2014, where funding costs were approximately 1.6% of total construction costs. ERA should apply the same funding cost methodology adopted by the ERA in 2014. Arc's calculation includes the time required to construct cuttings and embankments across the entire freight rail network, despite the Code explicitly excluding the costs of such works completed prior to 2000. Their specific recommendations include: • Costs and time associated with construction should be limited to what is approved for inclusion in the optimized replacement cost. • The time and costs associated with the construction of access roads and pre-construction planning; design and approvals should be removed. • ERA should reject Arc's proposed development schedule and adopt the same approach used for the 2014 Determination, and if this is not done, then ERA should subject the development schedule to scrutiny. • The ERA should consider whether use of a real pre- or post-tax WACC is appropriate for the use in the calculation of funding costs depending on the proposed approach to calculating ceiling costs. ***PN:*** PN submit that "an alternative scenario of construction timing would be consistent with the economic concept of the DORC and would substantially reduce the funding cost component of the ORC." Their view is that the ERA should consider whether it would be more appropriate to adopt a construction timing based on the time for construction of discrete parts of the network over periods substantially less than 19 years." with this having the effect of substantially reducing the funding cost component of the DORC. ***CCIWA:*** Arc's proposals allowance for funding costs of approximately 30% of the asset replacement cost are not consistent with the approximate 15% in the ARTC valuation and 2% in ERA's 2014 Determination.	
Operating Cost Adjustments	***Aurizon***: Aurizon argues that GHD has made insufficient valuation adjustments to reflect the additional maintenance costs associated with assets being constructed to less than MEA standard, with GHD only recognizing limited instances of higher costs. In addition, Aurizon argue that the valuation should be adjusted to reflect the operating cost penalty imposed on rail operators, where they are unable to operate train services in a way that would be permitted, if the assets were constructed to MEA standard. ***CBH:***	S8

	CBH submits that significant operating restrictions exist on the current network which impose additional costs on users that would not be experienced if the proposed MEA network was operational. They argue that Arc's DORC should be adjusted to reflect these additional operational costs, using publicly available operational cost information (Recommendation 27). CBH contends that the net present value of rail user operating costs can act as a proxy for the reduced value attributable to existing assets compared with new assets. A DORC value without such a reduction would imply that users place the same value on existing assets as they would on MEA assets. CBH has monetized some of these additional costs based on publicly available operation information. They estimate that the reduced payload associated with operating on the current 16 TAL lines vs the MEA of 19 TAL (Toodyay to Miling; Goomalling to McLevie; Burakin to Beacon and Tilley to Perenjori) has a present value of $2.4m over 10 years. Applying travel time savings associated with the 19 TAL on other routes (Morawa to Mullewa) of 27% to all 16 TAL lines results in j$6.5m over 10 years. CBH argues that Arc should provide the remaining asset life for each asset class in years to assist with these calculations. ***PN:*** PN states that the DORC valuation should include a downward adjustment for the difference in the value to users of the poorer service potential of the actual asset. They note the higher operating and maintenance cost of the existing asset due to factors such as age, configuration and construction materials. (p4) and a shorter period until renewal or replacement of assets is required. (p4)	
Cost escalation and inflation	***AMEC:*** AMEC note that there is inconsistency in how inflation and cost escalation are handled, with it important to ensure the Code's requirement of "lowest current cost" is achieved using an index that achieves this. AMEC state that "it is unlikely DORC will ever be adjusted downwards should construction costs decrease".	
WACC and the impact it has on the iRAB and subsequent pricing	Industry has questioned the allowed WACC applied to the RAB, noting that a relatively high WACC applied to a $15 billion RAB becomes huge, with users effectively bearing the risk of both valuation and WACC parameters. AMEC also requested that future WACC determinations by the ERA consider the relatively low risk of an established network with long-term contracted volumes.	
Other - Asset identification - Calculation Errors - Robustness of the Valuation - Scope of Valuation - Accuracy level of cost estimates - Impact on access users	***AMEC:*** AMEC notes that while they normally do not comment on ERA valuations, in this instance, the size of the valuation and the significance of this rail infrastructure to their membership has caused them to. The industry has put forward the following procedural recommendations: • ERA should require that all key inputs and modelling steps in the DORC valuation be made transparent to stakeholders. • An independent expert review or audit should be submitted to the DORC. • Stakeholder participation in the Final Valuation Approval is needed. • Explicit incorporation of User-Interest Safeguards must be prioritized. • A clear methodology for handling and costing partially redundant infrastructure is needed. • Greater consideration of economic obsolescence or underutilization in special cases.	

- Flow-on effects	• Publishing the network performance metrics pre- and post consideration of an MEA Network (e.g. the maximum axle load, max train speeds, max train length) would be beneficial for transparency in price setting. ***AMEC: Flow-on effects*** AMEC notes that there are flow-on effect from an inflated RAB, particularly where demand for freight is price sensitive (eg. grain lines and regional feeders). This could make some freight uneconomic, thereby pushing freight onto roads. This could have adverse consequences for efficiency, with the Rail Access Regime meant to facilitate the use of rail infrastructure. The usage of more road freight also has unintended social consequences. AMEC has received substantial feedback from industry regarding the fact that a core purpose of regulation is not being met, namely the need to balance the monopoly owner's interests with those of users and the broader market. There are concerns that insufficient weight has been given to: • User interests • Market efficiency • Cost-reflectivity AMEC notes that the "eyewatering $15.3 billion valuation" could firmly anchor all future negotiations in favour of the asset owner. They note that the sustainability of resulting charges for users and efficient market outcomes has not been given sufficient weight. Information or analysis they would want addressed includes: • Comparison to current charges based on the current asset base • The relative economics of competing transport (road) • A user impact assessment (analysing the impact of potential tariff increases on major user segments and consideration of phasing such increases) Implications of freight shifting from rail to road The asset valuation should err on the "side of conservative realism". An ceiling price set far above the least cost (efficient cost) anchors negotiations in Arc's favour. ***AMEC (Scope of Valuation):*** The DORC only addresses a single cost component (the existing asset), and does not provide transparency on capital cost upgrades, maintenance, operating costs and overheads. ***AMEC (Robustness of Valuation):*** In addition to being excessively high, the DORC valuation appears to be highly sensitive to slight methodological changes (e.g. different signaling optimization results in $800m difference).	

	KML (Impact on access holders): KML note that the "excessively high Capacity Charges are one of the main reasons for KML's long-term financial losses. The argue that by approving Arc's unreasonably high RAB, the only beneficiary will be Arc. Access seekers will be placed at a disadvantage, imposing an undue economic burden on the State. KML state that if this situation remains unaddressed, it will severely impact KML's future sustainability and business development. ***AMEC (Relatively high-level Costing Principles):*** The approving a "high-level" Costing Principles, ERA has left much of the implementation to the asset owner's discretion. This imbalance means that users are in the position of being forced "to trust both Arc and ERA to get it right in the final DORC" without a form second round of consultation on the numbers. ***Aurizon (Relatively high-level Costing Principles):*** Arc's submission has only selectively adopted Costing Principles requirements. ***Aurizon (Calculation errors):*** Arc's submission has numerous calculation errors where the effect on the valuation is unknown. This undermines confidence in the quality of the report. ***KML (Calculation errors):*** KML point out several calculation errors, some of which were corrected in supplementary materials provided by Arc. They note several remain uncorrected including: • Cutting and Embankment (Table 4-2 $2.4m fill material) • Ballast (Table 4-21 $78.2m) • Signaling and Control Systems (Table 4-35 deviates from figures provided by Arc in section 4.4 of their DORC Report)	

10.1 Response to select stakeholder feedback

Table 27 provides RPI's initial response to selected stakeholder comments. The approach adopted for our review has also addressed stakeholder feedback, by explicitly addressing certain issues, thereby achieving greater accuracy and transparency.

Table 27 Response to select stakeholder feedback

Response to Stakeholder Feedback – 12 August	
Issue identified/raised	**Section of report this is addressed**
Excessive DORC Valuation	**S9** **S2.1.2** RPI notes that claims that the State Government's intention to buy back the Arc may be "having an outsized influence on the final value" should recognize that the DORC valuation is for regulatory purposes rather than business purposes, with regulatory precedent and scrutiny by independent reviewers an important part of the procedure of ensuring an appropriate valuation is determined.
Lack of transparency and/or supporting information	**S11** Within section 12, RPI concludes that we would need to see the [redacted] to validate our initial conclusions. Without this information, our estimates should not be regarded as valuations, but instead are alternative estimates based on RPI's knowledge of current costs associated with below-the-line railway infrastructure across various jurisdictions. We agree with the Stakeholders that the ARC submission does not provide the visibility over the assets included, the asset condition and age. Therefore, RPI can only make an alternative assessment of the direct costs associated with the construction replacement cost.
Lack of comparables analysis	**S9** [redacted] Comparables analysis is provided for GHD's DORC Valuation of ARTC for the ACCC, as well as earlier ERA Pricing Determinations for selected Arc Routes. These comparisons include: • High-level adjusted GRV values • High-level adjusted Railway Owner Costs (DCPM) • Detailed asset group component CRC costs (ARTC vs Arc) • High-level DORC build-up costs for ARTC and Arc (with Arc's estimates compared with RPI's indicative values). Adjustments for contractors' indirect job costs that included for contractors' risk, contractors' overheads and contractors' offsite overheads and margin have been assessed and adjusted where appropriate to reflect typical markup witnessed in the current industry for Tier 1 contractor's working on major infrastructure projects. All unit rates provided are RPI's alternative assessment of the direct costs associated with the construction replacement cost.

MEA specification/Asset specification Related depreciation issues (See Accumulated Depreciation)	**S2.1.1** We note the concern over the options and costs included for Signalling and Communications costs. ERA have advised that for this review RPI are to ignore any costs associated with Alternative B. As such an assessment has been undertaken for the replacement cost of signalling and communications with a modern equivalent signalling system, utilising traditional CBTC or TOW trackside signalling and comms systems together with fibre optic cabling and radio masts along rail corridor as shown. Note: ARC advised during an initial meeting that they employed track asset recording equipment to ascertain the quantum and type of trackside equipment. As such it is assumed that the assets and quantities included in the ARC submission are reflective of the actual trackside equipment.
Asset specification and replacement costs	**S2.1.1** For the purpose of the asset valuation review, all unit rates provided are RPI's alternative assessment of the direct costs associated with the anticipation of the construction replacement cost. Lack of asset register and visibility results in RPI having to accept the provided quantities included within the cost estimate build up. RPI have adopted unit rates that are typical for railway infrastructure and are based on standard construction layouts and methodologies. There may be specific sites or instances where local conditions dictate that additional, or less works need to be undertaken, but for the purposes of this review, unit rate based on typical construction methodologies and allowances have been adopted i.e. • Clearing & grubbing assumes a 300mm reduction of topsoil rather than the 500mm as stated by Arc which is considered excessive • Formation assume a typical 6m width • All bridges are assumed to be standard concrete bridge structures • 600mm culvert calculated from first principles cost build up • Rail maintenance access road/access track assumed to run at grade adjacent to all rail corridors. No clarity regarding when these roads were constructed. No visibility on buildings, plant, tools & equipment but these typical unit rates appear reasonable.
Mark-ups	**S2** **S9** RPI note that the adjustments for contractor's indirect job costs including for contractor's risk, contractor's overheads and contractor's offsite overheads and margin have been assessed and adjusted where appropriate to reflect typical markup witnessed in the current industry for a Tier 1 contractor working on major infrastructure projects. Typically, where there is a requirement to undertake specific elements of work such as signalling & communications, the main contractor will have to subcontract these works to a specialist sub-contractor.

	The Specialist Subcontractor will include markups for its own overheads, risk and margin. Dependent upon the form of contract being employed, the main contractor will then need to add additional overheads onto the Specialist's works to pay for engagement of the specialist subcontractor, supervision, coordination, management and integration of the works into the main contract. The main contractor will need to also include markups onto the specialist subcontractor's costs although they would not typically attract the full contractor's markup as suggested herein. RPI have reduced the main contractor's markups on the specialist subcontractor's costs to what can reasonably be expected within the industry for such engagements.
Railway Owner Project Costs	**Refer to S2.1.3 & S9.1.1** RPI agree with the Stakeholders that the ARC submission does not provide the visibility over when the assets were initially constructed, their condition and whether it should be included in this valuation. RPI's assumption has been to include the assets and quantities as included.
Procurement Savings	**Refer to S2.1.3**
Excluded assets	RPI advise that we do not have the visibility over the included assets with respect to the asset condition, ownership of the asset and date of construction. All assets have been priced up as provided.
Contributed Assets	RPI advise that we do not have the visibility over the included assets with respect to the asset condition, ownership of the asset and date of construction. We have carefully reviewed stakeholder feedback and publicly available information to estimate the level of contributed assets. All assets have been priced up as provided.
Level of Service and Demand Forecasts	RPI advise that all assets have been priced up as provided. RPI has undertaken analysis of forecast demand and historical demand to analyse the need for capacity based on reasonable demand forecasts for the next 10 years (to assess optimization and acceleration of depreciation).
Optimisation	**Refer s4.4** RPI advise that an assessment of optimisation has been made where appropriate.
Depreciation of assets (incl treatment for assets which have exceeded their standard life)	**S6** RPI advise that an assessment of the depreciation of the assets has been made where appropriate. We have determined an indicative depreciation based on asset type depreciation rates and our indicative CRC values, along with optimization, exclusion of contributed assets, inclusion of funding costs and acceleration of depreciation where justified.
Location adjustments	RPI note that a location adjustment has been included by ARC to value remote or regional areas. All assets have been priced based on standard unit rates.

	It is acknowledged that an adjustment factor needs to be included in these costs to allow for contractor's site mobilisation, the additional cost of transport and delivery to site of materials, the accommodation of labour and staff on site in addition to the contractor's standard site overheads. There is no evidence to support these adjustment values, however these locality adjustment rates will vary dependent upon the locality of suppliers, the contractors' depots and availability of local resources and accommodation. The review that has been undertaken acknowledges that a locality loading is required to compensate for the increased costs that projects experience the further that project is located away from suppliers and resources. Without a detailed assessment of each location, the actual location of different material suppliers, and the availability of appropriate resources, plant and accommodation required to deliver the works, an accurate assessment is difficult to ascertain. The location allowances have been applied based on set percentages. These allowances appear appropriate and typical of rates witnessed in the current industry for Tier 1 contractor's working on major infrastructure projects at locations close to and distant from main centres.
Funding costs (IDC)	**S6** RPI has estimated the funding costs by assuming 4-year project lives across the S curve duration to ensure that funding costs are not excessively high. We have provided justification for the method used along with some caveats.
Operating Cost Adjustments	**S7** At this stage RPI have applied the same operating cost savings as proposed by Arc since we believe that any changes would be immaterial to the review outcomes. This is because we have substituted non-operational routes for optimised loops, such that there would not be a significant impact on operating costs.
Cost escalation and inflation	**S9** Provides relevant cost escalation
WACC and the impact it has on the iRAB and subsequent pricing	**S6** A regulatory WACC is provided by the ERA, with justification for this approach provided in s6.2.2.
Other - Asset identification - Calculation Errors - Robustness of the Valuation - Scope of Valuation - Accuracy level of cost estimates - Impact on access users - Flow-on effects	During the review RPI identified some errors in the calculations and advised ERA accordingly. Arc provided clarifications (3) which addressed many of the identified errors. There remains some differences in the approach adopted (e.g. funding costs) and depreciation costs.

11 Assessment and Findings

[redacted]

[redacted]

11.2 Decisions by State Governments on Signalling and Communications

The valuation associated with Signalling and Communication will be supported by greater certainty by State Governments as to how this aspect of the infrastructure will be developed, taking into consideration integration across networks. We note that this will likely be some years away.

12 Conclusions and Recommendations

RPI provides support for many of the DORC's components estimated by Arc. However, there remain material differences in relation to:

- how funding costs have been estimated
- depreciation of funding costs
- allowance for contributed assets
- the analysis of forecast demand and capacity requirements
- confirmation of the MEA requirements across all categories, but specifically those required to achieve current MEA requirements for Alternative A - Signalling & Comms
- our acceleration of straight-line depreciation on selected routes due to large and sustained declines in rail freight volumes.

On this basis, we recommend that the ERA:

- not approve Arc's proposed DORC for the purposes of establishing the initial RAB for the network and
- not approve the depreciation schedule put forward by Arc in its current form.

Future steps may involve a more in-depth assessment of allocation of costs across networks, the inclusion of level crossing values included and how this relates to advice provided around ownership of such crossings and a more detailed assessment of depreciation by asset groups for each route section.

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