



Economic Regulation Authority

Determination on the 2022 weighted average cost of capital for the freight and urban railway networks, and for Pilbara railways

3 August 2022

Economic Regulation Authority

Level 4, Albert Facey House

469 Wellington Street, Perth WA 6000

Telephone 08 6557 7900

Email info@erawa.com.au

Website www.erawa.com.au

This document can also be made available in alternative formats on request.

National Relay Service TTY: 13 36 77

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1. Introduction

1. The Economic Regulation Authority administers the Western Australian railways access regime, which consists of the *Railways (Access) Act 1998* and the *Railways (Access) Code 2000*. The rail network and types of infrastructure subject to the regime are defined in this legislation.

1.1 Requirements of the Code

2. Schedule 4, clause 3(1) of the Code requires the ERA to make an annual calculation, as at 30 June, of the Weighted Average Cost of Capital (WACC) to be applied to determine the costs for each of the rail networks covered under Schedule 1 of the Code.¹ The ERA must then publish its determination of the WACC for each rail network in the Government Gazette as soon as practicable after it is made (Schedule 4, clause 3(1)(b)):
 - 3 Regulator to determine weighted average cost of capital
 - (1) For the purposes of clause 2(4)(b), the Regulator is to –
 - (a) determine, as at 30 June in each year, the weighted average cost of capital for each of –
 - (i) the railway infrastructure associated with the urban network described in items 49, 50 and 51 in Schedule 1;
 - (ia) the railway infrastructure associated with the part of the railways network described in item 52 in that Schedule; and
 - (ii) the railway infrastructure associated with the railways network described in the other items in that Schedule;
 - and
 - (b) publish notice of each such determination in the Gazette as soon as is practicable after it is made.
3. The Code also requires the ERA to undertake public consultation on the rail WACC method every fifth year, commencing in 2003, before determining the WACC values for that year (Schedule 4). The ERA undertook this five-yearly public consultation process prior to making its WACC determination for 30 June 2019.
4. This determination updates the annual calculation, as at 30 June 2022, of the WACC to be applied to determine the costs for each of the rail networks covered under Schedule 1 of the Code for 2022/23.
5. The update follows the method set out in the 2018 and 2019 rail WACC final determination.²

1.2 The 2019 rail WACC review

6. The ERA undertook a public consultation program prior to making its annual WACC determination for the regulatory year commencing 1 July 2019.

¹ *Railways (Access) Code 2000*, Schedule 4.

² Economic Regulation Authority, *Final Determination 2018 and 2019 Weighted Average Cost of Capital for the Freight and Urban Networks, and the Pilbara Railways*, 22 August 2019.

7. The ERA released the final determination in relation to the rail WACC method review on 22 August 2019.³ The final determination set out the method for the following regulated rail networks:
- Public Transport Authority
 - Arc Infrastructure
 - The Pilbara Infrastructure and Roy Hill Infrastructure railways.

³ Economic Regulation Authority, *Final Determination 2018 and 2019 Weighted Average Cost of Capital for the Freight and Urban Networks, and the Pilbara Railways*, 22 August 2019.

2. The 2022 rail WACC

8. The ERA has determined the following real pre-tax 2022 rail WACC values, to apply to the 2022 regulatory year, from 1 July 2022 to 30 June 2023.
- Public Transport Authority: 4.46 per cent
 - Arc Infrastructure: 6.83 per cent
 - The Pilbara railways: 9.37 per cent.
9. The complete set of parameter inputs contributing to these estimates is shown in Table 1.

Table 1: The ERA's final determination of the rail WACC for the period as at 30 June 2022

	Public Transport Authority	Arc Infrastructure	Pilbara railways
Cost of equity parameters			
Nominal risk free rate (%)	3.62	3.62	3.62
Equity beta	0.60	0.90	1.30
Market risk premium (%)	5.90	5.90	5.90
Nominal after tax return on equity (%)	7.16	8.93	11.29
Cost of debt parameters			
Nominal risk free rate (%)	3.62	3.62	3.62
Benchmark credit rating	A	BBB+	BBB-
Term of debt for debt risk premium	10 years	10 years	10 years
Debt risk premium (%)	1.856	2.468	3.297
Debt issuing costs (%)	0.100	0.100	0.100
Nominal return of debt (%)	5.58	6.19	7.02
Other parameters			
Debt proportion (gearing) (%)	50	25	20
Forecast inflation rate (%)	2.43	2.43	2.43
Franking credits (gamma)	0.50	0.50	0.50
Corporate tax rate (%)	30	30	30
Weighted average cost of capital (%)			
Nominal after-tax WACC	6.37	8.24	10.44
Real after-tax WACC	3.84	5.68	7.82
Nominal pre-tax WACC	7.00	9.43	12.03
Real pre-tax WACC	4.46	6.83	9.37

Source: ERA analysis

Appendix 1 International bond sample

Table 2: Public Transport Authority sample

Ticker	Issuer (Short name)
EH437851 Corp	Rio Tinto Finance USA Ltd
EI452667 Corp	Rio Tinto Finance USA Ltd
EJ101048 Corp	Rio Tinto Finance USA PLC
EJ329466 Corp	Rio Tinto Finance USA PLC
BS198166 Corp	Rio Tinto Finance USA Ltd
BW023383 Corp	CSL Finance PLC
EJ855408 Corp	BHP Billiton Finance USA Ltd
BW018337 Corp	CSL Finance PLC
BW023426 Corp	CSL Finance PLC
ZO283166 Corp	SGSP Australia Assets Pty Ltd
EJ651064 Corp	BHP Billiton Finance Ltd
EJ372146 Corp	BHP Billiton Finance Ltd
BR897356 Corp	Wesfarmers Ltd
BW016119 Corp	CSL Finance PLC
BS422627 Corp	Optus Finance Pty Ltd
AN129025 Corp	Telstra Corp Ltd
AP489931 Corp	United Energy Distribution Pty Ltd
LW938501 Corp	SGSP Australia Assets Pty Ltd
BK140531 Corp	Optus Finance Pty Ltd
EJ038718 Corp	BHP Billiton Finance USA Ltd
BW021641 Corp	CSL Finance PLC
BP960362 Corp	Wesfarmers Ltd
DD105676 Corp	BHP Billiton Finance USA Ltd
AZ151179 Corp	Optus Finance Pty Ltd
EK875768 Corp	BHP Billiton Finance Ltd
EJ372256 Corp	BHP Billiton Finance Ltd
BK140529 Corp	Optus Finance Pty Ltd
BP960220 Corp	Wesfarmers Ltd

Ticker	Issuer (Short name)
BW018087 Corp	CSL Finance PLC
AX729250 Corp	Telstra Corp Ltd
JK730176 Corp	Telstra Corp Ltd
AO500496 Corp	ETSA Utilities Finance Pty Ltd
AO674434 Corp	Victoria Power Networks Finance Pty Ltd
EJ372241 Corp	BHP Billiton Finance Ltd
AP811577 Corp	Telstra Corp Ltd
EK835349 Corp	Telstra Corp Ltd
AP198220 Corp	SGSP Australia Assets Pty Ltd
BP151663 Corp	Australian Gas Networks Ltd
AO147640 Corp	SGSP Australia Assets Pty Ltd
BH885805 Corp	Telstra Corp Ltd
ZR653913 Corp	United Energy Distribution Pty Ltd
BP151662 Corp	Australian Gas Networks Ltd
BR034641 Corp	Victoria Power Networks Finance Pty Ltd
BP046707 Corp	Victoria Power Networks Finance Pty Ltd
ED104267 Corp	WMC Finance USA Ltd
BS841983 Corp	SGSP Australia Assets Pty Ltd
AR868580 Corp	Victoria Power Networks Finance Pty Ltd
BP046702 Corp	Victoria Power Networks Finance Pty Ltd
BP086271 Corp	Victoria Power Networks Finance Pty Ltd
BM363856 Corp	Victoria Power Networks Finance Pty Ltd
BQ269730 Corp	Victoria Power Networks Finance Pty Ltd
BG207158 Corp	ETSA Utilities Finance Pty Ltd
BG116601 Corp	SGSP Australia Assets Pty Ltd
DD109142 Corp	WMC Finance USA Ltd
BS474087 Corp	SGSP Australia Assets Pty Ltd
BQ959130 Corp	Victoria Power Networks Finance Pty Ltd
AS177694 Corp	Victoria Power Networks Finance Pty Ltd
ZR723028 Corp	United Energy Distribution Pty Ltd

Ticker	Issuer (Short name)
AZ677851 Corp	SGSP Australia Assets Pty Ltd
BT335202 Corp	Toyota Finance Australia Ltd
BT335203 Corp	Toyota Finance Australia Ltd
BH621666 Corp	Toyota Finance Australia Ltd
BV247449 Corp	Toyota Finance Australia Ltd
BR260034 Corp	Toyota Finance Australia Ltd
BR260037 Corp	Toyota Finance Australia Ltd
BH621665 Corp	Toyota Finance Australia Ltd
BW722531 Corp	PACCAR Financial Pty Ltd
ZO364268 Corp	PACCAR Financial Pty Ltd

Table 3: Arc Infrastructure sample

Ticker	Issuer (Short name)
EK795274 Corp	Glencore Finance Europe Ltd
BV508582 Corp	AusNet Services Holdings Pty Ltd
BO733251 Corp	WestConnex Finance Co Pty Ltd
AP138040 Corp	Brambles Finance PLC
AX393924 Corp	Woodside Finance Ltd
BG070568 Corp	AusNet Services Holdings Pty Ltd
BR468470 Corp	Glencore Funding LLC
BV712840 Corp	South32 Treasury Ltd
ZO408308 Corp	Transurban Finance Co Pty Ltd
ZO292719 Corp	Glencore Capital Finance DAC
AM402825 Corp	AusNet Services Holdings Pty Ltd
BO221169 Corp	Glencore Capital Finance DAC
AX523734 Corp	Glencore Funding LLC
AX751745 Corp	Glencore Finance Europe Ltd
ZO072844 Corp	Aurizon Network Pty Ltd
ZQ348432 Corp	Coles Group Treasury Pty Ltd
ZO140969 Corp	Glencore Funding LLC

Ticker	Issuer (Short name)
AR226811 Corp	AusNet Services Holdings Pty Ltd
ZS106969 Corp	Glencore Finance Europe Ltd
BR468472 Corp	Glencore Funding LLC
AZ593934 Corp	AusNet Services Holdings Pty Ltd
EK146211 Corp	Glencore Finance Europe Ltd
EK755216 Corp	AusNet Services Holdings Pty Ltd
BM572667 Corp	AGI Finance Pty Ltd
ZR457256 Corp	Glencore Finance Europe Ltd
BO149790 Corp	Aurizon Finance Pty Ltd
EH033131 Corp	Glencore Finance Canada Ltd
QZ372379 Corp	Woodside Finance Ltd
BP207481 Corp	Glencore Funding LLC
ZO057190 Corp	Coles Group Treasury Pty Ltd
JK876383 Corp	Sydney Airport Finance Co Pty Ltd
BO221170 Corp	Glencore Capital Finance DAC
BH496203 Corp	Transurban Finance Co Pty Ltd
EJ410755 Corp	Glencore Finance Canada Ltd
BQ008251 Corp	AGI Finance Pty Ltd
AM946329 Corp	Glencore Funding LLC
AS241348 Corp	Sydney Airport Finance Co Pty Ltd
AP044525 Corp	Woodside Finance Ltd
LW077755 Corp	Aurizon Network Pty Ltd
ZQ348382 Corp	Coles Group Treasury Pty Ltd
BP207479 Corp	Glencore Funding LLC
BP207461 Corp	Glencore Funding LLC
EK849482 Corp	Glencore Funding LLC
ZS562160 Corp	Transurban Finance Co Pty Ltd
QJ413201 Corp	Transurban Finance Co Pty Ltd
EK348922 Corp	AusNet Services Holdings Pty Ltd
ZO140967 Corp	Glencore Funding LLC

Ticker	Issuer (Short name)
AP678913 Corp	Glencore Funding LLC
EK775847 Corp	Woodside Finance Ltd
QZ418350 Corp	Transurban Finance Co Pty Ltd
EK911822 Corp	Transurban Finance Co Pty Ltd
EI866858 Corp	Glencore Finance Canada Ltd
AO953984 Corp	Transurban Finance Co Pty Ltd
EK468529 Corp	Aurizon Network Pty Ltd
QJ221786 Corp	Brambles USA Inc
ZO056864 Corp	Coles Group Treasury Pty Ltd
EK878745 Corp	Sydney Airport Finance Co Pty Ltd
BQ008260 Corp	AGI Finance Pty Ltd
EK536984 Corp	Australia Pacific Airports Melbourne Pty Ltd
BM413847 Corp	AGI Finance Pty Ltd
EK465508 Corp	Transurban Finance Co Pty Ltd
AZ347082 Corp	Transurban Finance Co Pty Ltd
QZ932852 Corp	Australia Pacific Airports Melbourne Pty Ltd
AS533603 Corp	DBNGP Finance Co Pty Ltd
AQ252535 Corp	Energy Partnership Gas Pty Ltd
AR408024 Corp	AusNet Services Holdings Pty Ltd
QJ539736 Corp	Australia Pacific Airports Melbourne Pty Ltd
BK686424 Corp	AusNet Services Holdings Pty Ltd
BK686434 Corp	AusNet Services Holdings Pty Ltd
AR408188 Corp	AusNet Services Holdings Pty Ltd
BK686761 Corp	AusNet Services Holdings Pty Ltd
AS664625 Corp	AusNet Services Holdings Pty Ltd
AS664612 Corp	AusNet Services Holdings Pty Ltd
BK686432 Corp	AusNet Services Holdings Pty Ltd
BP749491 Corp	Worley US Finance Sub Ltd
QJ191077 Corp	BHP Billiton Finance Ltd
BK182364 Corp	Brisbane Airport Corp Pty Ltd

Ticker	Issuer (Short name)
BJ442776 Corp	Woolworths Group Ltd
QJ190880 Corp	BHP Billiton Finance Ltd
BK099175 Corp	Amcor UK Finance PLC
BK534389 Corp	QPH Finance Co Pty Ltd
BO485266 Corp	APA Infrastructure Ltd
BK647179 Corp	Ausgrid Finance Pty Ltd
BR318092 Corp	Woolworths Group Ltd
AX350089 Corp	Incitec Pivot Ltd
AS072056 Corp	Ausgrid Finance Pty Ltd
BJ085023 Corp	APA Infrastructure Ltd
AS344445 Corp	Ausgrid Finance Pty Ltd
BJ324638 Corp	Woolworths Group Ltd
AS197471 Corp	Transurban Queensland Finance Pty Ltd
BR642545 Corp	Woolworths Group Ltd
AS239645 Corp	Brisbane Airport Corp Pty Ltd
BO485268 Corp	APA Infrastructure Ltd
BJ368112 Corp	Newcrest Finance Pty Ltd
BR555926 Corp	Ausgrid Finance Pty Ltd
BK182313 Corp	Brisbane Airport Corp Pty Ltd
BR642542 Corp	Woolworths Group Ltd
BK534344 Corp	QPH Finance Co Pty Ltd
BP375805 Corp	Newcastle Coal Infrastructure Group Pty Ltd
BJ368115 Corp	Newcrest Finance Pty Ltd
AM796866 Corp	APA Infrastructure Ltd
EJ450801 Corp	APA Infrastructure Ltd
EK807839 Corp	APA Infrastructure Ltd
EK807821 Corp	APA Infrastructure Ltd
EK805538 Corp	APA Infrastructure Ltd
BP151661 Corp	Transurban Queensland Finance Pty Ltd
AO547987 Corp	Incitec Pivot Finance LLC

Ticker	Issuer (Short name)
EK805526 Corp	APA Infrastructure Ltd
AP094552 Corp	Newcastle Coal Infrastructure Group Pty Ltd
AX613734 Corp	APA Infrastructure Ltd
BO485269 Corp	APA Infrastructure Ltd
EK642479 Corp	Transurban Queensland Finance Pty Ltd
EI870493 Corp	Newcrest Finance Pty Ltd
BQ119065 Corp	CNH Industrial Capital Australia Pty Ltd

Table 4: The Pilbara railways sample

Ticker	Issuer (Short name)
BP749491 Corp	Worley US Finance Sub Ltd
QJ191077 Corp	BHP Billiton Finance Ltd
BK182364 Corp	Brisbane Airport Corp Pty Ltd
BJ442776 Corp	Woolworths Group Ltd
QJ190880 Corp	BHP Billiton Finance Ltd
BK099175 Corp	Arcor UK Finance PLC
BK534389 Corp	QPH Finance Co Pty Ltd
BO485266 Corp	APA Infrastructure Ltd
BK647179 Corp	Ausgrid Finance Pty Ltd
BR318092 Corp	Woolworths Group Ltd
AX350089 Corp	Incitec Pivot Ltd
AS072056 Corp	Ausgrid Finance Pty Ltd
BJ085023 Corp	APA Infrastructure Ltd
AS344445 Corp	Ausgrid Finance Pty Ltd
BJ324638 Corp	Woolworths Group Ltd
AS197471 Corp	Transurban Queensland Finance Pty Ltd
BR642545 Corp	Woolworths Group Ltd
AS239645 Corp	Brisbane Airport Corp Pty Ltd
BO485268 Corp	APA Infrastructure Ltd
BJ368112 Corp	Newcrest Finance Pty Ltd

Ticker	Issuer (Short name)
BR555926 Corp	Ausgrid Finance Pty Ltd
BK182313 Corp	Brisbane Airport Corp Pty Ltd
BR642542 Corp	Woolworths Group Ltd
BK534344 Corp	QPH Finance Co Pty Ltd
BP375805 Corp	Newcastle Coal Infrastructure Group Pty Ltd
BJ368115 Corp	Newcrest Finance Pty Ltd
AM796866 Corp	APA Infrastructure Ltd
EJ450801 Corp	APA Infrastructure Ltd
EK807839 Corp	APA Infrastructure Ltd
EK807821 Corp	APA Infrastructure Ltd
EK805538 Corp	APA Infrastructure Ltd
BP151661 Corp	Transurban Queensland Finance Pty Ltd
AO547987 Corp	Incitec Pivot Finance LLC
EK805526 Corp	APA Infrastructure Ltd
AP094552 Corp	Newcastle Coal Infrastructure Group Pty Ltd
AX613734 Corp	APA Infrastructure Ltd
BO485269 Corp	APA Infrastructure Ltd
EK642479 Corp	Transurban Queensland Finance Pty Ltd
EI870493 Corp	Newcrest Finance Pty Ltd
BQ119065 Corp	CNH Industrial Capital Australia Pty Ltd
BR221504 Corp	Pacific National Finance Pty Ltd
AO951980 Corp	Santos Finance Ltd
BP548462 Corp	CIMIC Finance Ltd
ZR653898 Corp	Pacific National Finance Pty Ltd
BO357863 Corp	AusNet Services Holdings Pty Ltd
BP221177 Corp	Santos Finance Ltd
AN191913 Corp	Pacific National Finance Pty Ltd
EK907291 Corp	Pacific National Finance Pty Ltd
AX518215 Corp	Santos Finance Ltd
ZO526158 Corp	AusNet Services Holdings Pty Ltd

Ticker	Issuer (Short name)
AR620052 Corp	Pacific National Finance Pty Ltd
AN441270 Corp	Pacific National Finance Pty Ltd
BS376502 Corp	Port of Newcastle Investments Financing Pty Ltd

Appendix 2 Debt risk premium estimates

Debt risk premium estimation method

1. The ERA has estimated the debt risk premium as at 30 June 2022 consistent with the method detailed in the 2019 rail WACC final determination.
2. The ERA's revised bond yield approach involves the following steps:
 - Step 1: Determining the benchmark samples – identifying relevant corporate bonds that reflect the credit rating of the benchmark credit entity.
 - Step 2: Collecting data and converting yields to Australian dollar equivalents
 - Step 3: Averaging yields Calculating an average Australian dollar equivalent bond yield for each bond across the averaging period.
 - Step 4: Estimating curves – estimating yield curves on this data by applying the Gaussian Kernel, Nelson-Siegel and Nelson-Siegel-Svensson techniques.
 - Step 5: Estimating cost of debt – calculating the 10-year cost of debt estimate for each of the yield curves in the benchmark sample and augmented benchmark sample. Adjusting the bias of cost of debt estimates from the augmented sample.
 - Step 6: Calculating the debt risk premium – calculating the debt risk premium by subtracting the 10-year risk free rate from the 10-year cost of debt.
3. These steps determine the debt risk premium at a point in time, being the date of calculation.
4. To mitigate errors that may arise given the data limitations, the ERA augments the bond sample:
 - The Public Transport Authority sample is extended from the A benchmark to A+/A/A-.
 - The Arc Infrastructure sample is extended from the BBB+ benchmark to BBB+/BBB.
 - The Pilbara railways sample is extended from the BBB- benchmark to BBB/BBB-.
5. To mitigate potential bias, the ERA first establishes the direction of the bias:
 - If the bias in an augmented sample-based estimate is likely to be downward, the ERA uses the highest augmented sample-based estimate coming from the three estimation methods. This estimate is then averaged with the highest estimate from the original benchmark rated sample.
 - The opposite approach is conducted if the bias is likely to be upward.

2022 Debt risk premium estimates

6. The 2022 debt risk premium estimates for each of the Western Australian rail networks are summarised below.

7. In 2022 the samples were augmented as follows:
- The Public Transport Authority sample was extended from the A benchmark to A+/A/A- increasing the sample from 5 to 68 bonds.
 - The Arc Infrastructure sample was extended from the BBB+ benchmark to BBB+/BBB increasing the sample from 74 to 114 bonds.
 - The Pilbara railways sample was extended from the BBB- benchmark to BBB/BBB- increasing the sample from 13 to 53 bonds.

Table 5: 2022 Public Transport Authority – Augmented and original benchmark sample debt risk premium estimates (%)

Approach	High	Mid	Low
A	3.110	3.101	1.900
A+/A/A-	2.067	1.892	1.811
Average of two lowest estimates			1.856

8. The augmented Public Transport Authority sample was expanded to allow the inclusion of A+ and A- rated bonds. Compared to the small addition of A+ bonds added to the sample, there were substantially more A- added. The larger number of A- bonds with a lower credit rating will tend to bias the estimates upward. For this reason, the lowest of the augmented sample-based estimates (1.811 per cent) is averaged with the lowest A rated sample-based estimate (1.900 per cent) to produce an estimate of 1.856 per cent (see table above).

Table 6: 2022 Arc Infrastructure – Augmented and original benchmark sample debt risk premium estimates (%)

Approach	High	Mid	Low
BBB+	2.538	2.413	2.406
BBB+/BBB	2.623	2.546	2.529
Average of two lowest estimates			2.468

9. The augmented Arc Infrastructure BBB+ sample was expanded to allow the inclusion of BBB rated bonds. The addition of bonds with a lower credit rating will tend to bias the estimates upward. For this reason, the lowest BBB+ rated sample-based estimate (2.406 per cent) was averaged with the lowest of the augmented sample-based estimates (2.529 per cent) to produce an estimate of 2.468 per cent (see table above).

Table 7: 2022 Pilbara railways – Augmented and original benchmark sample debt risk premium estimates (%)

Approach	High	Mid	Low
BBB-	3.655	3.611	3.523
BBB/BBB-	2.938	2.867	2.854
Average of two lowest estimates	3.297		

10. The augmented Pilbara railways BBB- sample was expanded to allow the inclusion of BBB rated bonds. The addition of bonds with a higher credit rating tended to bias the estimates downward. For this reason, the highest of the augmented sample-based debt risk premium estimates (2.938 per cent) was averaged with the highest BBB-rated sample-based estimate (3.655 per cent) to produce an estimate of 3.297 per cent (see table above).
11. For this final determination, the 2022 debt risk premium estimates are:
- 1.856 per cent for the Public Transport Authority
 - 2.468 per cent for Arc Infrastructure
 - 3.297 per cent for Pilbara railways.