

Central Queensland Coal Network FY27 Final Draft Proposal

Maintenance and Renewals Strategies and Budget

Prepared by Aurizon Network



AURIZON[®]

We deliver.

Table of Contents

- 1 Executive Summary.....3
- 2 Overview of the FY27 MRSB Final Draft Proposal5
- 3 Blackwater System26
- 4 Goonyella System58
- 5 Moura System89
- 6 Newlands System and GAPE.....113
- Appendix 1 – Renewal Scope Detail Report139
- Appendix 2 – Renewal and Maintenance Strategies by Asset Class140
- Appendix 3 – Alternate Considerations for Maintenance161
- Appendix 4 – Options for Renewal Approach164
- Appendix 5 – Description of Practices Used to Carry Out Asset Activity180
- Appendix 6 – Works End to End Process186
- Appendix 7 – Additional Information.....217
- Appendix 8 - Glossary218

1 Executive Summary

This document outlines Aurizon Network's final draft Maintenance and Renewals Strategies and Budgets (MRSB) for each Coal System in the Central Queensland Coal Network (CQCN) for the Financial Year ending 30 June 2027 (FY27 Final Draft Proposal) to the Rail Industry Group (RIG).

1.1 Asset Management Strategy

Aurizon Network's asset strategy and scope selection is based on the age, condition, criticality and performance trends of the assets and includes both an estimation of deterioration and the application of strategic smoothing of renewals. Strategic smoothing aims to manage significant peaks in renewal activity over limited timeframes. The underlying scope of asset activity (both maintenance and renewals) outlined in each system's MRSB seeks to balance cost, reliability of assets and access to the network and is a function of the defined policies, standards and processes to meet safety, legislative and regulatory requirements.

1.2 Maintenance Budget

For the Central Queensland Coal Network (CQCN), the FY27 Final Draft Proposal includes a **maintenance budget of \$208.6 million** (excluding ballast undercutting plant depreciation) representing an increase of \$11.9 million against the FY26 Budget.

This reflects:

- **Targeted drainage program** to be delivered within the General Track maintenance category.
- Increased corrective **rail maintenance** expenditure based on observed trends.
- Partially offset by \$7.6m continuous improvement efficiencies and labour efficiency initiatives embedded in the Direct Maintenance Cost Budget.

Table 1 FY27 Final Draft Proposal - Direct Maintenance Cost Budget (\$m)

System	FY26 Approved Budget	FY27 Final Draft Budget
Direct Maintenance Costs		
Blackwater	84.0	86.1
Goonyella	78.7	82.1
Moura	18.0	20.0
Newlands/GAPE	16.1	20.4
Total (excluding ballast undercutting plant depreciation)	196.7	208.6
Ballast undercutting plant depreciation	6.0	6.0
Total Direct Maintenance Costs	202.7	214.6
Non-Coal Allocation	(1.2)	0.0
Total CQCN	201.6	214.6

Note: Figures may not add due to rounding.

1.3 Renewals Budget

The proposal also includes a **renewals budget of \$363.2 million**. A total of 746 scope items has been identified for the renewal of between 0.04% to 7.3% of system assets (by asset category) with an average future condition of 4.19 which indicates very poor to failed condition.

The FY27 Final Draft Proposal is \$40.8 million above the FY26 Budget.

This increase is driven by:

- Scope and higher costs in **Permanent Way, Civil Renewals, Electrical and Control System** renewals.
- Partially offset by reductions in **Ballast Cleaning and Structures**.
- Inclusive of \$12.9m continuous improvement initiatives and labour efficiency initiatives embedded within the FY27 Renewal Budget.

Table 2 FY27 Final Draft Proposal - Renewal Budget (\$m)

System	FY26 Approved Budget	FY27 Final Draft Budget
Blackwater	127.7	153.6
Goonyella	133.3	148.4
Moura	29.6	23.0
Newlands/GAPE	31.8	38.1
Total CQC	322.4	363.2

Note: Figures may not add due to rounding.

2 Overview of the FY27 MRSB Final Draft Proposal

Aurizon Network's FY27 Final Draft MRSB for the CQCN outlines a plan to deliver a safe, reliable, and cost-effective rail network aligned with UT5 regulatory requirements. The proposal includes a maintenance budget and a renewals budget for each of the Blackwater, Goonyella, Moura, and Newlands/GAPE Systems, supported by risk management, stakeholder engagement, and procurement frameworks.

2.1 Proposal Structure

Each annual MRSB proposal provides information to inform the approval process of the Final Draft Maintenance Strategy and Budget and Final Draft Renewal Strategy and Budget for each Coal System, consistent with the requirements of Part 7A.11 of UT5. As such, the MRSB is sectioned into three parts outlined below.

- 1. Overarching information regarding Maintenance and Renewals Strategy and Budgets for the whole CQCN.** Specifically, this includes:
 - Aurizon Network's asset management strategy for maintenance and renewals across the CQCN, informed by legislative and regulatory obligations, safety management system considerations and asset management policies.
 - Stakeholder engagement for the development of the FY27 Final Draft Proposal.
 - Key improvements and efficiencies planned to deliver material impacts as well as operational benefits across the entire Works End to End process (see Appendix 6 – Works End to End Process for more information).
 - Risk management methodology applied to the estimation and delivery of scope assisting with the planning of uncertainties and potential obstacles, better resource allocation as well as budgeting and timeline adjustments.
 - Goods and services procurement plan underpinned by environmental, social and governance considerations that builds resilience and capability to support value driven business outcomes.
 - Next steps in the approval process of the FY27 Maintenance and Renewals Strategies and Budgets for each Coal System in the CQCN.
- 2. Coal System-Specific Maintenance and Renewals Strategy and Budgets.** This includes a section for each coal system, specifically Blackwater, Goonyella, Moura, Newlands and GAPE, covering:
 - Asset Management Strategy, including four-year average trend insights, condition and criticality assessments informing scope selection
 - Renewals scope variance analysis against the FY26 Budget and the indicative forecast for FY27 (included in the FY26 MRSB)
 - Renewals Budget
 - Maintenance Budget

- Integrated Closures proposed for FY27
 - Four-year forward indicative forecast.
3. **Appendices** including information that compliments the budgets and strategies in the above two sections. This includes:
- The Detailed Scope Report, provided as a BI report and PDF, details the specific scope proposed to be completed at specific locations. This information helps highlight the location and necessity of the proposed scope.
 - Applications of the asset management strategies used in the CQCEN.
 - Strategies applied to each asset class for both maintenance and renewals as outlined in the Asset Maintenance and Renewal Policy to maintain reliability and deliver rail infrastructure efficiency and performance while seeking to ensure Committed Capacity or Deliverable Network Capacity can be achieved.
 - Key aspects for each program including maintenance, and renewal options and typical scope requirements.
 - Works End to End application to detail the process and other relevant information in the development of the MRSB from scope identification, access and works planning, budget setting and procurement, execution or delivery of the asset activity, reporting and engagement in these areas.
 - Additional information more widely related to each CQCEN corridor as well as governance and business practices of Aurizon.

2.2 Asset Strategy for Maintenance and Renewals in CQC

Aurizon Network’s application of maintenance and renewal strategies are designed to consider each stage of the asset’s life cycle.

The average age of the assets in the CQC is approximately 30 years, with most assets having been constructed during the 1980s and the 1990s. The average is reduced by deviations, duplications and spurs/balloon loops built during the 2000s and 2010s, and the asset renewals undertaken each year, noting that the annual renewals program represents a small percentage of the total network.

Maintenance of rail infrastructure refers to the inspection, testing, identification of faults and subsequent adjustment or repair of the asset.

Renewal of rail infrastructure refers to the design and/or replacement of an asset that is at its point in its asset life cycle where a renewal is required, or is obsolete, or is part of a strategic renewal program.

There are a wide variety of assets that make up the Rail Infrastructure. These assets wear and degrade at differing rates due to a variety of factors, which may include:

- location
- climate
- construction material
- use or movement (e.g., tonnage railed over a rail section)
- movements of mechanical parts; and
- obsolescence – either because operating systems are no longer supported, spare part availability or advances in alternate technologies.

Ultimately, maintenance and renewal work are undertaken seeking to balance cost, reliability and access as outlined in the guiding principles in Table 3.

Table 3 Guiding Principles of Maintenance and Renewal Work

Approach	Description
Asset Reliability – Provide reliable and safe rail infrastructure	Aurizon Network’s asset management strategy prioritises a preventive maintenance regime with fit for purpose renewal of Rail Infrastructure, based on asset condition and criticality and targeting performance and reliability consistent with 4-year averages. The identification, planning and rectification of faults seeks to minimise the impact of planned and unplanned failures. At all times, Aurizon Network’s approach seeks to mitigate the risk of rail incidents (such as derailments, dewirements or collision) that could result in serious injury, fatality or cause significant throughput losses or recovery costs.
Capacity – Seek to ensure that Committed Capacity is delivered	Aurizon Network seeks to ensure the asset is fit for purpose for the economic life of the corridor while minimising the impact of track possessions, supported by input from supply chain participants on outages and demand.
Be cost effective	Aurizon Network endeavours to ensure that the level of expenditure incurred to deliver the asset activity is reasonable.
Meet legislative requirements	Aurizon Network’s asset management strategy is developed within the context of the parameters set out by relevant legislative requirements including the Rail Safety National Law (Queensland) Act 2017 (RSNL), the Transport Infrastructure Act 1994 (Qld), the Work Health and Safety Act 2011 (Qld), and the Electrical Safety Act 2002 (Qld) and Security of Critical Infrastructure Act 2018.

2.3 Stakeholder Engagement

Aurizon Network has, in conjunction with stakeholders, developed a pattern of engagement to support the development of the MRSB each year. This engagement includes Aurizon Network’s obligations for engagement with the Rail Industry Group under UT5, as well as:

- The development of an engagement plan in February each year, subject to the approval status of the MRSB escalation to the RIG representative group or affected stakeholders on variations to the approved MRSB; and
- The publication of a Quarterly Report providing relevant information pertaining to Aurizon Network’s performance to plan in the current year of execution for each Coal System.

Collectively, the engagement comprises a series of presentations and consultation workshops aimed at providing information to the Rail Industry Group related to asset reliability in the CQCN, associated costs for maintaining and renewing these assets, access implications of doing so and performance to plan in executing the current year MRSB. Each engagement is also designed to provide an opportunity to the wider customer group to offer feedback, gain clarification and influence where possible, the development of the future year MRSB.

Figure 1 provides the 2025 schedule of customer engagements and high-level internal activities and milestones used to develop the FY27 MRSB. A description of these engagements is outlined below.

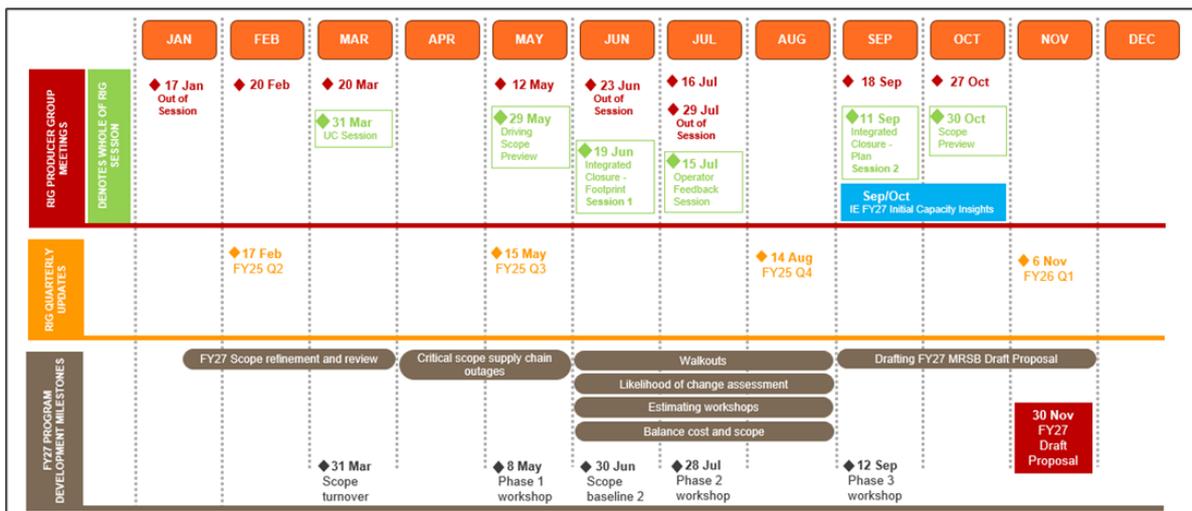


Figure 1 RIG Stakeholder Engagement Plan for FY27 MRSB Development

Rail Industry Group Producer Group Meetings

In February 2025, the Chair of the RIG advised Aurizon Network that the FY26 Final Draft Proposal (FY26 MRSB) had been approved by the voting members of the RIG. The approved FY26 MRSB included commitments to engage with the RIG during the development of the FY27 Final Draft Proposal, including the development of an annual engagement plan. The plan included engagement on various topics that were suggested and agreed by the RIG and Aurizon Network.

For the first time, the RIG also provided feedback and input into the priorities that support maintenance and renewals decision making between scope, access and cost within each corridor which was presented as each Coal System’s Decision Priority Matrix. Aurizon Network has been progressing these engagement topics with the RIG Producer Group, with updates on engagement provided in each Quarterly Report.

Quarterly Report and Forum/Updates

The RIG Quarterly Report provides a year-to-date performance snapshot against the approved plan as well as providing a summary of system reliability and efficiency of delivery.

The report is followed by the delivery of a quarterly forum highlighting key takeaways from the Aurizon Network team as well as providing customers and other stakeholders an opportunity to seek clarification.

Specific Consultation and Feedback Workshops

Aurizon Network’s decision making during the MRSB development process is informed by feedback received from customers through planned and/or informal engagements.

Figure 2 outlines each consultation workshop in the development of the MRSB, the outputs of each workshop as well as the input we sought from customers.



MRSB Process

Phase and Customer Engagement	What we know	What are the outputs	What we need from Customers
Driving Scope Preview (May) Priority scope for renewal	<ul style="list-style-type: none"> > Locations of where major work needs to occur > Draft durations and locations of driving scope 	<ul style="list-style-type: none"> > Driving path activity (renewals, BCM, bridge, culvert) > Draft MRSB Integrated Closure (mainline/ system & branch-line) Plan including timing and durations > Risks and opportunities within the draft plan (to be managed throughout process) 	<ul style="list-style-type: none"> > Feedback on draft Integrated Closure Plan, including timing durations > Alignment opportunities > Additional risks and opportunities for specific operations
Phase 1 (June) Location and critical path Integrated Closure Footprint Session 1	<ul style="list-style-type: none"> > Track characteristics of locations (e.g. single line/ bridge/culvert/high gradient) 		
Operator Feedback Workshop (July) Feedback from Phase 1 Informing Phase 2	<ul style="list-style-type: none"> > High level project scope and design > Support activities required (resurfacing, track protection, isolations etc) > High-level resourcing requirements 	<ul style="list-style-type: none"> > Single line possessions outside of Integrated Closures including locations and timing > Single line possession supply chain alignment > Adjustments to Phase 1 draft Integrated Closure Plans > Initial System and Network Capacity assessments 	<ul style="list-style-type: none"> > Operator workshop to consider any feedback from Phase 1, for Phase 2* > Feedback on high level System and Network Capacity assessments > Review/feedback on items raised in Phase 1 (e.g. durations, risks, opportunities)
Phase 2 (July) Initial design and resourcing			
Integrated Closure Footprint Session 2 (September)	<ul style="list-style-type: none"> > Detailed project scope and design > Delivery method, Procurement methodology 	<ul style="list-style-type: none"> > Refinements to previously assumed possessions: <ul style="list-style-type: none"> > Locations, Durations, Alignment > Baseline plans (internal output) 	<ul style="list-style-type: none"> > Feedback on highlevel system and capacity assessments > No feedback required (internal process work planning and delivery)
Phase 3 Detailed design and delivery			
Scope Preview (October) Renewal and Maintenance Overview	<ul style="list-style-type: none"> > Draft Maintenance budget > Draft renewal budget > Draft UC Forecast 	<ul style="list-style-type: none"> > Draft MRSB publication 	<ul style="list-style-type: none"> > Final feedback for Draft MRSB prior to submission.
Draft MRSB Publication (November) Submission of Draft MRSB			

Figure 2 Customer Consultation Workshops in the Development of the MRSB

In addition to the customer engagements specific to each phase of the MRSB development, a focus for the Aurizon Network team in the FY27 MRSB development was to understand areas for improvement around the MRSB development process, stakeholder engagement, the resultant strategy and budget output and reporting against performance to plan. This resulted in adopting a consultative approach with customers to learn key drivers of value around the MRSB as well as the gaps and shortfalls in the process and outputs. Consequently, a different approach to the development, presentation and reporting of the maintenance and renewal strategy and budget has been adopted this year that endeavours to improve customer understanding of the key components for approval as well as achieve efficiencies around the document development and this will continue to evolve based on further customer feedback.

2.4 Improvements and Efficiencies

Aurizon Network remains committed to promoting supply chain stability and enhancing the competitiveness of the CQC in the global marketplace. To support this, a range of initiatives are being identified, trialled and implemented to optimise the delivery of maintenance and renewal programs. While some initiatives deliver measurable financial efficiencies, others provide operational value through improved reliability, reduced downtime, and enhanced safety outcomes.

During 2025, Network has been actively identifying opportunities for improvement across the business. This has involved:

- Labour Efficiency & Effectiveness Review** – PwC performed a review of the Electrical discipline in conjunction with Network Operations and the RIG to identify opportunities for productivity uplift and cost reduction.
- Non-Operational Cost Base Review** – In response to market conditions, Aurizon engaged BCG to assist with an assessment of the non-operational cost base. The review focussed on identifying efficiencies in the non-operational parts of the business and included a review of support labour (primarily non-EA roles) and external spend.

Figure 3 summarises the maintenance and renewal program efficiencies being targeted across FY26 and FY27.

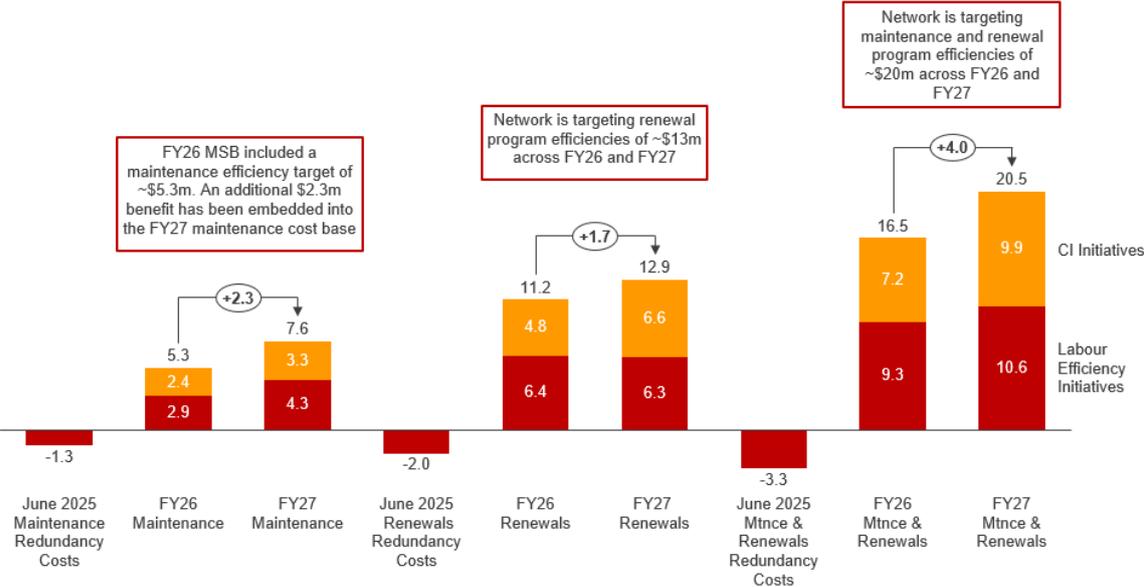


Figure 3 FY27 Targeted Cost Efficiencies (\$m)

Labour Efficiency Initiatives

In June 2025, Network executed a number of labour efficiency initiatives. This involved the rationalisation of ~60 roles (~6% of workforce). These initiatives were across the Network Operations and Network Assets disciplines, with a focus on consolidation of support and planning roles as well as process improvement identified through both the Labour Efficiency and Effectiveness Review and the Non-Operational Cost Base Review. Targeted labour savings associated with these labour initiatives across FY26 and FY27 are \$10.6m.

Aurizon Network has prioritised four initiatives from the Labour Efficiency and Effectiveness review which are in implementation, summarised in Table 4. As outlined above, Aurizon Network rationalised roles with the Electrical function able to rationalise approximately 20 FTE, delivering an overall benefit over three years of approximately \$3.8m. This reduction in FTE reflects the cumulative impact of various labour efficiency and improvement focus areas and is not intended to represent a discrete or isolated valuation attributable to any individual activity. Rather, the benefit has been realised through the combined and interdependent effects of the initiatives.

Table 4 Labour Efficiency Initiatives

Initiative/	Description	Progress	PWC Valuation
Streamline Maintenance and Asset Plans	Review and streamline maintenance plans to remove low value tasks 'unnecessary' work without impacting safety, compliance or acceptable network performance.	The Electrical team are now streamlining maintenance plans in the Telecommunications teams. This is embedded as BAU.	\$222K
Maintenance Optimisation	Align maintenance schedules with maintenance strategies and work prioritisation rules.	The Electrical team have commenced a trial in the Signalling team with the support of Safety Culture to align maintenance schedules.	\$80K
Fill in Work Definition	Improve overall productivity by identifying and communicating activities and time writing requirements for tasks to be performed with while waiting for trains.	This has now been embedded into BAU across the Electrical teams.	\$139K
In Field Forms	Development of digital maintenance forms and work instructions enabled by the existing Safety Culture app to broader electrical system team.	This has now been embedded into BAU across Electrical teams and with other disciplines with the support of the Safety Culture application.	\$395K

Continuous Improvement Initiatives

The above initiatives identified in the Labour Efficiency and Effectiveness review form part of the wider Continuous Improvement focus of Aurizon Network. Savings of approximately \$10m are being targeted in FY27. Table 5 provides an overview of the key initiatives being pursued. Updates on these initiatives will be reported to customers on a quarterly basis. These initiatives form part of a broader pipeline of Continuous Improvement Initiatives that Aurizon Network will continue to develop and implement through future MRSB Programs as part of our commitment to optimise the delivery of maintenance and renewal programs.

Table 5 FY27 Continuous Improvement Initiatives

Initiative	Description	Total Cost of Efficiencies Embedded in FY27 MRSB		Progress
		Maintenance	Renewals	
All Corridors Wet Hire Review	Negotiate rates below wet hire rates through packaging scope and testing with multiple vendors. Includes packaging ballast delivery / earthworks for the ballast renewal program.	0.2	5.2	Expected to be completed by Q4 FY26, with benefits for FY27.
Blackwater System	Exploring change from 7-day coverage to Mon - Fri coverage	0.3	0.1	Commenced Q2 FY26. Full implementation

Initiative	Description	Total Cost of Efficiencies Embedded in FY27 MRSB		Progress
Civil Roster Changes	Gracemere to reduce weekend penalty and full overtime shifts. Potential to impact response times on weekends.			expected by Q3 FY26 with benefits to be realised in FY27.
All Corridors Small Maintenance	Plant Redeploying internal labour to manage rail deliveries, allowing fitters to undertake small plant maintenance, reducing contractor costs.	0.3	0.2	Commenced upskilling required to redeploy internal labour. Two depots complete, outstanding depots and contractor roll-off through Q4 FY26 and Q1 FY27,
All Corridors Consumables (5%)	Targeted consumable reduction across all areas and reduction in overtime.	0.9	0.8	In Progress – Requires ongoing cost management.
All Corridors Vegetation contractor reduction	Re-tender vegetation contracts in addition to alternative vegetation methods (aerial herbicide application) resulting in contractor cost reductions.	0.5	-	Alternate vegetations methods have commenced in Moura, Goonyella and Newlands. Blackwater to commence Q4 FY26, weather dependent. Contracts executed for H1 FY27. H2 tenders to commence Q2 FY27.
All Corridors Light Vehicle Review	Optimise current fleet size based on utilisation, with subsequent reductions in vehicle replacement strategy.	0.3	0.2	Review of fleet to be finalised Q3 FY26. Expected to execute reduction in fleet starting Q4 FY26, with full benefit realisation through FY27.
Other Initiatives	Other identified initiatives delivering efficiencies.	0.8	0.1	To be scoped Q4 FY26 / Q1 FY27.
Heavy Vehicle Review	Review current fleet size based on utilisation with the intent to reduce costs and optimise replacement strategy.	Yet to be scoped	Yet to be scoped	FY27
Resource Planning	Improve resource utilisation and maximise access taken across the CQCN.	Yet to be scoped	Yet to be scoped	FY27
Total		3.3	6.6	

Considerations and Improvement in Delivery Methodologies

Through lessons learnt over several years of delivering the MRSB scope and improvements either developed internally or brought to Aurizon via its contracted delivery partners, several improvements are evident in the development of the FY27 scope and subsequent delivery planning. Table 6 calls out these improvements and how these are expected to manifest in FY27 delivery.

Table 6 Improvements Considered in FY27 MRSB Delivery

Initiative/Improvement	Detail	How it will Manifest
Grouping like scope items	With visibility of multiple years of scope in the planning phase, like items have been grouped together. For example, turnout undercuts in FY27 are being planned for delivery as “Nests” of turnouts. That is, up to 4 turnouts in the same station location being completed together in one track closure.	<ul style="list-style-type: none"> • Lower unit rate per activity due to reduced site planning and set up. • Lower work time per asset.
Grouping different scope types to locations	In the planning phase looking at a scope from different programs allows more than one renewal to be grouped together. For example, in FY27 several sites see both level crossing renewals and culverts renewals in the same location being planned and executed as a single “site” project.	<ul style="list-style-type: none"> • Lower unit rate due to sharing site costs and planning costs. • Less access taken per locations as works being completed together.
Value engineering	This approach involves the Project Manager coordinating a multidiscipline planning review that looks beyond the immediate asset renewal to identify additional works at the site, aiming to avoid returning in future years for separate activities. For example, when undertaking a re-rail at a load out, also complete the weighbridge renewal and upgrade a level crossing. Focus in FY27 on Turnouts and Track Upgrade scopes.	<ul style="list-style-type: none"> • Avoid closures of track section across multiple years. • Reduces the rate per activity due to coordinated planning and site management.
New construction methodology – Pannel Lifters	Leveraging our contractor’s investment in new technologies or via market scan or alternate delivery methods, Aurizon is utilising track Panel lifters to complete formation renewals and turnout undercutting in a more efficient and safer manner. This technology is a series of remote-controlled heavy lift machines that can move track panels and whole turnouts in sections. The result is a better-quality delivery, less people machinery interactions and a time saving on the activity.	<ul style="list-style-type: none"> • Faster delivery of task that may reduce track access requirement. • Safer delivery.
Drainage as a focus in all works delivery	The asset renewal and maintenance works puts earth moving plant into the rail corridor. Through improved focus and planning this machinery can be tasked to improving drainage at sites when not being used to contribute to the works. For example, a front-end loader on site to move materials can be used to clean and shape drainage when not on task.	<ul style="list-style-type: none"> • Improved drainage at renewals sites. • Better plant utilisation. • Less ongoing track issues aligned to drainage at renewed sites.
Increase cost competitiveness amongst contractors – OHLE	Through a targeted market scan and the separation of the FY25 and FY26 scopes into smaller packages, Network has invited and tested the cost and quality delivery of an increased pool of electrical Over Head contractors. This has introduced 3 new vendors to the CQ market and increased the contractor pool and improved cost and quality outcomes.	<ul style="list-style-type: none"> • Lower delivery costs and increased quality of works.

Initiative/Improvement	Detail	How it will Manifest
Internal delivery focus	Moving some products that were traditionally delivered by external contractors including site planning and delivery managed, Network has delivered works at a lower total cost through the avoidance of contractor margins. This has been successful in FY26 in the Level crossing and Formation programs and will be continued in FY27.	<ul style="list-style-type: none"> • Lower unit rate delivery via avoidance of commercial margins.
Reduction in Integrated Closure (IC) hours GA and BW	We have maximised the scope incorporated into IC's while reducing IC hours in Goonyella and Blackwater. The current strategy focuses on optimising the scope, resource utilisation, and operational efficiency.	<ul style="list-style-type: none"> • Should unplanned additional scope need to be included, they may be managed by substituting them for planned scope.

2.5 Treatment of Uncertainty and its Influence on Full Year Delivery

Renewal Program

Aurizon Network notes that the development of the renewals scope in the MRSB is an iterative process. The timeline from scope identification to the MRSB submission can be up to 11 months, with scheduled scope execution up to 18 months following approval. During this period, asset conditions may change and estimates for cost and time continue to mature from the point of MRSB submission to the future delivery date.

Given this time differential, there is an inherent level of uncertainty between the budget presented in the MRSB and the actual delivered cost. This uncertainty reflects the potential impact of delivery risk and opportunities on the final scope, cost and access requirements. As the scope and estimate continue to evolve post-submission, these risk and opportunities may result in either negative impacts (risks) or positive outcomes (opportunities).

As a result of the known uncertainty, the Budget for renewals presented in the MRSB should be considered a forecast of expected costs at the time of submission, rather than a fixed cost. In the FY27 MRSB, Aurizon Network has provided customers with both the budget and a range of potential cost outcomes, reflecting the level of uncertainty associated with each program across each system. This approach positions the budget supported by a high and low-cost estimates based on the assessed uncertainty.

Aurizon Network presents the value range as a class of estimate adapted from international industry standards. The Class of estimate reflects the maturity of the project scope, planning, and design, and is expressed as a percentage range (+/-) around the budgeted cost. During the execution of the planned scope, there are multiple possibilities of the various risks and opportunities either being realised, mitigated or not eventuating. The banding represents the following:

- The upper bound (+) represents the probabilistic high range of the expected spend.
- The lower bound (-) represents the probabilistic low range of the expected spend.

Whilst these bands cannot reflect all potential scenarios; this approach is intended to reflect the level of uncertainty and potential variability in cost outcomes based on project maturity and delivery.

Table 7 Class Value Range of Project Maturity

Estimate Class	Expected Accuracy Range (Typical variation from budget in high and low ranges)
Class 5	-20% / +30%
Class 4	-15% / +20%
Class 3	+/- 10%
Class 2	+/- 5%
Class 1	+/- 3%

At the time of MRSB submission, all risk and opportunities are in a Potential status. As the scope and estimate continue to mature through to delivery, these risks and opportunities will either be Realised, Mitigated or Cancelled. Weather related delivery risks have not been considered, however the closure pattern in the year of delivery sees significant works planned for the first 4 months of the MRSB period to take advantage of drier conditions ahead of the summer season. This results in nearly 65% of the Aurizon Network – FY27 Final Draft Proposal for the Maintenance and Renewals Strategies and Budgets Commercial-in Confidence

planned works completed prior to H2. This does create some opportunity to replan cancelled works from weather events or other unforeseen risks. As the program moves to the second half of the financial year, the opportunity to recover lost works is greatly reduced. If planned works cannot be recovered, then the works will be assessed and replanned for a future renewal opportunity.

Maintenance Program

The annual maintenance and renewal program for the CQCN requires the planning and execution of a significant number of discrete asset activities every year. Aurizon Network must carefully balance a number of competing priorities to ensure that it can meet its contractual obligations to customers, but also promote the ongoing safety, reliability and performance of the Rail Infrastructure for an efficient cost.

A variety of factors (both external and internal) may present during or prior to execution, that may impact the delivery of planned works. Such factors may include (but are not limited to) customer demand, weather, asset condition/deterioration, site specific challenges or constraints, availability of labour and materials and machine breakdown.

There are circumstances where work is reprioritised, or the infrastructure condition requires a higher or lower level of effort to rectify or maintain. In such instances and in accordance with several standards across asset categories, scope may be reprioritised as required, with consideration of resourcing requirements, capacity and reliability impacts.

Maintenance Labour Activity Mix Sensitivity

The budgeting approach for maintenance varies according to the nature of the asset activity. While some activities, such as mechanised production and preventative maintenance activities are predictable and have a clearly defined scope, other activities are corrective which results in Aurizon Network using historic expenditure levels to inform annual budget forecasts. This can create a level of variation where current infrastructure needs vary from historic levels.

The labour cost allocations reflected in the FY27 Final Draft Budget are a function of both system and activity mix assumptions, with corrective and renewal activity levels largely informed by historical actuals between FY23 to FY25. Aurizon Network does expect a level of variation in labour allocations across programs, as compared to levels included in the approved budget.

Figure 4 shows the impact on maintenance costs of a 2% variation in activity mix levels across all disciplines, based on expected levels of activity for FY27.

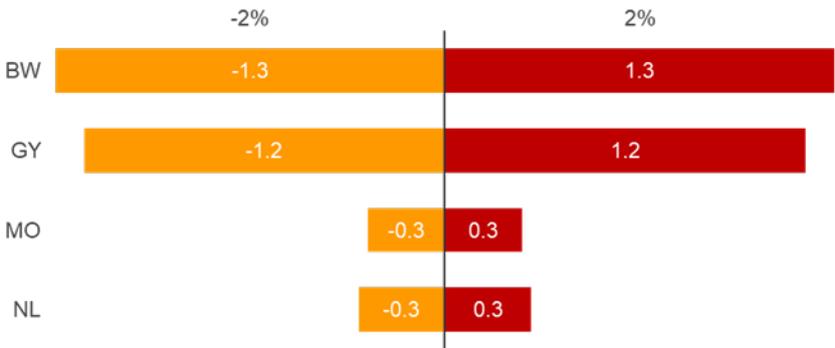


Figure 4 Maintenance Labour Activity Mix Sensitivity (\$m)

Table 8 summarises potential sources of variation between Aurizon Network’s budgeted and actual maintenance costs. These risks and opportunities will be monitored throughout FY26 and FY27.

Table 8 Risk Opportunity Considerations

Risk Opportunity	Description	Comments/Mitigation
Rail Maintenance	Risk that corrective activity levels are higher or lower than that assumed in the budget. FY27B has been based on FY25A activity levels.	<ul style="list-style-type: none"> Monitoring and review of defect data and insights. Development of predictive capability for use in future MRSBs.
Vegetation Strategy	Variation in benefits assumed following transition to granular herbicide vegetation management approach and internalisation of vegetation work in specific districts. Post deployment, benefits may be delayed or accelerated pending success of application and external factors (e.g. weather).	Ongoing management of the vegetation contracts (cost and scope), reactive/safety critical scope and utilisation of internal resources.
Retention	Variation in FTE requirements which may include higher FTE following improved retention outcomes vs lower FTE which may require contractor or labour hire support to manage work levels.	<ul style="list-style-type: none"> Western Depot allowance. Consideration of alternate roster strategies – Drive In Drive Out Commute Mode Transition to retirement options.
FY26 Efficiencies	FY27 Final Draft Budget reflects delivery of embedded efficiencies of \$5.3m to be executed in FY26.	Initiatives are on track. Timing and final benefits to be monitored.
Material Prices	Variation in material prices across ballast, signalling and electrical components and other materials. FY27 Final Draft Budget based on a weighted average escalation factor using various indices.	Internal Procurement and Inventory Management processes.
Resource Management	Ongoing improvement initiatives to support resource management.	Encompassing reviews of systems and processes.

2.6 Goods and Services Procurement

Aurizon Network recognises the importance of building resilience and capability to support sustainable, equitable and risk-informed business practices and this includes the way in which goods and services are procured. Aurizon procures in accordance with its procurement governance management framework which outlines the systems, documentation, compliance mechanisms, and improvement processes underpinning activities to procure goods and services across the enterprise (see Appendix 6 – Works End to End Process for more information).

To support the delivery of the FY27 MRSB as well as the delivery planned for future years, Table 9 outlines the Goods and Services that:

- have already been contracted in preparation for FY27 delivery activities
- are targeted for procurement activities during FY27; and
- items that have multi-year sourcing strategies.

For transparency, Aurizon Network will engage with the Rail Industry Group on any procurement items that:

- require a multi-year sourcing strategy
- have a value exceeding \$1m; or
- result in engagement with a related party.

Exclusions to the above include sourcing events for Enterprise arrangements (e.g. fleet management, PPE, consumables), arrangements that are scope specific and to be executed within the financial year, panel arrangements (e.g. wet-hire, ballast) and annual civil asset renewal sourcing.

Table 9 FY27 Procurement Plan

Goods/Services	Procurement Activities Planned for FY27	RIG Engagement Required	FY27 Contracted	FY28 Contracted	FY29 Contracted	FY30 Contracted
Maintenance						
Rail Grinding #			Y	Y	Y	Y
Electricity			Y	Y	Y	Y
Ultrasonic Testing	Y	Y				
Asset Renewals						
Permanent Way						
Supply of Sleepers			Y	Y	Y	
Supply of Turnouts #			Y	Y		
Supply of Rail Fasteners and Welt Kits #			Y	Y		
Supply of Rail	Y	Y				
Ballast Cleaning Renewal Program						
Pre Strip and Earthworks #			Y	Y	Y	

Goods/Services	Procurement Activities Planned for FY27	RIG Engagement Required	FY27 Contracted	FY28 Contracted	FY29 Contracted	FY30 Contracted
Excavator Undercutting #			Y	Y	Y	
Rail Management #			Y	Y	Y	
Ballast Delivery and Spoil Removal #			Y	Y	Y	
Supply of Ballast			Y	Y		
Civil Assets						
Formations			Y	Y		
Access Points and Roads #			Y	Y	Y	Y
Culvert – renewal, replacement, relining	Y	Y				
Bridges	Y					
Level Crossings	Y					
Supply of Pre-Cast Culverts	Y	Y				
Electrical Assets						
Traction (OHLE) Services	Y					
Supply of Autotransformers			Y			
Substation Renewal (pending endorsement)	Y	Y	Y	Y		
Supply of Steelwork and Cable	Y	Y				
Control Systems						
Low Voltage/Extra LV Design and Construct #			Y	Y	Y	
Signal Interlocking			Y			
Cabling, Pit and Pipe Foundations #			Y			
Supply of Weighers			Y	Y		
Cable Jointing Services	Y	Y				
Telecommunications Support Services	Y	Y				
Tower Design and Construction	Y	Y				
Network Monitoring Services	Y	Y				
Design/Consultancy						
Cable Route Design #			Y	Y	Y	
Asset Protection #			Y	Y	Y	

Goods/Services	Procurement Activities Planned for FY27	RIG Engagement Required	FY27 Contracted	FY28 Contracted	FY29 Contracted	FY30 Contracted
Geotechnical	Y	Y				
Points and Crossings	Y	Y				
Level Crossings	Y	Y				
Other						
Wet Hire Panel			Y			
Labour Hire Panel			Y			
Engineering Services Panel			Y			

Sourcing activities being completed during FY26

Furthermore, in line with Aurizon’s procurement practices, Aurizon Network is committed to minimising impact and interaction with the environment and effectively managing its environmental performance and risk. Aurizon Network continues to prioritise the safety, health and well-being of our people, as well as the safety and environmentally sustainable operation of our business in a way that minimises our impact on Indigenous and non-Indigenous cultural heritage.

Aurizon’s Governance, Risk and Assurance Framework defines enterprise-wide expectations of governance, risk and assurance processes and activities, including responsibilities across key stakeholder groups.

The Board and, in turn, Aurizon management give effect to the frameworks and policies designed to identify and manage risks. This includes consideration of inherent risks as well as contemporary or emerging risks, such as conduct risk, digital disruption and cyber risks, and climate and sustainability risks.

Further information on the above can be found in Appendix 6 – Works End to End Process as well as the 2025 Sustainability Report, 2024 Annual Report, 2024 Modern Slavery Statement and 2022-2025 Reconciliation Action Plan. Links to these documents are accessible from Table 112 in Appendix 7 – Additional Information.

2.7 General Assumptions

To prepare the FY27 Final Draft Proposal, Aurizon Network has relied on the following assumptions applied to the asset maintenance and renewal for all four systems of Blackwater, Goonyella, Moura and Newlands and GAPE.

Assumptions that are system-specific are called out separately in the relevant sections of this document.

Table 10 FY27 MRSB General Assumptions

Category	Assumption
Finance	<ul style="list-style-type: none"> • Only Direct Maintenance Costs are included in the FY27 Final Draft Proposal. • Value of asset renewals reflects forecast capital expenditure for FY27 delivery, which may differ from the values that Aurizon Network will seek to include in the Regulated Asset Base (RAB) via the Annual Capital Expenditure Claim, which reflects the cost of assets that have been commissioned during the financial year. • Costs are based on required scope, historical data, and site-specific factors. Average unit costs may not fully reflect site conditions or scheduling inefficiencies. • Figures displayed in various tables, charts and graphs throughout the document may not add due to rounding. • No cost provisions have been included for infrastructure repair due to extreme weather and/or other Force Majeure Events. If such events occur, Aurizon Network will seek QCA approval to recover costs under UT5 Schedule F, Clause 5.3. • FY27 means financial year 2027, commencing on 1 July 2026 and ending on 30 June 2027. • In prior years, a deduction for Non-Coal costs was reflected within the draft budget. The FY27 final draft budget excludes all costs expected to be incurred on Rail Infrastructure that is solely utilised by non-coal train services. To the extent that Aurizon Network incurs costs on Rail Infrastructure utilised by both coal and non-coal train services, the share of actual costs attributable to non-coal train services will be deducted from Aurizon Network's maintenance costs claim.
Threshold for Variation	<ul style="list-style-type: none"> • UT5 Clause 7A.11.5(f)(ii)(B)(2) defines what constitutes an 'item' for cost variation assessments: <ul style="list-style-type: none"> ○ Moura, Newlands, GAPE entire maintenance budget ○ Blackwater, Goonyella: specific product areas ○ Other areas: grouped as single items.
Document	<ul style="list-style-type: none"> • Excluding any and all terms expressed to the contrary, capitalised terms have the meaning given in UT5. • When referring to Newlands or Newlands System, it is assumed inclusion of Newlands System and GAPE unless otherwise specified.

2.8 Next Steps

Following submission, the key milestones in relation to the FY27 Final Draft Proposal are outlined in Table 11.

Table 11 Regulatory Milestones Relating to the FY27 Final Draft Proposal

Date	Milestone	Description
30 November 2025	Draft Proposal Submission	Aurizon Network submits its FY27 Draft Proposal for each Coal System to the Chair of the RIG, Customers and non-coal Access Holders.
1 January 2026	Due date for feedback on the FY27 Draft Proposal	The Chair of the RIG, on behalf of End Users, may give Aurizon Network a notice which specifies amendments to the FY27 Draft Proposal that members of the RIG consider reasonably necessary (giving reasons).
21 January 2026	Aurizon Network submits FY27 Final Draft proposal	
14 February 2026	Notification of voting outcomes	The Chair of the RIG notifies Aurizon Network and the QCA as to whether a Special Majority of End Users for each Coal System has approved Aurizon Network's FY27 Final Draft Proposal.

2.9 New Information since 30 November 2025

The development of the annual maintenance and renewal strategy and budget is part of Aurizon Network's process to manage the rail infrastructure in a way that meets the Maintenance Objectives outlined in this section 7A.11 of the 2017 Access Undertaking. The draft proposal submitted by 30 November each year to the Rail Industry Group Chair takes into consideration the identification and assessment of scope that in some cases occurs up to 18 months prior to the submission date. Aurizon Network makes an informed assessment based on the available information, including the likelihood of change to the scope, cost and access impacts, for inclusion in each years' proposal.

Since 30 November 2025, Aurizon Network has continued to develop and review scope identified in the FY27 Draft Proposal. Consistent with section 7A.11(c)(iii) of the 2017 Access Undertaking, this section of the FY27 Final Draft Proposal provides an update to the members of the Rail Industry Group, non-coal Access Holders and Customers on new information in relation to the FY27 Draft Proposal that has become available between 30 November 2025 and 21 January 2026. The changes include additional renewal costs predominantly relating to full maturity of the estimate for four turnout renewals at Praguelds, as well as the Boonal Transfer Facility Design scope being moved from FY26 to FY27. These increases were offset by reductions due to the Moorvale Transfer Facility works being completed in FY26, the Boonal Transfer Facility Construction being moved to FY29 and rerail from Yukan to Black Mounting being completed in FY26.

The changes result in a \$2.4m increase in asset renewal expenditure with asset maintenance expenditure remaining the same.

The tables below provide a summary of all changes to the FY27 Draft Proposal based on new information and the associated forecast variance.

Table A Changes to FY27 Draft Proposal – Forecast Cost Impact (\$m)

System		FY27 Draft Proposal – Nov 25	FY27 Final Draft Proposal – Jan 26	Variance (\$m)
Blackwater	Maintenance	86.1	86.1	0
	Renewals	154.0	153.6	(0.4)
	System Total	240.1	239.7	(0.4)
Goonyella	Maintenance	82.1	82.1	0
	Renewals	145.6	148.4	2.8
	System Total	227.7	230.5	2.8
Moura	Maintenance	20.0	20.0	0
	Renewals	23.0	23.0	0
	System Total	43.0	43.0	0
Newlands	Maintenance	20.4	20.4	0
	Renewals	38.1	38.2	0
	System Total	58.5	58.5	0
CQCN Total		569.3	571.7	2.4

Maintenance expenditure reflected above is exclusive of ballast plant depreciation.

Table B Changes to FY27 Draft Proposal from new information detail

Section Reference	Description/Reason for Change	Impact on FY27 Draft Proposal Forecast (\$m)
2.4 Improvements and Efficiencies	Figure 3 FY27 Targeted Cost Efficiencies (\$m) updated showing redundancy costs.	\$0
	Table 4 Labour Efficiency Initiatives and preceding commentary updated to show PWC valuation.	\$0
	Table 5 Progress column has been updated with further detail for each initiative. Initiatives with planned start date in FY27 have been added.	\$0
2.9 New Information since 30 November 2025	New section added outlining changes to the Draft Proposal since 30 November 2025.	Impact summarised in Table A above.
3.1 Asset Management Strategy – Blackwater System	Clarification to Table 12 for the Network Cyber Security Project. This project will undertake the transition of Operational Technology systems to the segregated environment, migrating 24 systems. The FY27 budget only provides for delivery of Stage 1, which includes priority mission critical systems (7 of the 24 systems). Engagement with customers is planned in FY26 and FY27 on options to deliver later stages.	\$0
3.2 Renewals Budget – Blackwater System	Table 14 minor updates to several scope items.	(\$0.4)
	Additional risk added to Renewals Opportunities and Risks for the Blackwater System. The delivery approach for the Track Upgrade scopes at Westwood-Windah, Rocklands-Gracemere and Parnabal-Walton is still in development due to the complexity of accessing these sites within an embankment/cutting.	\$0
3.4 Integrated Closure Plan – Blackwater System	Table 23 updated with driving path activities.	\$0
4.1 Asset Management Strategy – Goonyella System	Clarification to Table 26 for the Network Cyber Security Project. This project will undertake the transition of Operational Technology systems to the segregated environment, migrating 24 systems. The FY27 budget only provides for delivery of Stage 1, which includes priority mission critical systems (7 of the 24 systems). Engagement with customers is planned in FY26 and FY27 on options to deliver later stages.	\$0
	Figure 25 commentary updated related to electrical incident performance trends.	\$0
4.2 Renewals Budget – Goonyella System	Update to track upgrade from 41.598 rail km to 40.828 rail km.	Impact included in Table 28
	Table 28 minor updates to several scope items.	\$2.8
	Table 30 updated to include scope variations for Praguelds turnouts as well as additional information on scope variation for Control Systems.	Impact included in Table 28
	Figure 30 updated to include maturity of estimate for Praguelds turnouts.	Impact included in Table 28

Section Reference	Description/Reason for Change	Impact on FY27 Draft Proposal Forecast (\$m)
	<p>Additional risk added to Renewals Opportunities and Risks for the Goonyella System.</p> <p>The delivery approach for the Track Upgrade and Rerail scope at Wandoo-Waitara, is still in development due to the complexity of accessing the site within an embankment.</p>	\$0
4.4 Integrated Closure Plan – Goonyella System	Table 37 updated with driving path activities.	\$0
5.1 Asset Management Strategy – Moura System	<p>Clarification to Table 40 for the Network Cyber Security Project. This project will undertake the transition of Operational Technology systems to the segregated environment, migrating 24 systems. The FY27 budget only provides for delivery of Stage 1, which includes priority mission critical systems (7 of the 24 systems). Engagement with customers is planned in FY26 and FY27 on options to deliver later stages.</p> <p>Figure 37 clarification regarding elevated performance trends over four-year average in Moura System.</p>	\$0
5.4 Integrated Closure Plan – Moura System	Table 51 updated with driving path activities.	\$0
6.1 Asset Management Strategy – Newlands System and GAPE	<p>Clarification to Table 54 for the Network Cyber Security Project. This project will undertake the transition of Operational Technology systems to the segregated environment, migrating 24 systems. The FY27 budget only provides for delivery of Stage 1, which includes priority mission critical systems (7 of the 24 systems). Engagement with customers is planned in FY26 and FY27 on options to deliver later stages.</p>	\$0
6.2 Renewals Budget – Newlands System and GAPE	<p>Additional risk added to Renewals Opportunities and Risks for the Newlands and GAPE System.</p> <p>The delivery approach for the Track Upgrade and Rerail scopes at Durraburra-Kaili and Briaba-Collinsville is still in development due to the complexity of accessing these sites within an embankment/cutting.</p>	\$0
6.4 Integrated Closure Plan – Newlands System and GAPE	Table 65 updated with driving path activities.	\$0
Appendix 8 – Glossary	Included definition for Incident.	\$0

3 Blackwater System

Blackwater System Summary	
Blackwater Asset Management Strategy	Maintain a stable level of service by keeping asset condition steady over time through a condition-based renewals program with preventative and corrective maintenance.
Guidance for Decision Priorities	<p>In determining the trade-off decisions for the renewal programs the following prioritisation has been considered, after discussion with the Rail Industry Group:</p> <ol style="list-style-type: none"> 1. Scope 2. Cost 3. Access <p>Prioritisation is based on assumptions that demand would be steady and lower than Committed Capacity and infrastructure reliability is improving with steady performance impact.</p>
Renewals Budget	<p>Asset Renewals of \$153.6m to renew between 0.2% and 7.3% of system assets with an average condition 4.12 (very poor) and assumes delivery of targeted efficiencies identified in FY26.</p> <p>Compared to the indicative forecast for FY27 included in the FY26 Budget, FY27 renewals have increased by \$8.2m, predominantly due to maturing of estimates in Control Systems and an increase in assumed cost escalation.</p> <p>Compared to the FY26 Budget, FY27 renewals have increased by \$25.9m due to increases in civil asset scope with very poor condition and Control Systems which is reflective of the reduction in FY26 scope to provide stability in the delivery of the program year on year.</p>
Maintenance Budget	<p>Direct Maintenance Cost Allowance of \$86.1m (excluding ballast undercutting plant depreciation) and assumes delivery of targeted efficiencies identified during FY26. General Track maintenance, Signalling & Telecoms and Resurfacing activities represent 63% of the system spend.</p> <p>To maintain asset condition and reliability, a targeted drainage program has been included together with a higher level of maintenance activity to support General Track and Signalling & Telecoms Maintenance programs. The FY27 Final Draft Budget is \$2.9m higher than the FY26 Budget.</p>
Integrated Closures and Capacity Impact	<p>System has sufficient capacity to meet Committed Capacity and includes:</p> <ul style="list-style-type: none"> • Reduction in total mainline closure hours by 9% compared to FY26, with 6 planned Integrated Closures and a Gregory branch line closure. • Increase in single line activity with lower impact renewal activity planned outside of Integrated Closures.
Opportunity and Risks	At +/-10% estimate, Renewals upper and lower value range is \$169.5 and \$138.7.

3.1 Asset Management Strategy – Blackwater System

The asset management strategy for the Blackwater System is to maintain and renew assets to hold the condition of the assets steady over the longer term.

The Blackwater System is Aurizon Network’s oldest Coal System and the largest by track length. It primarily serves coal mines in the central and southern Bowen Basin, carrying product through to export ports in Gladstone, as well as domestic electricity generation and industrial users. The system also supports traffic originating in the northern coal systems via the Gregory Branch as well as freight and passenger services on both the North Coast Line (NCL) and Central Lines. The Blackwater System includes approximately 1,137km of electrified track.

Generally, the level of asset availability is expected to be consistent with prior years. In January 2025, demand for FY27 was estimated to be steady and lower than Committed Capacity. Noting that the Usable Capacity target for FY27 has improved compared to previous years and the ACAR 2025 anticipated Available Capacity for the Blackwater system in FY26. Where a decision has been required to be made in the development of the Final Draft Proposal, the delivery of renewal and maintenance scope has been prioritised ahead of improving availability above Committed Capacity. The following is an example of this decision making for the Blackwater System:

- Yan Yan Ballast Undercutting (1.5km) was identified as potentially high impact to customers and recommended for deferral. On review, the decision was to retain the scope in FY27 on the basis that the condition was rated at 4.8 (Poor to Failed) and the renewal would improve future asset availability by removing the need for track isolation for ballast machine movements across systems.

Aurizon Network has excluded Maintenance and Renewal activity associated with the following track section from the FY27 Final Draft Proposal that are not currently utilised by Coal Train Services:

- The Central Line track section west of Burngrove (202.700km point west) approximately 65km,
- The Springsure Branch approximately 43km
- Rocklands North Coast Line (NCL) Mainline (approx. 3.97km) and adjacent Rocklands NCL Passing Loop (approx. 1,9km) to the North
- East End branchline (approx. 11.91km).

Asset Renewal Strategy – Blackwater System

Asset Renewals seek to renew or replace aged or degraded assets ahead of unplanned failure or obsolescence.

The Blackwater System is a mix of aged assets and newer assets installed as part of the Wiggins Island Rail Project (WIRP) in 2015, Blackwater duplications (2009) and Blackwater electrification projects (1987 and upgrade in 2012).

Table 12 Asset Profile – Blackwater System

Renewal Item	Comment
Civil Assets	The Blackwater System was originally built for steam freight and passenger services, with some formation and structures dating to the late 1800s. The rail infrastructure traverses flood-prone, variable soils, causing track alignment issues and weather-related speed restrictions during seasonal weather fluctuations, and higher track resurfacing and formation renewal activity than other systems. Upgrades in the 1990s and 2000s (e.g., WIRP, duplications) improved capacity but didn’t fully address aging

Renewal Item	Comment
	civil assets. Despite the aged infrastructure, renewals are condition-based, using observable condition and degradation pattern.
Control System Assets	WIRP and Blackwater duplications in the 2010s upgraded telecoms, wayside and train protection systems however aged control systems assets remain, especially on the NCL and west of Tunnel, including 1970s interlockings in Callemondah Yard and 1980s track circuits nearing end-of-life which are subject to ongoing renewals. The TETRA radio system was installed from 2020 and a program to modernise the optic fibre in Blackwater commenced in FY22 and continues in FY27. A Network Cyber Security Project has been established to deliver an industry aligned model that provides separate security zones for Information and Operational technology systems. The transition of OT Systems to the segregated environment requires the migration of 24 discrete systems structured into three stages to improve delivery efficiency, cost control and interface risk management. Stage 1 focuses on the migration of high priority mission critical systems (7 of the 24 systems, representing 29%). This approach reduces operational and cyber exposure as quickly as possible while establishing repeatable migration patterns that will inform more accurate cost and schedule estimates for subsequent stages. Accordingly, the FY27 budget only provides for delivery of Stage 1, with additional customer engagement to finalise the approach for Stages 2 and 3 planned in FY26 and FY27.
Electrical Assets	The Electrical assets were largely installed during the mid-1980's mainline electrification project with four new feeder stations installed in 2012. A significant proportion of the substation assets are approaching the end of their 30–40-year design life and a focus of FY27 is the feasibility phase of the Substation Renewals Program and early procurement of long lead items. Aurizon Network is also considering options for the OHLE corrosion remediation in the Blackwater System.
Callemondah Yard	Expanded over 30 years but constrained by the Gladstone airport to the south, the Callemondah yard has a tight layout and complicated electrical sectioning and signalling arrangements that increase the impact of faults. Turnouts and signal interlocking renewals continue through FY27, guided by the multi-year Callemondah Yard renewals strategy to minimise access and operational impacts.

Each year, the renewal scope is selected and prioritised for delivery based on the condition of the asset and criticality of the asset location. Appendix 2 – Renewal and Maintenance Strategies by Asset Class provides the process of scope identification including the assessment of condition and criticality for each asset class, the maintenance activities, determinants of asset renewals, typical scope requirements and supply chain risks being managed.

Asset Maintenance Strategy – Blackwater System

Maintenance activity is focused on inspecting and maintaining the in-situ condition of assets, repairing or implementing and maintaining minor holding works (including Temporary Speed Restrictions) following identification of a defect or infrastructure failure to minimise the impact and duration of unplanned outages.

The planned and preventive maintenance activities and inspections, including the planned mechanised production scope, as per the requirements of Aurizon Network's Asset Maintenance and Renewal Policy and associated standards. The inspection regime and frequency are based on asset type, condition and location with defined intervention frequency levels. These can include:

- Usage-based - Example: track resurfacing is required every 50 million gross tonnes.
- Time-based - Example: turnouts requiring weekly visual inspections and a detailed annual inspection.
- Age-based - Example: 22.5 tonne axle load concrete sleepers being replaced every 40 years.

- Fix on failure.

The scope of planned corrective and reactive maintenance tasks is heavily dependent on the faults identified via the planned inspection programs.

Aurizon Network has assumed that in FY27, the Blackwater System will see a similar level of faults that require planned corrective or immediate response as in prior years using the 3-year average and adjusted for known or anticipated risks.

Table 13 summarises the assumptions for the Blackwater System for material maintenance items where the scope assumptions are different to the 3-year average.

Table 13 Asset Maintenance Profile – Blackwater System

Maintenance Item	Comment												
Resurfacing	<p>12% of maintenance budget.</p> <p>Track resurfacing restores the health of the track and ballast assets. It can be both condition or tonnage-based intervention and can be both preventive and corrective.</p> <p>Preventative resurfacing scope is developed using track geometry data captured with ATIS together with historical failures and weather factors.</p>												
Rail Grinding	<p>11% of maintenance budget.</p> <p>Preventative grinding strategy with small amount of corrective allowance to reduce rail breaks and extend the life of rail. Tonnage based intervention translated to time-based frequency to allow long term planning.</p>												
General Track	<p>31% of maintenance budget.</p> <p>Replace rail, turnout maintenance and GIJ and welds represent 27% of General Track Maintenance costs</p> <p>Rail maintenance is expected to be higher than the 3-year average. Inspections and incidents have seen higher number of rail defects and corrective work activity throughout FY25, predominantly replacing rail due to older, life expired fatigued rail. In FY25, the number of rail repairs was 20% higher than the average number of rail repairs from FY23 to FY25, and the number of defects identified by non-destructive testing (ultrasonic) grew by 36% in FY25 compared to the prior three years.</p> <p>Vegetation management supports safety through line of sight and egress to the corridor for train crew, maintenance workers and public at level crossings. Additionally, good vegetation management helps prevent electrical faults related to trees and branches falling on overhead line equipment.</p> <p>The Targeted Drainage Program is a strategic initiative designed to address compromised longitudinal drainage adjacent to track infrastructure. This typically occurs within cuttings and embankments where natural erosion, compounded by wet weather, leads to siltation and blockage of drains. It is a 5-year program in addition to the localised drainage maintenance that focuses on sites of less than 100 metres with identified defects to be repaired in that year.</p> <p>At the completed targeted drainage sites, a steady ongoing drainage maintenance program as part of localised drainage maintenance in the General Track Maintenance category is planned to maintain drainage paths and minimise natural erosion and siltation levels. The following sites are included for FY27.</p> <table border="1"> <thead> <tr> <th>Section</th> <th>Drainage Asset Condition Rating</th> <th>Drainage Asset Condition Definition</th> <th>Nominated Priority</th> </tr> </thead> <tbody> <tr> <td>Archer – Bajool</td> <td>4.0</td> <td>Very Poor</td> <td>Required</td> </tr> <tr> <td>Aldoga – Yarwun</td> <td>3.5</td> <td>Poor to Very Poor</td> <td>Required</td> </tr> </tbody> </table>	Section	Drainage Asset Condition Rating	Drainage Asset Condition Definition	Nominated Priority	Archer – Bajool	4.0	Very Poor	Required	Aldoga – Yarwun	3.5	Poor to Very Poor	Required
Section	Drainage Asset Condition Rating	Drainage Asset Condition Definition	Nominated Priority										
Archer – Bajool	4.0	Very Poor	Required										
Aldoga – Yarwun	3.5	Poor to Very Poor	Required										

Maintenance Item	Comment		
Bluff – Bluff	4.0	Very Poor	Very Highly Recommend
Gregory – Oaky Creek	4.0	Very Poor	Highly Recommend

Note:

Required: Have been assessed as having a very poor condition, compared to all sites in the CQCN have a higher performance impact, higher number of formation failures and a lower \$/t capacity benefit.

Very Highly Recommended: Have been assessed as having at least 3 of the 4 benefits of 'Required'.

Highly Recommended: Poor to very poor condition, with either high history or potential performance impact or high number of formation failures historically.

Recommended: Very poor condition with lower historical or potential performance impacts and lower number of formation failures.

Further information on the drivers of change in General Track maintenance can be referenced in Drivers of Change in Maintenance Budgeting Approach – General Track in Appendix 6 – Works End to End Process.

Signalling and Telecoms

19% of maintenance budget

Signalling and telecoms assets do not wear with tonnage and often show little sign of degradation until failure occurs. These assets typically experience a stable period after installation where failure rates remain low, however, as components age and reach the end of their service life, the likelihood of failure increases rapidly. Maintenance is focused on inspection, servicing and monitoring of the asset. FY25 has seen an increase in control systems incidents by 15% -20% from previous year, driven by points failures and track circuit failures requiring reactive and corrective maintenance.

Performance Trends – Blackwater System

The trend of 4- year averages for cancellations, delays and incidents provide an indication of the performance impact to customers of the asset management strategy over the short and medium term and is one factor in determining asset renewal scope.

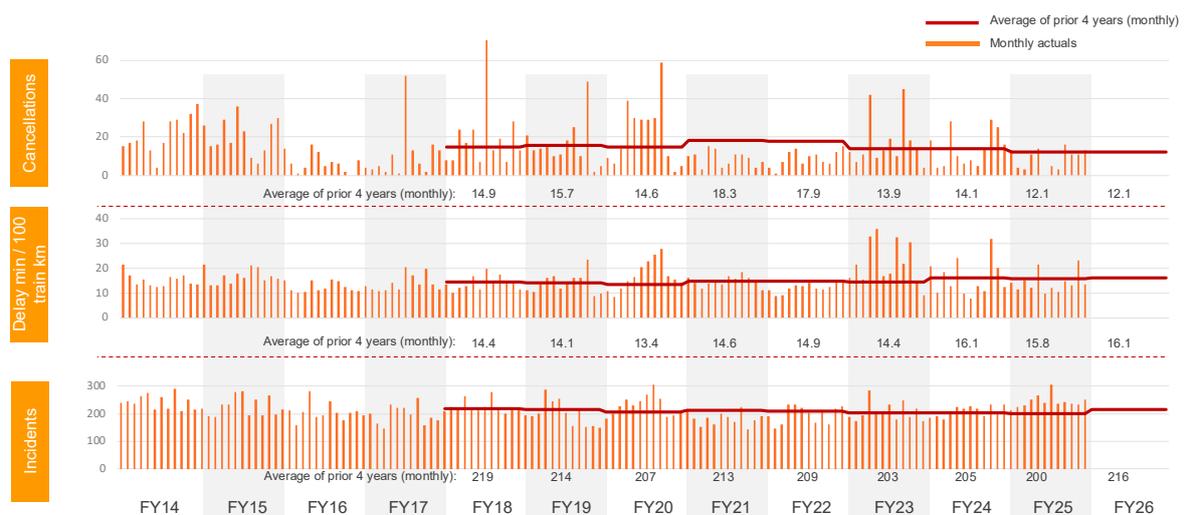


Figure 6 Permanent Way Incidents FY22-FY25 – Blackwater System

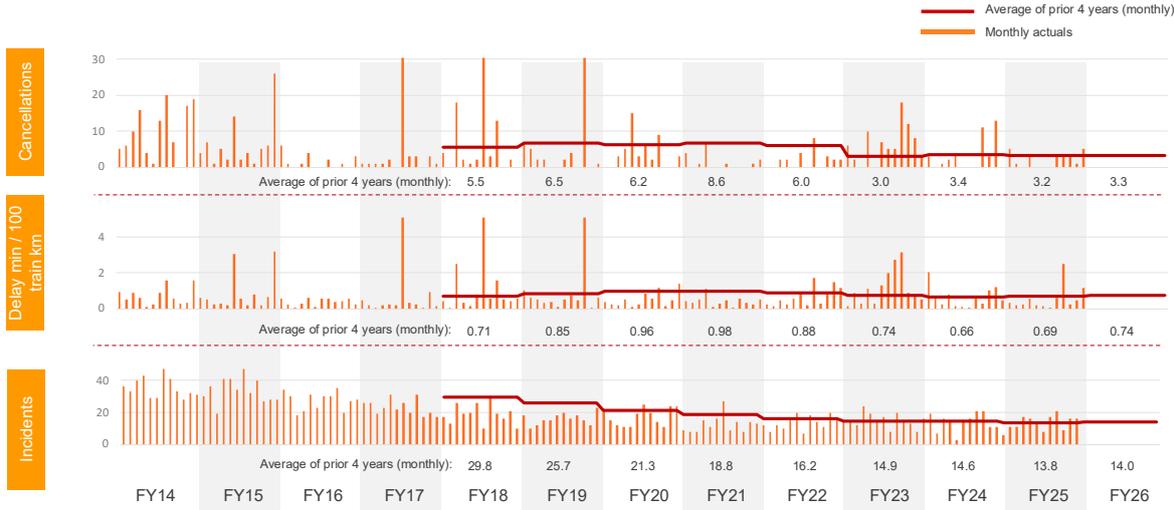


Figure 7 Permanent Way 4-Year Average Trends FY14-FY25 – Blackwater System

Key trends relating to Permanent Way have been identified:

- Permanent Way incident numbers have reduced over the longer-term, and the 4-year average has remained stable from FY23. While overall incident numbers remain constant over recent years, there are some notable trends in Permanent Way incident sub-categories.
- Two trends playing out in FY25 have a bearing on the FY27 maintenance and renewals program. A significant reduction in Broken Rails was observed in FY25, while the number of ultrasonically detected faults have increased, impacted by transverse weld defects associated with older fatigued rail. The ultrasonic program has proven effective in identifying rail defects before rail breaks occur.
- The increased incidence of ultrasonic faults in older fatigued rail has put greater emphasis on the rail renewal program, which is primarily focused on planned rail renewal and track upgrade scope, with a minor reactive renewal component. Blackwater will see rail renewals in FY27 and future years targeting the replacement of fatigued rail.
 - Rail Renewals in FY27 are directed at sections of track to primarily address rail wear and rail fatigue. Rail renewals in Gracemere and Rocklands are focused on alleviating fatigue, while a broader range of Rail renewals sites were selected based on rail wear.
 - Track and rail renewals at Gracemere will improve a section of track that has elevated levels of Permanent Way incidents during FY24 and FY25, including 2 broken rails causing 6 train cancellations. The locations for Rail and track renewals for Blackwater in FY27 are aligned with 28% of Permanent Way incidents occurrence. Notwithstanding that site selection is based on multiple factors, of the sites selected, an elevated level of incident cancellations and delays has been observed.
- Temporary speed restrictions as measured by Delays minutes/100km have been fluctuating between an average of 5.1 in FY24 and 9.0 in FY23. 4-year average is 6.49 min/ 100km. TSRs are cyclical and are usually more prominent with more rainfall.
- Geometry-related Permanent Way and turnout related defects increased in FY25 H2 and FY26 Q1 driving an increase in the number of speed restrictions. FY26 Q1 speed restrictions have been impacting the North Coast Line between Aldoga and Midgee, and Blackwater line between

Figure 8 Electrical Defect Hotspots FY22-FY25 – Blackwater System

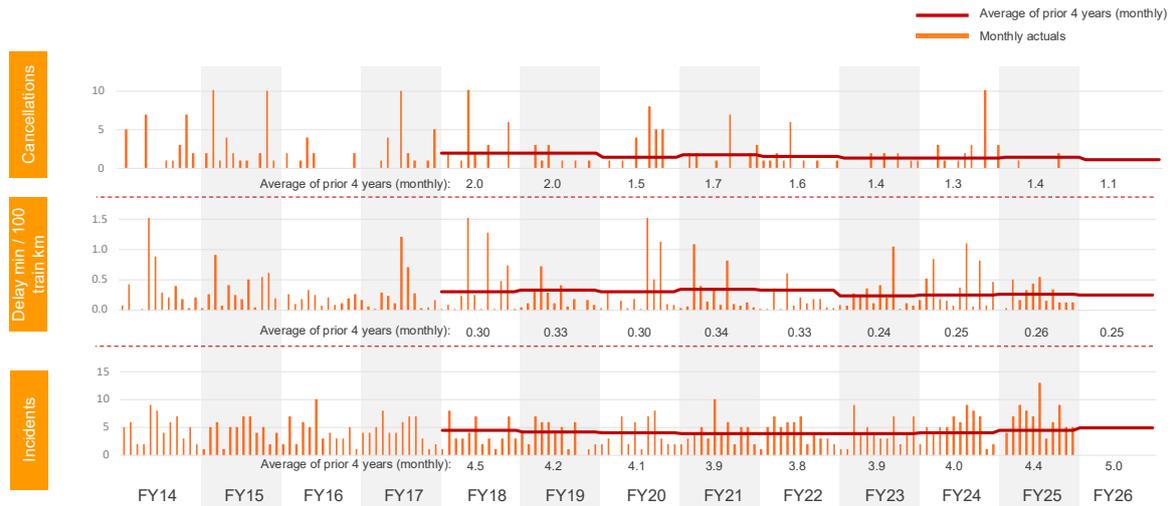


Figure 9 Electrical Incidents 4-Year Average Trends FY22-FY25 – Blackwater System

Key trends relating to electrical incidents have been identified:

- Electrical faults have held fairly steady over time. An increase in incidents in FY25 is primarily driven by an increase in single overcurrent trips, which typically have minor impact to train operations (average 0.5 cancellations per year).
- Dewirements are trending as per 4-year averages in Blackwater, with 5 below-rail dewirements and 20 cancellations over the previous 4-year period.
- Renewals of the Blackwater electrical infrastructure in FY27 are primarily focused on renewal of equipment reaching the end of design life, in order to improve infrastructure resilience.

Control Systems Faults

There is a wide array of control system defect types including Points failures, Track Circuit and Signal failures. Figure 10 and Figure 11 show incident hotspots in the Blackwater System and the 4-year average trend for cancellations, delays and incidents. Incidents tend to concentrate at areas with high level of asset density. Callemondah, Mt Miller and Marmor are top three stations in terms of incident count over FY22-FY25.



Figure 10 Control Systems Incidents Hotspots FY22-FY25 – Blackwater System

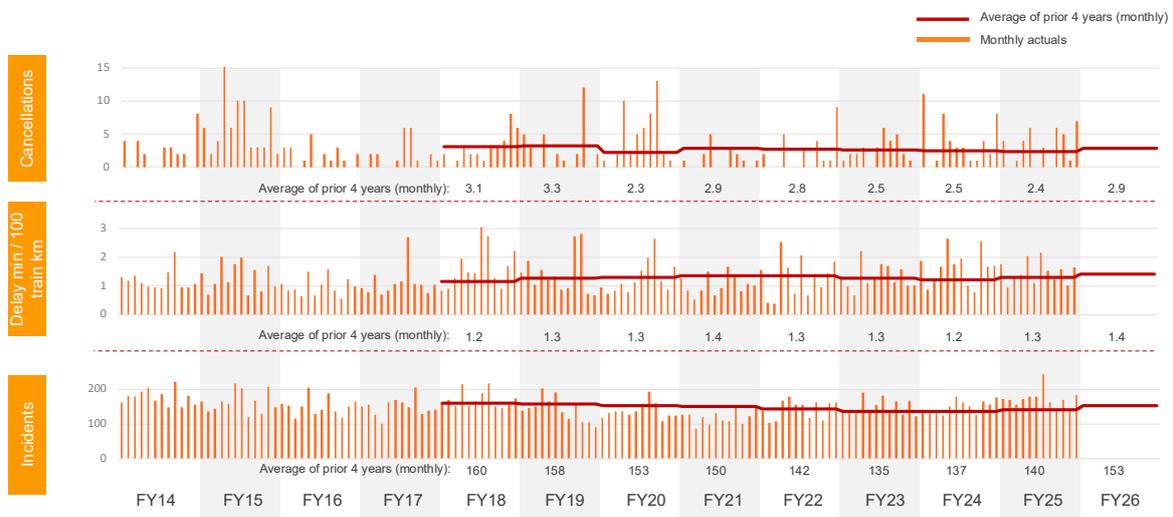


Figure 11 Control Systems Incidents 4-Year Average Trends – Blackwater System

Key trends relating to Control Systems have been identified:

- 4-year averages have reduced over time, however there was an increase in incidents in FY25 compared to previous years. Incident delays and cancellations have also been on the rise, peaking in FY24. The increase in incidents in FY25 is driven primarily by Points failures, Track Circuit failures and Telemetry failures.
 - The interactive nature of Points machines and turnouts means that a turnout in poor condition can impact the operations of the Points machines. Turnout renewals and

preventative maintenance program in FY27 aim to manage the reliability associated with points failures.

- A large portion of Track Circuits in the Blackwater system are coming to the end of serviceable life. The renewal program will replace obsolete CSEE track circuits with more reliable Axle counters, at Warren in FY27 with further renewals planned for subsequent years.
- Telemetry failures are typically related to malfunction of power supply equipment. Renewals of this type of equipment is based on obsolescence.

3.2 Renewals Budget – Blackwater System

Aurizon Network's FY27 Final Draft Proposal for the Blackwater system provides for Asset Renewals of \$153.6m. The FY27 renewal program is proposing to renew between 0.2% and 7.3% of system assets by asset category. The average condition of Blackwater system assets included in the renewals budget (excluding reactive and strategic renewals) is 4.12 (very poor).

The FY27 Final Draft Proposal is \$8.2m higher than the indicative forecast for FY27 included in the FY26 MRSB and \$25.9m higher than the approved FY26 Budget Renewals Strategy and Budget.

This section provides a comparison of the scope selected for FY27 against the FY26 Budget and the indicative forecast for FY27 included in the FY26 MRSB. Variation in costs is as compared to the FY26 Budget.

FY27 Renewal Scope Selected – Blackwater System

Figure 12 shows the distribution of scope locations as well as the relative spend per scope. As is typical of prior years in the Blackwater system, the works completed are most concentrated on the NCL and Central mainlines aligned to these track sections seeing 100% of system traffic. There is also investment on branch lines and individual mine balloon loops.

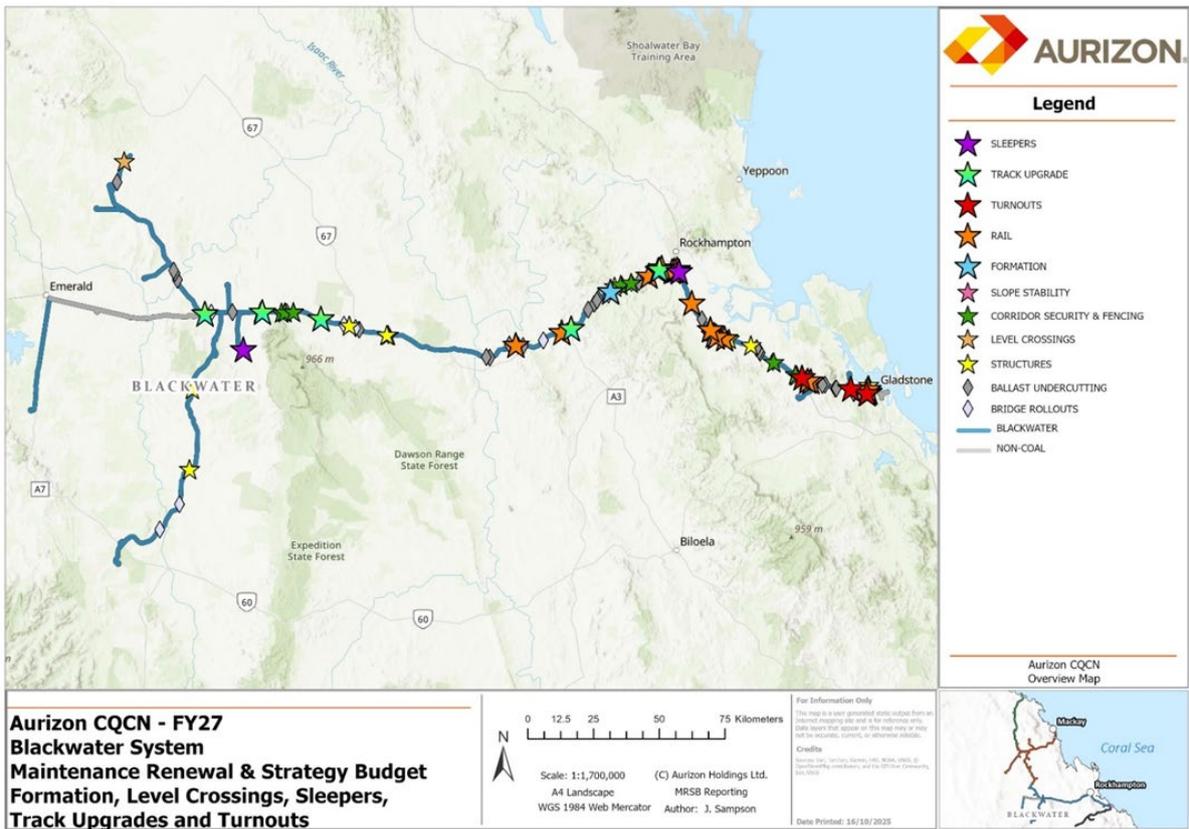


Figure 12 FY27 Civil Asset Renewal Locations – Blackwater System

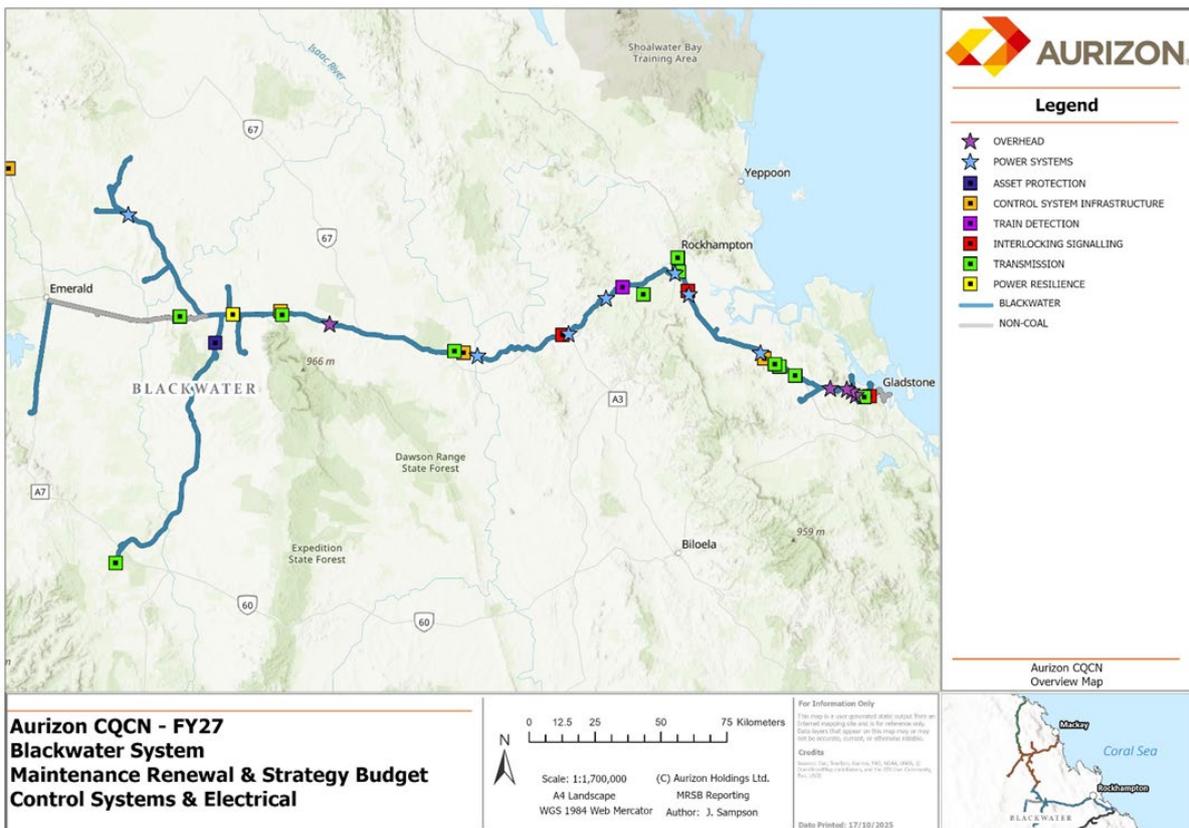


Figure 13 FY27 Control Systems and Electrical Renewal Locations – Blackwater System

The selection of scope each year is a product of multiple factors, depending on the asset class, that contributed to the assessment of condition and criticality. Information is provided in Performance Trends – Blackwater System on those elements of the renewal program that are correlated with System performance trends. The commentary below informs the scope selection for:

- driving scope for integrated closures or for a large proportion of single line possessions to support the impact on available capacity
- scope which has a complex delivery or the mix of scope items results in a material change in costs compared to FY26
- scope which is material for the asset class and is also a substantial part of the budget in total.

Rail/ Sleepers/ Track Upgrade

This year, all Sleeper Renewals will be delivered as part of Track Upgrades noting that for transparency, sleeper renewals remain as a separate renewal item for the FY27 proposed scope in Table 14.

The 7.7 rail km between Gracemere and Kabra turnouts are equivalent to 25% of the total rail scope and is driving scope for the May 100 hour closure. This scope has a future asset condition of 3.5 (poor to very poor). It has seen multiple defects through the curves and has reached its fatigue limits.

The Parnabal to Walton Track Upgrade represents a third of the total track km for Track Upgrades. It is driving scope in the April 84 hour closure. It has a future condition rating of 3.8 (poor to very poor), has reached its fatigue limits and has defects showing.

The 1.5km Track upgrade at Westwood to Windah is driving scope for the April 84 hr closure. The future condition is 3.7 (poor to very poor) due to fatigued rail, the 60kg standard carbon rail having reached its design limits and with fatigue related defects showing. The sleeper renewal is replacing fist clip sleepers with pandrol e-clip sleepers.

The 1.9km Track Upgrade Gracemere to Kabra is driving scope in the October 84 hour closure. It is future condition rated 3.4 (poor to very poor) having reached fatigue limits.

Track upgrade Burngrove – Crew, while a smaller site at 0.35km, is driving scope for the November 60 hour closure and has a future condition score of 3.8 (poor to very poor)

Turnout Renewals

The FY27 Turnout renewal program comprises three turnouts at Callemondah, Mount Miller & Mt Larcom. These turnouts are life expired and will be replaced with modern day equivalent to standardise and ensure safe operations.

The Turnout Renewal at Mt Larcom is driving scope for the October 84 hour closure. This is a full turnout renewal that is upgrading the crossing and has a future condition rating of 3.5 (poor to very poor).

The Turnout Renewal at Callemondah is a full turnout renewal that is upgrading rail from 47 kg/ m to 60 kgm and the points mechanism from mechanical to motorised. The future condition rating is 4.5 (very poor to failed).

Ballast Cleaning

Mainline Ballast Cleaning is driving scope for either Integrated Closures or planned single line possessions with c.90% of the 46.6km of planned scope to be delivered by the ballast cleaning machine (RM902).

The North Coast Line will see approximately 35% of the total scope, with the Aldoga to Mt Larcom scope the largest scope item at 8.4km. It has a future condition of 4.5 (very poor to failed) and is moderate to highly fouled. Track Geometry is moderately rough and the location has seen cancellations, TSR's and associated delays because of track alignment and ballast condition.

Grantleigh to Edungalba is driving scope for the March 36 hour closure. This is 2 sites at 3.5km in total with an average future condition rating of 4.4 (very poor to failed) and Percentage Void Contamination (PVC) of 40% and 59%, above the 38% intervention threshold.

Bluff to Boonal is driving scope for the January 36 hour closure and has a future condition rating of 3.3 (poor) and PVC of 58%.

Blackwater to Rangal is driving scope for the April 84 hour closure, has a future condition rating of 3.1 (poor) and PVC of 59%.

The remainder scope on the Central Line and Gregory Branch averages 2.2km per scope item with all future condition ratings 3 (poor) or above. Two scope items at Warren to Wycarbah and Edungalba to Aroona have condition ratings of 4 or above (very poor to failed).

11 Bridge Rollouts are planned in FY27 with future condition ratings of between 2.9 and 3.9, averaging 3.5 (poor to very poor) per site and an average scope quantity per site of 69m.

21 Turnout Undercutting renewals are planned, including 4 reactive renewals. The planned renewals have future condition ratings of between 3.9 and 4.6 (Very poor to failed) reflecting the highly to severely fouled state.

Culvert Renewal

The Culvert Renewal program includes renewals across 15 sites in Blackwater, including an allocation for one reactive renewal site. The 14 renewals planned for FY27 include 12 Reinforced Concrete Box Culvert renewals, 1 Reinforced Concrete Pipe renewal and 1 Cured In Place Pipe lining. All sites have a condition rating of 3.5 (Poor to very poor) to 4.5 (very poor to failed).

- The renewal at Mt Larcom is driving scope in the August 60 hour closure. This will involve the removal and replacement of the existing reinforced concrete pipe with a reinforced concrete box culvert. The asset is future condition rated 4.5 (very poor to failed) and is seeing significant cracking in the top half of the reinforced concrete pipe and reduced waterway capacity giving rise to increased risk of track washout.
- The Bajool culvert is future condition rated 4 (very poor) and driving scope in the October 84 hour closure. The renewal will involve the removal and replacement of the existing reinforced concrete box that is currently seeing pumping which means it is under capacity, the base slab has normally failed, and units are starting to fail or deteriorate more quickly. If left it will collapse, impact drainage, increase the risk of washout and lead to top of line issues in track.
- The Memooloo Culvert Renewal is driving scope for both the January and March 36 hour closures. It is a 21-cell corrugated metal pipe with corrosion in all inverters (upside down arch providing side to side support). The concrete lining will extend the life of the asset that is future condition rated 4 (very poor).
- The removal and replacement of the reinforced concrete box culvert at Boonal in the March 36 hour closure is to address pumping and severe cracks throughout ceiling and legs, increasing the risk of collapse and pumping that will make the structure deteriorate faster. Original culverts were intended for 15 TAL compared to the current operation of 26.5 TAL, further increasing the risk of collapse. The asset is future condition rated as 4.5 (very poor to failed).

- The removal and replacement of the reinforced concrete box culvert at Warren is to address a future condition rating of 4 (very poor) due to pumping and severe cracking. It is driving scope for the April 84 hour closure.
- The Clinton reinforced concrete box culvert renewal in the May 100 hour closure has severe cracking that has been grouted as an interim measure to hold until renewal. It has significantly reduced hydraulic capacity resulting in a high risk of track washout.

Slope Stability Renewal

The proposed slope stability renewal at the cutting in Rocklands is future asset condition rated at 5 (failed) as the rock face has failed. The scope in FY27 is a continuation of FY26 scope. It is driving scope for the March 36-hour closure.

Level Crossing Renewal

The FY27 Level Crossing Renewal program will see two planned renewals at Gregory Junction & Mt Larcom, with Gregory Junction site being driving scope for the November 60 hour closure. The renewal at Gregory Junction will be in conjunction with 2 culvert renewals and has a future condition of 3.5 (poor to very poor).

Formation Renewal

The FY27 Formation program will see 3 major renewals at Bajool, Marmor and Warren. Formation Renewal scope includes an allocation for 0.74kms of reactive works.

At Bajool there is 0.36km of formation renewal which will require removal and reinstatement of Bajool Turnouts 7C/D. The future condition score is 5 (failed).

At Marmor there is 0.44km of formation renewal. The future condition score is 4 (very poor). This is driving scope for the August 60 hour closure.

The 0.4km of formation renewal at Warren is required to remediate known weak formation. This forms part of the ongoing multiyear scope to address known weak formation across the Kalapa flats. This section has a history of several reactive formation failures with associated TSRs and adjacent locations have previously been closed to loaded traffic prior to renewals in FY24 and FY25. The future condition score is 4.7 (very poor to failed).

Control Systems Renewal

Safety Working:

- Renewals of the Blackwater Mainline Weighbridge at Boorgoon and the Wheel Impact Load Detector at Kalapa, which have both had designs completed in prior years and both have future condition ratings of 4 (very poor).
- Interlocking renewals at Callemondah are driving scope across August, October and May closures. Interlockings control field equipment in Remote Controlled Signalling (RCS) areas and enforce the safe separation of trains. The Callemondah interlockings are future condition rated 5, at end of life. The renewal will replace existing assets with modern day equivalents that will facilitate operational modifications and significantly reduce interruptions to services. Replacement of Callemondah interlocking commenced in 2020 and is due for completion in 2028. Stage 1 replaced the cabling with digital connections. This next stage will see the installation and commissioning of data (operational logic) in distributed signalling equipment rooms (that is splitting the yard from the mainline to provide flexibility). This stage will see two thirds of the yard completed. The testing of the interlocking from Callemondah to the control

room requires the equivalent of a week of closures. Splitting across three closures reduces the impact to customers.

- Renewal of the Relay Interlocking to Processor Based Interlocking at Midgee, with the future condition rating of 4 (very poor).
- Replacement of the CSEE track circuits that are obsolete proprietary analogue technology, condition rated 4.5 (very poor to failed), with modern equivalent axle counters at Warren.

Transmission and Data Renewals:

- Signalling equipment room at Callemondah with a future condition rating of 5 (failed).
- 44 Industrial Ethernet 3010 series switches that are no longer supported by Cisco (future condition rated 5 – failed) and allow the routing around single points of failure of underlying transmission infrastructure to maintain operations.
- The renewal of three Digital Microwave Radio links at Crocker Peak, Gogango and Table Mountain, with a future condition rating of 5 (failed) due to obsolescence, that provide redundancy for optical fibre-based transmission or may be the sole communications pathway to some sites.

Electrical Renewals

Feeder Wire Clearance Improvements include one major renewal to be completed at Bluff in FY27 to address reliability issues due to inadequate clearance between the high voltage wires and the structures they are mounted on which allows wildlife to breach the gap contributing to ‘trips’ of the OHLE.

Small Components - The asset comprises of many small part steelwork components which have a shorter service life compared to the overhead line structures and conductors. These components are renewed through the small component program with modern equivalent components. Five locations will be renewed in FY27 including an allocation for one reactive renewal. The FY27 sites at Aldoga, Aldoga to Mt Larcom, Mt Miller and Mt Miller to Yarwun are future condition rated 5 (failed).

Power Systems includes the renewal of 3 Auto Transformers at Rocklands in line with the strategy to smooth investment to mitigate a bow wave of renewals due to the number of assets with similar age and condition. Additionally, the FY27 program includes the completion of the feasibility stage of the Traction Substation Renewals project and the procurement of long lead items.

Table 14 provides a summary of Blackwater System renewals as a proportion of total system assets, as well as the condition and criticality of the sites selected.

Table 14 FY27 Renewals Strategy - Blackwater System

Renewal Item	FY27 Proposed Scope	FY27 No. of Sites	Avg Future Condition of Sites Selected	Avg Criticality of Sites Selected	Total System Assets	FY27 Scope % Total System Assets	Cost (\$m)
Civil Assets							122.7
Permanent Way							32.6
Rail Renewal (rail Km)	26.5	10	3.6	3.5	2,352	1.4	11.2
Sleeper Renewal (sleepers)	139	1	3.8	2.5	1,612,574	<0.01	0.6

Renewal Item	FY27 Proposed Scope	FY27 No. of Sites	Avg Future Condition of Sites Selected	Avg Criticality of Sites Selected	Total System Assets	FY27 Scope % Total System Assets	Cost (\$m)
Track Upgrade (Track km)	6.9	4	3.8	2.7	1,176	0.5	9.1
Permanent Way – Other			5.0				1.5
Turnout Renewals	3	3	3.8	4.0	431	0.7	6.2
Turnout Components			5.0				3.8
Turnouts Designs	4	1	4.1	4.4			0.3
Ballast Cleaning							54.0
Mainline Undercutting (track km)	53.6	15	3.6	3.5	1,176	4.6	36.3
Mainline Excavator Undercutting (track km)	3.5	2	3.8	4.7			2.6
Turnout Undercutting (site)	21	8	4.3	3.9	431	4.9	4.8
Bridge Rollout (m)	760	10	3.6	3.8	150	7.3	7.9
Monumenting (site)			5.0				1.4
Ground Penetrating Radar			5.0				0.9
Structures							15.0
Bridges Design (site)	1	1	3.0	3.8			0.1
Bridges (Component) Renewal (site)	1	1	3.8	4.2	150	1.3	1.2
Culvert Design (site)	22	11	4.2	4.1			0.9
Culvert Renewals (site)	14	12	4.2	3.9	1,473	1.0	12.9
Civil Renewals							21.0
Level Crossing Renewals (site)	2	2	3.6	3.5	236	0.8	2.3
Level Crossing Design (site)	4	3	4.8	5.0			0.2
Level Crossing Other			5.0				0.4
Formation Renewals (track km)	1.2	3	4.6	4.3	1,176	1.3	5.9
Formation Reactive			5.0				3.5
Slope Stability	1	1	5.0	4.0			4.5
Formation Other			5.0	5.0			0.1
Access Points (site)	4	3	5.0	5.0			1.3
Access Roads (site)			5.0				0.4
Corridor Security Fencing (km)	30.0	6	4.4	3.8	1,569	1.9	2.3

Renewal Item	FY27 Proposed Scope	FY27 No. of Sites	Avg Future Condition of Sites Selected	Avg Criticality of Sites Selected	Total System Assets	FY27 Scope % Total System Assets	Cost (\$m)
Control Systems Assets							23.0
Safe Working Systems – Asset Protection (site/unit)	4	3	4.0	4.8			2.4
Safe Working Systems – Interlockings (site/unit)	2	2	4.0	4.0			6.5
Safe Working Systems – Train Detection (site/unit)	79	2	4.3	4.0			3.8
Safe Working Systems – Minor (site/unit)	18	5	4.7	4.0			0.6
Power Resilience	2	2	4.0	4.0			0.3
Telecommunication Asset	12.6	5	4.0	4.0			0.1
Transmission & Data Renewals (site/unit)	79	74	4.6	4.0			7.2
UTC DTC (site/unit)	3	3	4.0	4.0			1.4
Other Control Systems Renewals			4.0				0.2
Cyber Security	-		5.0				0.6
Electrical Assets							7.9
Overhead Line Equipment Renewal (site/unit)	5	4	4.9	4.9			1.9
Power Systems Renewal (site/unit)	16	7	3.7	3.1			3.4
Traction Substation Renewal (site/unit)	-	-	5.0	5.0			2.6
Total							153.6

Note: Figures may not add due to rounding.

FY27 Renewal Scope Variance Analysis – Blackwater System

Broadly, the variation in scope for each asset class compared to either the FY26 Budget or the indicative forecast for FY27 included the FY26 MRSB is due to the review of asset condition and criticality as part of selecting scope for the FY27 Final Draft Proposal.

Compared to FY27 Indicative Forecast included in FY26 MRSB (increase of \$8.2m):

Civil (\$1.0m or c.12% of increase) – Reductions in rail renewal and track upgrade delivery costs as well as formation and culvert renewal scope are offset by inclusion of slope stability scope (omitted from the forecast), reactive renewals for GIJs and rail lubrication and increases in turnout renewal costs. Mainline undercutting cost reductions were offset by Bridge Roll out cost increases.

Control Systems (\$6.2m or c.72% of increase) – Increase is reflective of increases in estimates across several products based on the maturing of design, partly offset by forecast reduction in design activity.

Electrical Systems (\$1.0m or c.11% of increase) – Increase is due to maturing of estimates and scope for the Electric Traction Substation renewals program.

Compared to FY26 Budget (increase of \$25.9m):

Civil (\$16.9m or c.65% of increase) – Two thirds of the increase is attributable to scope to address asset condition. Major changes are for:

- rail renewals to address fatigue rail
- turnout renewal to address assets at end of life
- mainline and turnout undercutting relating to highly fouled assets
- reactive formation, which is reflective of increased formation failures
- additional culvert renewals to address severe cracking and/ or corrosion.

Control Systems (\$8.2m or c.31% of increase) – Approximately 60% of the increase is related to scope increases and is reflective of the reduction in FY26 scope to provide stability in the delivery of the program year on year.

Electrical (\$0.7m or c.3% of increase) – Increase is directly attributable to the maturing of the Traction Substation Renewals program and increases in costs associated with Autotransformer Renewals.

Set out in Table 15 is a summary of FY27 Blackwater System renewals compared to the FY26 Budget, at the program level.

Table 15 FY27 Renewals Budget - Blackwater System

Renewal Item	Assets Included	FY26 Approved Budget (\$m)	FY27 Proposed Budget (\$m)	FY26B v FY27B (\$m)
Civil Assets		105.8	122.7	17.0
Permanent Way	Rail, Track Upgrade, Sleepers, Turnouts	23.2	32.6	9.4
Ballast Cleaning	Mainline and Turnout Undercutting, Bridge Ballast, Monumenting and GPR	51.8	54.0	2.2
Structures	Bridges and Culverts	13.2	15.0	1.8
Civil Renewals	Level Crossings, Formation, Access Points, Slope Stability	17.6	21.0	3.5
Control Systems	Safe Working, Train Control and Detection, Interlocking, Telecoms, Power Resilience, Transmission	14.8	23.0	8.2
Electrical Assets	Overhead Line Equipment and Power Systems	7.1	7.9	0.7
Total		127.7	154.0	26.3

Note: Figures may not add due to rounding.

Table 16 provides detail on the variance between the FY27 Final Draft Budget and the FY26 Budget.

Table 16 Cost Driver Movement Summary – Blackwater System

RIG Category	FY26B v FY27B	Comment
Civil Assets	\$17.0m	
Permanent Way	\$9.4m	<p>Rail - In FY27, the scope for rerail has increased to 31.8km, up from 15.9km in FY26. This sees a \$5.4m increase to the program in FY27. On a unit rate basis, the cost per km of rail installed has reduced in the FY27 proposed budget due to efficiency via larger sites in the FY27 program</p> <p>Track Upgrade – In FY26, one large 4.5km track upgrade will be completed, requiring a single site setup. In contrast FY27 includes four smaller sites averaging 1.8km each, which increases planning and establishment costs. As a result, the unit rate for FY27 is higher than FY26.</p> <p>Turnout Renewal – In FY26, two turnouts were delivered at a single location, allowing for shared planning and site costs. In FY27, three individual turnouts are planned across separate sites, each requiring standalone planning and establishment. This results in a higher unit rate per turnout in FY27.</p>
Ballast	\$2.2m	<p>Mainline Undercutting – similar program cost and scope in FY27 to FY26 with a 7% reduction in cost per km of undercutting. Achieved via planned FY27 sites being on average longer than FY26 sites and improved assumed return rates.</p> <p>Turnout Undercutting –FY27 sees 21 turnouts for undercutting, up from 17 in FY26. FY27 unit rate is 12% lower per turnout as 15 of the 21 will be completed in a nest, where a series of adjacent turnouts are undercut in the same track possession rather than individually. This increase utilisation of plant and reduces site specific costs.</p> <p>Bridge Ballast – In FY27 there are 11 sites with the average site length being 70m. In FY26 there were 4 large sites (including Mckenzie Reiver Bridge at 500m) with an average of 193m. Large sites are more efficient cost wise. The size of a site is dictated by the size of the bridge being treated. FY27 sees a larger mix of small bridges requiring work.</p>
Structures	\$1.8m	<p>Bridges & Culverts – FY27 Final Draft Budget is higher with slightly fewer sites. The variation in program cost relates to the differing mix of renewal types between years. In FY27, 12 of 14 sites are full remove and replace of culverts,with 2 culvert linings (1 being a large scope item at Memooloo). In FY26, 3 sites were elimination that sees existing structures simply filled as such the cost per site at these are well below costs of remove and replace.</p> <p>Culvert Estimate Assumptions – Year to year variation in the structures spend is driven by the mix of works. Network achieved program savings in FY25 and FY26 through procurement, where initial MRSB estimates proved conservative compared to vendor pricing. Consequently, the FY27 estimate reflects a better tender cost outcome than in prior years as this market tender saving is expected to exceed the FY26 tendered pricing.</p>
Civil Renewals	\$3.5m	<p>Formation Reactive – An additional \$1.2m has been allocated for reactive formation scope in FY27. This increase reflects the year-on-year increase of reactive formation sites in FY24 And FY25. Given its location below the track structure formation presents as a defect requiring reactive renewals to retain track capacity and operational safety.</p>
Control Systems	\$8.2m	<p>The FY26 program was reduced to stabilise the delivery of the program and to create space for the completion of design works to be delivered in future years. The program is larger in FY27.</p> <p>For renewals, design, procure and build variance, \$6m is due to scope increases and \$2m is due to cost changes, including:</p> <ul style="list-style-type: none"> • reductions in tetra radio cost

RIG Category	FY26B v FY27B	Comment
		<ul style="list-style-type: none"> increases in interlocking (Callemondah) - different work completed in FY26 V's FY27 (cabling v data) increase in relay to PBI renewal increase in digital telemetry. <p>Reduction in design, design and order, design and procure activity in FY27. No relay to PBI Interlocking design and order in FY27.</p>
Electrical Assets	\$0.7m	<p>OHLE Renewals - \$1.1m less in FY27 to FY26, No Termination Portals being renewed in FY27 v's 9 in FY26. Focus in FY27 is more on small component Renewals</p> <p>Feeder Station Renewals – Elevated costs in FY27 as project will be completing Feasibility planning and early procurement activities ahead of the delivery commencing in FY28</p> <p>Autotransformers – Increase in supply cost of AT units and requirement for additional isolator works at FY27 sites.</p>

Renewals Opportunities and Risks – Blackwater System

Aurizon Network has identified risks and opportunities across each renewals category in the Blackwater system. It has then quantified the possible value impact of these risk or opportunities eventuating in the FY27 MRSB period and assigned an associated value range to the budget that should be considered as the opening forecast for the delivery of the identified scope.

On a weighted average of estimate class and program value, the FY27 renewals budget should be considered as a Class 3 estimate.

The upper and lower bounds of this value range represent the extremes of all risks, or all opportunities realising in the MRSB period.

Table 17 Opportunity and Risk Range – Blackwater System

	\$m
FY27 Renewals Budget	\$153.6
Class of Estimate at Submission	Class 3: +/-10%
Resulting Value Range	+15.4 / -\$15.4
FY27 Upper and Lower Value Range	Upper \$168.7 / Lower \$138.24

Figure 14 indicates each program of works plotted to represent the value of the program in FY27 and the class of estimate representing the value range at the point of MRSB submission.

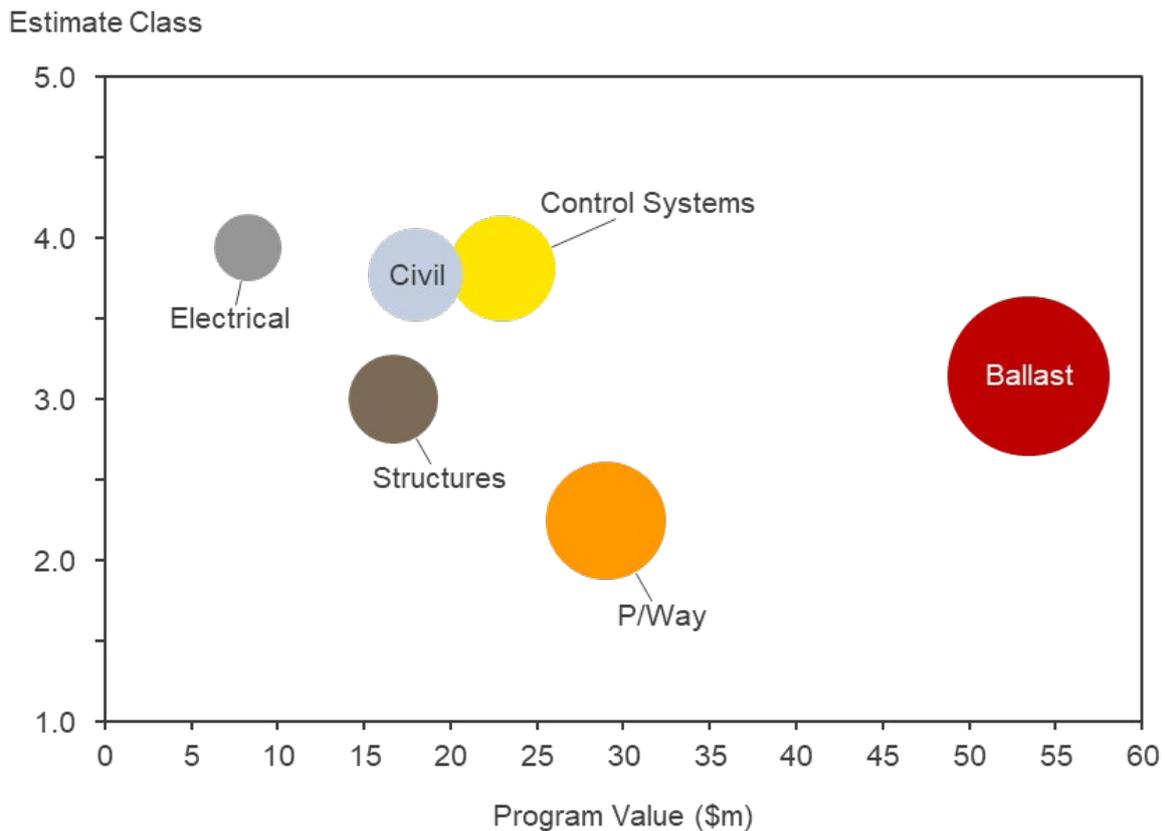


Figure 14 Program Value and Estimate Class – Blackwater System

Those programs that are typical Baseload scope attract a lower class of estimate that reflects the reduced level of expected delivery uncertainty. Those scope items that are strategic in nature or at early stages of delivery planning, procurement or design at submission time attract a higher value range of estimate. Of note in FY27:

- The Feeder Station Renewals program within the Electrical program is at a Feasibility project stage in FY27 with design of the final delivery program to be determined.
- The Control Systems program is considered at Class 4. Given the heavy dependence on external vendors and that Aurizon competes in a global market for electrical components. The procurement elements of this program have a significant impact on the actual versus forecast project cost. Aurizon develop its estimate given either last known costs from prior years or estimated costs based on early vendor engagement. The procurement process for the program will be completed ahead of the FY27 period, the outcome of these processes will result in the estimate being better defined prior to FY27 delivery.
- The Slope Stability project (within the Civil Program) is currently at a Class 5 estimate as Aurizon continues the procurement of this specialised contractor. Once the sourcing and procurement process is finalised (expected March 26), the estimate will be refined prior to FY27 delivery.
- The Ballast program is at class 3. Actual return rate of ballast versus assumptions in estimate will be the main driver of variation (both negative or positive in the year of delivery).
- The delivery approach for the Track Upgrade scopes at Westwood-Windah, Rocklands-Gracemere and Parnabal-Walton is still in development due to the complexity of accessing these sites within an embankment/cutting.

3.3 Maintenance Budget – Blackwater System

Aurizon Network has developed its Final Draft Maintenance Strategy and Budget for the Blackwater System having regard to all relevant matters outlined in clause 7A.11 of UT5, including the Maintenance Objectives. Aurizon Network considers its FY27 Final Draft Proposal provides an appropriate level of asset activity that will promote the safety, reliability and performance of the Blackwater System rail Infrastructure and seeking to deliver Committed Capacity.

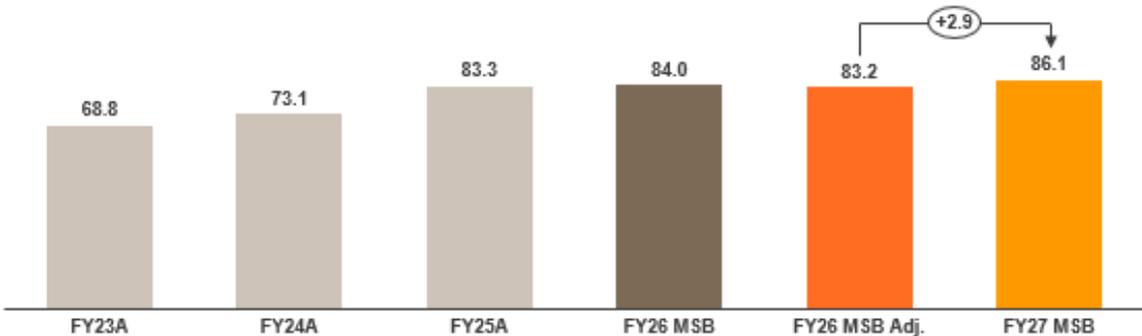
Summary of Historic, Forecast and FY27 Maintenance Strategy and Budget – Blackwater System

Aurizon Network’s FY27 Final Draft Proposal for the Blackwater System provides for a Direct Maintenance Cost Allowance of \$86.1m (excluding ballast undercutting plant depreciation) and assumes delivery of efficiencies identified in section 2.4 Improvements and Efficiencies. The budget is largely informed by escalation, fixed internal labour and indirect costs and historical activity levels, with General Track, Signalling & Telecoms and Resurfacing activities representing ~63% of the system spend.

To maintain asset condition and reliability, a higher level of corrective maintenance activity is expected in the General Track Maintenance and Signalling & Telecoms Maintenance programs. The FY27 Final Draft Budget is \$2.1m higher than the FY26 Budget or \$2.9m higher when the FY26 Budget is adjusted to remove certain Mine Specific Infrastructure costs.¹

Figure 15 and Figure 16 provide a summary of historic direct maintenance costs as well as the proposed direct maintenance cost allowance in respect of FY27.

To ensure comparability with prior periods, the direct maintenance costs shown in these figures exclude depreciation on ballast plant. The figures below also include an adjusted FY26 Budget value to reflect the removal of the Mine Specific Infrastructure costs noted above.



¹ On 29 April 2025, Aurizon Network submitted updates to the FY2026 Annual Review of Reference Tariffs, including an amendment to the Maintenance Indicator to remove forecast expenditure associated with Mine Specific Infrastructure, which was included in the approved budget for FY26.

Figure 15 Historic Direct Maintenance Costs – Blackwater System

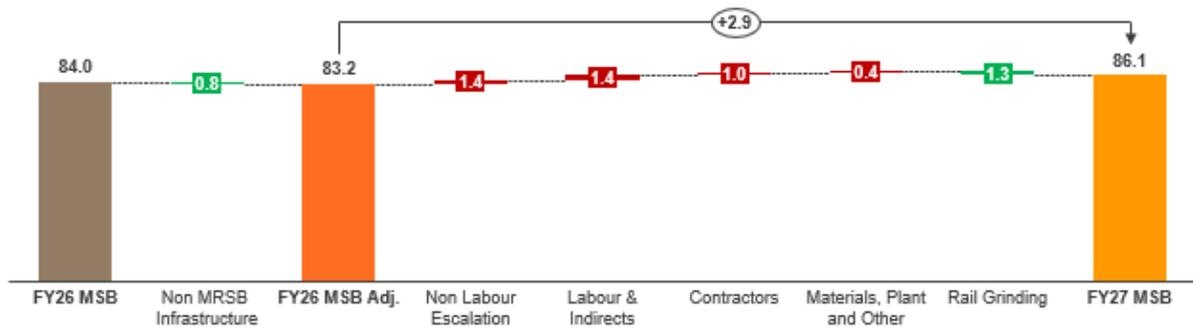


Figure 16 Cost Driver Movement Breakdown – Blackwater System

Table 18 describes the movement in maintenance spend against the prior approved budget, by cost category.

Table 18 Cost Driver Movement Summary – Blackwater System

Cost Category	Change	Comment
Non-MRSB Infrastructure	(\$0.8m)	On 29 April 2025, Aurizon Network submitted updates to the FY2026 Annual Review of Reference Tariffs, including an amendment to the Maintenance Indicator to remove forecast expenditure associated with Mine Specific Infrastructure. The MSB has been adjusted to reflect the removal of these costs.
Non-Labour Escalation	\$1.4m	Increase driven by annual cost escalation on contractors, materials, plant, other consumables and rail grinding.
Labour and Indirect Costs	\$1.4m	Labour and indirect cost included in the FY27 Final Draft Budget reflect the execution of the labour efficiency initiatives across all teams during FY26, to deliver on the target efficiencies overlayed in the FY26 Budget. Labour and Indirect costs increase against FY26 Budget is driven by: <ul style="list-style-type: none"> Uplift in higher maintenance activity for Signalling & Telecoms Labour, in addition to changes driven by system mix variation.. Higher Track Resurfacing labour costs \$0.6m reflecting increased allocation of resurfacing labour due to lower plant maintenance activities. Offset by: <ul style="list-style-type: none"> Reduction in Electrical Overhead labour (\$0.2m) due to variation in maintenance activity mix across other categories and systems. Reduction in Civil Infrastructure labour (\$0.6m) driven by reprioritisation of Gladstone civil district resources to support increased maintenance levels in Moura, slightly offset by increases from other Civil resources to support rail maintenance activity levels. Movements isolated above include annual increases required under the Infrastructure Enterprise Agreement and other Staff Agreements.
Contractors	\$1.0m	Contractor cost increase against the FY26 Budget is driven by: <ul style="list-style-type: none"> General Track maintenance \$0.6m following the inclusion of the drainage program \$1.1m and support to deliver rail maintenance activity levels \$0.3m. This has been offset by a reduction in external vegetation management costs driven by the internalisation of a range of activities. An increase in Electrical Overhead contractor costs due to additional feeder station maintenance required in FY27. Offset by a reduction in Other Civil Maintenance support requirements.

Cost Category	Change	Comment
Material and Plant Usage	\$0.4m	<p>Material and Plant Usage increase against FY26 Budget is driven by:</p> <ul style="list-style-type: none"> • Signalling & Telecoms increase \$0.5m, driven by an uplift in maintenance activity levels within Blackwater system. • General Track maintenance increased by \$0.4m predominately driven by rail materials \$0.3m required to support corrective rail maintenance defects activity levels and an increase in internal plant costs \$0.1m to support ballast maintenance requirements. <p>Offset by:</p> <ul style="list-style-type: none"> • Other Civil Maintenance (\$0.2m) which reflects an assumed reduction in corrective maintenance activity levels. • Lower Track Resurfacing materials and plant usage (\$0.5m) which reflects reduced maintenance consumables, along with a lower allocation of resurfacing team labour due to reduced plant maintenance activities.
Rail Grinding	(\$1.3m)	Reduction in Mainline scope due to cycle variations, turnout frequency, and additional grinding activities completed in FY26 that are not required in FY27.
Total	\$2.1m	

Note: Figures may not add due to rounding.

The proposed FY27 maintenance scope and budget for the Blackwater System is outlined in Table 19.

Table 19 FY27 Maintenance – Blackwater System

Maintenance Item	Scope Units	FY26 Budget Scope	FY26 Budget (\$m)	FY27 Budget Scope	FY27 Budget (\$m)	Variance (\$m)
Resurfacing			10.2		10.7	0.5
Mainline	Km	896	8.5	896	8.7	0.2
Turnout	Site	173	1.8	173	2.0	0.3
Rail Grinding			11.0		9.9	(1.1)
Mainline	Km	Redacted	7.8	Redacted	7.0	(0.9)
Turnout	Site	Redacted	3.0	Redacted	2.8	(0.2)
Level Crossing	Track LX	Redacted	0.1	Redacted	0.1	0.0
General Track Maintenance			26.7		27.1	0.4
General Track	Activity		24.2		23.8	(0.4)
Corridor Maintenance	Activity		1.9		2.7	0.8
Ultrasonic Testing	Km	5,042	0.6	4,961	0.6	0.0
Signalling and Telecoms			14.1		16.6	2.6
Electrical			8.7		9.3	0.6
Structures and Facilities			5.7		5.8	0.2
Trackside Systems			1.3		1.4	0.1
Other Civil Maintenance			3.0		2.4	(0.6)
Other General Maintenance			3.3		2.9	(0.4)
Sub-Total			84.0		86.1	2.1
Ballast Undercutting Plant Depreciation			3.1		2.9	(0.2)

Maintenance Item	Scope Units	FY26 Budget Scope	FY26 Budget (\$m)	FY27 Budget Scope	FY27 Budget (\$m)	Variance (\$m)
Total Direct Maintenance Costs			87.1		89.0	1.9
Non-Coal Allocation			(0.9)		0.0	0.9
Total			86.2		89.0	2.8

Note: Figures may not add due to rounding.

Material movements in spend by maintenance category against the prior approved budget are outlined in Table 20.

Table 20 Cost Movements by RIG Category – Blackwater System

RIG Category	FY26B v FY27V	Comment
Resurfacing	\$0.5m	Increase against the FY26 Budget reflects higher labour allocations, partially offset by lower resurfacing plant costs and reduced plant maintenance labour. Scope remains unchanged from FY26.
Rail Grinding	(\$1.1m)	Reduction in mainline scope due to cycle variations, turnout frequency, and additional grinding activities completed in FY26 that are not required in FY27.
General Track Maintenance	\$0.4m	<p>Increase compared to FY26 Budget driven by the following changes:</p> <ul style="list-style-type: none"> Incremental increase in contractor support costs to execute 4 targeted corridor drainage sites, with very poor drainage condition to execute targeted program to improve track and corridor drainage at sites where formation degradation is evident. Additional internal labour support, contractor support and rail materials required to support corrective rail maintenance activity levels. <p>Offset by:</p> <ul style="list-style-type: none"> Reduction in external contractor spend as a result of the internalisation of specific vegetation management activities in the Blackwater & Gracemere Civil district. Partially offset by the transition to aerially deployed granular herbicide to support vegetation management. Reprioritisation of Gladstone civil district resources to support increased maintenance levels in Moura. \$0.8m of variable costs associated with Mine Specific Infrastructure which were included in the FY26 Budget but is not required in FY27. <p>Please refer to Drivers of Change in Maintenance Budgeting Approach – General Track in Appendix 6 – Works End to End Process for additional information on budget assumptions for rail maintenance, targeted drainage and vegetation management activities.</p>
Signalling and Telecommunications	\$2.6m	Increase in labour & material costs is driven by escalations, in addition to an uplift in maintenance activity levels and system allocations for the Control Systems South team in FY27. Movements between budgets reflect changes in labour allocations across RIG categories, following the cessation of the Control Systems South night shift roster, reducing the Other General Maintenance category. System mix allocation has also changed slightly resulting in a slight increase in costs allocated to the Blackwater system, offset by reduction in Moura system.
Electrical	\$0.6m	Increase in FY27 Final Draft Budget is driven by escalations, as well as an uplift in feeder station maintenance activities.

RIG Category	FY26B v FY27V	Comment
Other Civil Maintenance	(\$0.6m)	Reflects assumed reduction in corrective maintenance activity levels and reprioritisation of internal labour resources to deliver critical maintenance support within the General Track category.
Other General Maintenance	(\$0.4m)	Reduction in Other General Maintenance is driven by the cessation of nightshift within Control Systems South, increasing maintenance activities across Blackwater system, predominantly within the Signalling & Telecoms category.
Ballast Plant Depreciation	(\$0.2m)	Ballast undercutting plant depreciation in total is slightly below the FY26B, with the allocation between systems based on the number of days that the ballast plant is expected to be operating in the Blackwater system in FY27.

For additional information on the budgeting approach and assumptions, please refer to Appendix 6: Budget Setting and Procurement.

Figure 17 sets out a summary of historic and budgeted direct maintenance costs by maintenance category. To ensure comparability between periods, the direct maintenance costs presented below exclude depreciation on ballast undercutting plant.

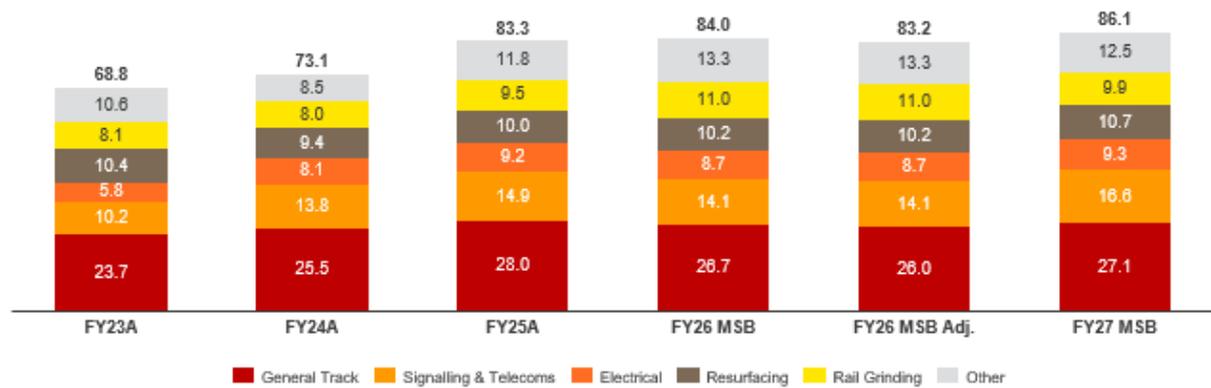


Figure 17 Direct Maintenance Costs by Category – Blackwater System

Figure 18 sets out a summary of historic and budgeted direct maintenance costs by activity type.

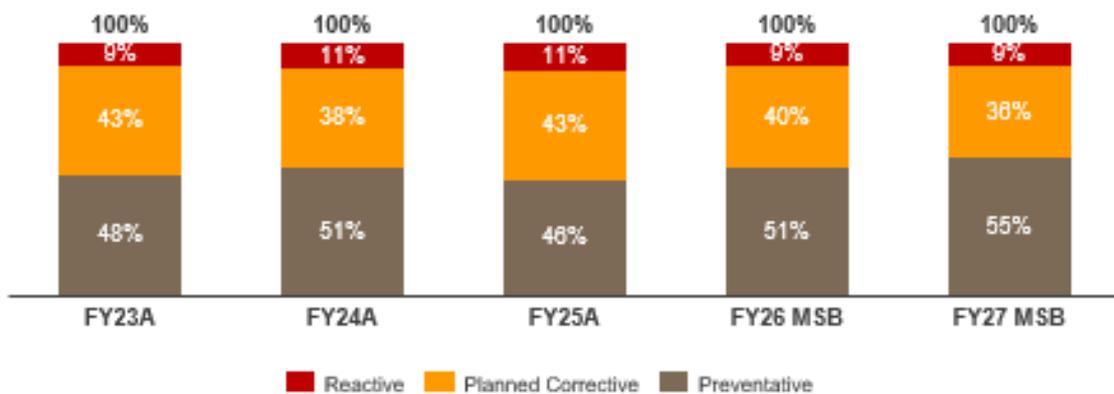


Figure 18 Direct Maintenance Costs by Activity Type – Blackwater System

3.4 Integrated Closure Plan – Blackwater System

Aurizon Network has developed an access plan to deliver the required scope for the Blackwater System while balancing cost and access. Closures are coordinated with Moura to minimise the impact of large-scale works and consider North Coast Line customers.

FY27 will see reduced integrated closure hours, offset by increased single-line activities (460 Integrated Closure hours and 2380 single-line hours).

Table 21 summarises Aurizon Network’s approach, incorporating customer and supply chain feedback received through development of the FY27 MRSB.

Table 21 FY27 Supply Chain Considerations – Blackwater System

Opportunity	Details
Optimising for Throughput	<ul style="list-style-type: none"> Integrated Closures not planned in July 2026 and June 2027 to help maximise throughput. Closures loaded to resource and safe work integration capacity, with single line transitions used where possible to reduce total integrated closure durations (e.g. height limited machinery). High impact scope prioritised for closures to minimise single line impact including high impact BCM Scope locations. Aligned single line scope between disciplines where possible (e.g. RM902 plus bridge rollout, OHLE maintenance plus rerail).
Supply Chain Alignment	<ul style="list-style-type: none"> Aligned with Queensland Rail closures on the North Coast Line (NCL) to reduce cumulative impacts (involving changed team roster pattern).
Closure Timing	<ul style="list-style-type: none"> Closures planned to avoid public holidays, weekends (where practical). Maintained one major closure to a single roster block to maximise internal resources. Considerations for regional events such as Beef Week, Rocky Nats, and significant sporting events to assist accommodation availability for crews Higher ramp up of resurfacing machines within closures, allowing more work to be planned.
Program Staging	<ul style="list-style-type: none"> Callemondah Interlocking Project - Three coordinated closures across Blackwater and Moura to reduce from a large 290hr closure. Visibility of future year renewal scope used to make cost and access efficient decisions. Avoiding high risk scope in the wet season where possible. Turnout undercutting packaged at stations for efficiency and to reset to design.
Integrated Closure Summary	<ul style="list-style-type: none"> 6 planned Integrated Closures and a Gregory branch line closure. May affect the Central West Line (Rocklands to Burngrove) and/or the NCL (Callemondah to Rocklands) or the Gregory Branchline (GG).

Table 22 Planned Integrated Closures and Branch Closures – Blackwater System

FY27 Integrated System Closures													
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
Location		NCL		NCL	LVM		NCL		NCL	NCL	NCL		

FY27 Integrated System Closures

		CWL		CWL	BUR		CWL		CWL	CWL	CWL		
Hours	0	60	0	84	60	0	36	0	36	84	100	0	460

Table 23 Driving Path Scope – Blackwater System

Closure	Driving Path Activities	Location
August 60-hour	Interlocking Renewal	Callemondah
	Track Upgrade	Westwood – Windah
	Formation	Marmor
	Culvert and Level Crossing	Mt Larcom
	RM902 Ballast Renewal	Mt Miller - Aldoga
October 84-hour	Interlocking Renewal	Callemondah
	RM902 Ballast Renewal	Yarwun
	Turnout Renewal	Mt Larcom
	Culvert	Bajool and Marmor
	Rerail, Track Upgrade and Sleepers	Rocklands - Gracemere
November 60-hour	Power Systems Renewal	Yan Yan
	RM902 Ballast Renewal	Crew – Fairhill
	Track Upgrade	Burngrove – Crew
	Culvert and Level Crossing	Gregory
January 36-hour	RM902 Ballast Renewal	Bluff Yard – Boonal
	Excavator Undercut Mainline	Dingo
	Bridge Ballast Renewal	Dingo – Umolo
	Culvert	Memooloo
	Interlocking Renewal	Callemondah
	Rerail	Aldoga – Mt Larcom, Rocklands - Gracemere
March 36-hour	Bridge Ballast Renewal	Memooloo
	RM902 Ballast Renewal	Grantleigh – Edungalba
	Culvert	Boonal and Memooloo
April 84-hour	RM902 Ballast Renewal	Blackwater – Rangal
	Bridge Ballast Renewal	Sagittarius – Rangal and Warren – Wycarbah
	Culvert	Warren
	Track Upgrade	Parnabal - Walton
	Rerail	Tunnel – Edungalba
	Overhead Renewal	Bluff
May 100-hour	Interlocking Renewal	Callemondah
	Culvert	Clinton
	Rerail	Gracemere – Kabra
	RM902 Ballast Renewal	Aldoga – Ambrose
	Formation	Bajool

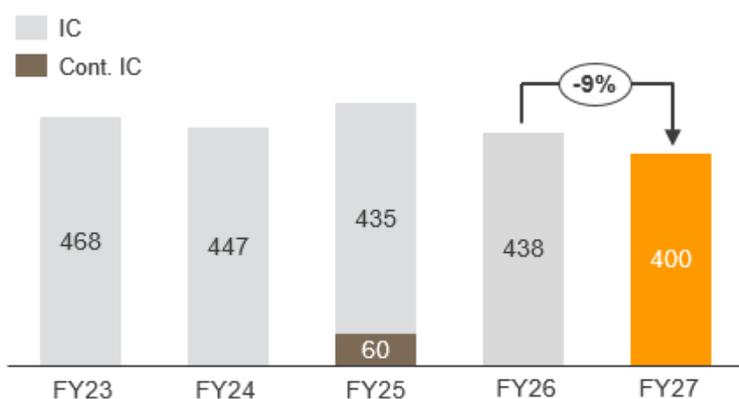


Figure 19 Trend of Integrated System Closure Hours (Mainline Only) FY23-FY27 – Blackwater System

3.5 Four-Year Forecasts – Blackwater System

This section outlines Aurizon Network’s indicative cost forecasts for Maintenance and Asset Renewal activity in each Coal System. Information is provided for this FY27 Final Draft Proposal plus a forecast period of four years (FY28 – FY31).

The FY28 – FY31 indicative cost forecasts are provided to increase transparency on forward looking asset renewals and maintenance expenditure. It is a high-level estimate based on currently available information. The outer year forecasts are predominantly based on the age of the asset and the strategic annual scope target to manage known future resourcing and access constraints where a significant number of assets are forecast to require renewal in similar periods (referred to as the ‘bow wave’ of required investment). For this reason, in a number of circumstances the number of renewals have been identified in each system and the specific site will be identified as further information about asset condition, viability of alternate multi-year asset management approaches, engineering designs, the access footprint and resourcing available to deliver the renewals become available.

Each future forecast will consider the re-phasing of scope from year to year where scope has been deferred into future years or future scope has been brought forward.

Table 24 FY27 Plus Four-Year Maintenance Cost Forecast (Nominal \$m) – Blackwater System

System Maintenance	FY27	FY28	FY29	FY30	FY31
Resurfacing	10.7	11.0	11.3	11.6	11.9
Rail Grinding	9.9	10.7	11.1	11.3	11.5
General Track Maintenance	27.1	28.0	28.9	28.8	30.8
Structures and Facilities Maintenance	5.8	5.9	6.1	6.5	6.7
Other Civil Maintenance	2.4	2.5	2.5	2.6	2.7
Signalling and Telecommunications Maintenance	16.6	17.2	17.7	18.3	18.8
Electrical Overhead	9.3	9.6	9.9	10.2	10.5
Trackside Systems Maintenance	1.4	1.4	1.5	1.5	1.6
Other General Maintenance	2.9	3.0	3.1	3.2	3.3
Total Direct Maintenance Costs (excl. Ballast Undercutting Plant Depreciation)	86.1	89.2	92.1	94.9	97.7

System Maintenance	FY27	FY28	FY29	FY30	FY31
Ballast Undercutting Plant Depreciation	2.9	2.9	2.9	2.9	2.9
Total Direct Maintenance Costs (\$m)	89.0	92.1	95.0	97.8	100.6

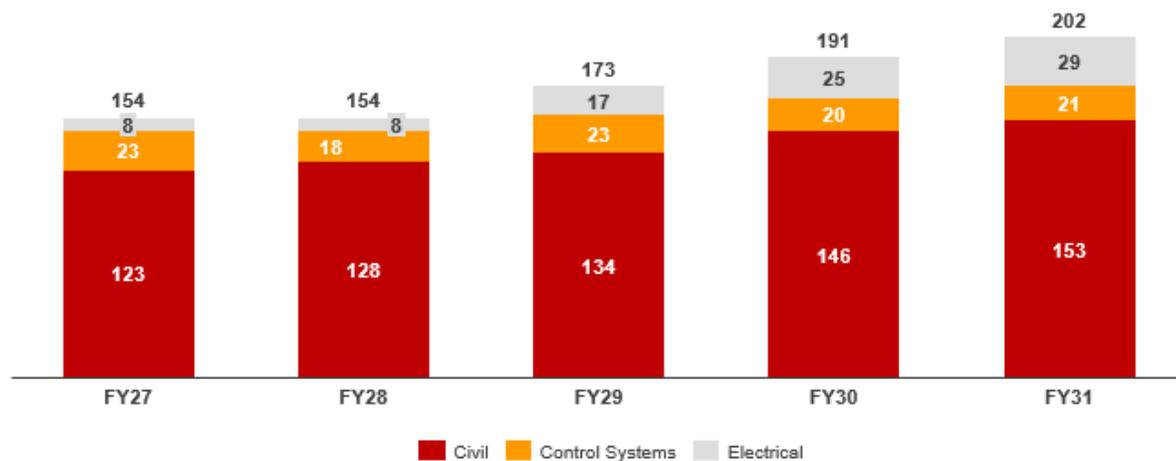
Notes:

- 3.2% escalation has been included for FY28 onwards.
- Rail Grinding forecast includes cost escalation and scope variation year on year driven by anticipated grinding requirements and stable management of rail asset condition. Future estimates are indicative only and may be subject to change and will be iterated in future MRSB submissions for RIG review and approval.
- General Track Maintenance forecast reflects a continued level of rail maintenance activity and targeted drainage works.

Table 25 FY27 Plus Four-Year Renewals Cost Forecast (Nominal \$m) – Blackwater System

Renewals Item	Asset Included	FY27	FY28	FY29	FY30	FY31
Civil Assets		123.2	128.5	133.6	146.3	152.7
Permanent Way	Rail, Track, Sleeper, Turnouts	33.1	37.4	39.3	42.5	44.4
Ballast Cleaning	Mainline and Turnout Undercutting, Bridge Ballast	54.0	53.0	55.5	58.3	60.8
Structures	Culverts, Bridges	15.0	20.2	19.4	22.1	23.0
Civil Renewals	Formation, Level Crossings, Access Points	21.0	17.9	19.4	23.4	24.5
Control Systems	Safe Working, Train Control and Detection, Interlocking, Telecoms, Power Resilience, Transmission, Optical Fibre	23.0	17.9	22.6	19.8	20.7
Electrical Assets	Overhead Renewal, Power Systems, Traction Substation Renewal	7.9	7.7	17.0	24.7	28.6
Total (\$m)		154.0	154.1	173.2	190.8	202.0

Note: 4.4% escalation has been included.



Note: Four-year forecast is indicative only and does not account for access, resource considerations, detailed design and associated costings.

Figure 20 FY27 Plus Four-Year Renewals Cost by Scope Category (Nominal \$m) – Blackwater System

Four-Year Forecast Commentary – Blackwater System

Civil

The Ballast Cleaning program is 40% of the Civil program across the four-year forecast period. It includes on average 58km of ballast undercutting and 23 turnouts.

The renewal of Permanent Way assets is approximately 30% of the civil program and includes an average of 1700 sleepers, 27 rail km, 5 track km (both sleepers and rail) and 4 turnouts per year.

Structures include the renewal of an average of 17 culverts and 4 bridges per year.

The majority of costs in the civil renewal program are attributable to 2.2km of Formation, Level crossings which increase across the 4 years from 2 renewals in a year up to 5 renewals in FY31 (which includes a signal upgrade and cattle crossing work) the access points and roads.

Control Systems

Safe Working Systems – Train Detection, Telecommunication Assets and Transmission and Data Renewals represent approximately 85% of the Control Systems four-year forecast.

Safe Working systems – Train Detection is the replacement of older analogue track circuit assets with modern equivalent axle counters.

Telecommunication Asset renewals are for the replacement of optic fibre.

Renewals for Transmission and Data predominantly include Tetra radio, digital microwave radio, routers, switches and firewalls and power supply.

Electrical

Traction Substation Renewals are approximately 80% of the Electrical four-year forecast in Blackwater. Estimates have progressed from concept estimates to pre-feasibility and are at a higher level of accuracy (Class 4). The estimates will be updated at the conclusion of the 'feasibility' stage of the project in Q2 FY27.

4 Goonyella System

Goonyella System Summary	
Goonyella Asset Management Strategy	Maintain and renew assets to hold the condition at a stable level of performance while seeking to deliver Committed Capacity.
Guidance for Decision Priorities	<p>In determining the trade-off decisions for the renewal programs the following prioritisation has been considered, after discussion with the Rail Industry Group:</p> <ol style="list-style-type: none"> 1. Scope and Access 2. Cost <p>Prioritisation is based on assumptions that demand was increasing and would be slightly lower than Committed Capacity and performance impact of incidents trending lower.</p>
Renewals Budget	<p>Asset Renewals of \$148.4 to renew between 0.04% and 4.8% of system assets with an average condition 4.22 (very poor) and assumes delivery of targeted efficiencies identified in FY26.</p> <p>Compared to the indicative forecast for FY27 included in the FY26 MRSB, FY27 renewals have decreased by \$5.4m, predominantly due to maturing of estimates in Control Systems, Goonyella Ports Overhead renewals and Traction substation renewals.</p> <p>Compared to the FY26 Budget, FY27 renewals have increased by \$15.1m due to Control Systems which is reflective of the reduction in FY26 scope to provide stability in the delivery of the program year on year, maturing of estimates for the Goonyella Ports Overhead renewals and Traction substation renewals, partially offset by reductions in ballast mainline undercutting costs due to improved screenability.</p>
Maintenance Budget	<p>Direct Maintenance Cost Allowance of \$82.1m (excluding ballast undercutting plant depreciation) and assumes delivery of targeted efficiencies identified during FY26. General Track maintenance, Signalling & Telecoms and Resurfacing activities represent 61% of the system spend.</p> <p>To maintain asset condition and reliability, a targeted drainage program has been included, together with a higher level of corrective maintenance activity to support the General Track Maintenance program. The FY27 Final Draft Budget is \$3.5m higher than the FY26 Budget.</p>
Integrated Closures and Capacity Impact	<p>System has sufficient capacity to meet Committed Capacity and includes:</p> <ul style="list-style-type: none"> • Reduction in total mainline closure hours by 23% compared to FY26, with 5 planned Integrated Closures and 2 branch line closure. • Increase in single line activity with lower impact renewal activity planned outside of Integrated Closures.
Opportunity and Risks	At +/-10% estimate, Renewals upper and lower value range is \$160.3m and \$131.1m.

4.1 Asset Management Strategy – Goonyella System

The asset management strategy for the Goonyella System is to maintain and renew assets to hold the condition of the assets at an appropriate level that will promote the safety, reliability and performance of Goonyella System Rail Infrastructure while seeking to deliver Committed Capacity.

The Goonyella System is the largest Coal System by coal volume throughput. The Goonyella System services coal mines in the central and northern Bowen Basin, predominantly carrying product to the ports at Dalrymple Bay and Hay Point. The Goonyella System includes approximately 1,006km of electrified track.

Loaded trains move predominantly east towards the ports at Dalrymple Bay, but some traffic originating in the Goonyella system rails north to Abbot Point via the Newlands System, or south to Gladstone via the Blackwater System, so loaded trains operate in both directions in the western areas.

The arrangement of the Black Mountain range crossing requires good condition and robust assets including track structure to operate under the train load and intensity, but also significant drainage structures to move water away from the railway in rain events.

The system is predominately serviced by electric traction, so feeder stations are located closer together in Goonyella than in Blackwater, and the impact of an outage is magnified in the system with little ability to substitute rollingstock during electrical outages.

In January 2025, demand for FY27 was estimated to be increasing and slightly lower than Committed Capacity. Noting that the 4-year average for performance impact of incidents has trended lower, where a decision has been required to be made in the development of the Final Draft Proposal, the delivery of renewal and maintenance scope and preservation of access for train services have been prioritised equally. The following are examples of this decision making for the Goonyella System:

- Two ballast undercutting scopes were put forward for FY27 renewal at Norwich Park at the 118.2km and the 108.26km with similar future asset condition ratings of 3.8. Assessment during the development of the integrated closures and single line possessions identified renewing both items of scope in FY27 would have a high impact to customers. It was determined to renew the 108.26km scope in FY27 and defer the 118.2km scope to FY28. This would reduce the impact to customers in FY27 while completing the scope with the highest level of fouling. The 118.2km site will be monitored and maintained until renewal tentatively proposed in August 2027.

Asset Renewal Strategy – Goonyella System

The Goonyella System is a purpose-built Coal System and has seen significant expansions both in terms of extensions and section duplications. There is a mix of asset conditions given age and use.

Table 26 Asset Profile – Goonyella System

Renewal Item	Comment
Civil Assets	The civil assets in the Goonyella System see the highest tonnage of the four Coal Systems and the highest train density, this decreases the expected time between intervention for renewal and maintenance activities that are linked to usage or wear. The Great Dividing Range crossing at Black Mountain is a significant rail crossing with steep grades and tight curves resulting in significant train dynamics and inertia forces applied to the rail, sleeper and formation assets. Given the steepness of the terrain and the fact that the area can record high rainfall in short periods, there is a significant network of drains, culverts, and spillways to assist water to shed from the mountainous areas, aiming to minimise impact on rail operations.
Control System Assets	A significant proportion of the Goonyella Control Systems assets are original 1980's infrastructure. These assets are nearing or beyond their nominal service life, in

Renewal Item	Comment
	<p>particular signal interlocking to ensure the safe separation of trains. Trains are detected through a mix of track circuits and axle counter track sections with ongoing renewals programmed for life-expired track circuit assets. A program to modernise the optic fibre in Goonyella commenced in FY22 and continues in FY27.</p> <p>A Network Cyber Security Project has been established to deliver an industry-aligned model that provides separate security zones for Information and Operational technology systems. The transition of OT Systems to the segregated environment requires the migration of 24 discrete systems structured into three stages to improve delivery efficiency, cost control and interface risk management. Stage 1 focuses on the migration of high priority mission critical systems (7 of the 24 systems, representing 29%). This approach reduces operational and cyber exposure as quickly as possible while establishing repeatable migration patterns that will inform more accurate cost and schedule estimates for subsequent stages. Accordingly, the FY27 budget only provides for delivery of Stage 1, with additional customer engagement to finalise the approach for Stages 2 and 3 planned in FY26 and FY27.</p>
Electrical Assets	<p>The Electrical assets were largely installed during the mid-1980's Main Line Electrification Project. A significant proportion of the substation assets are approaching the end of their 30 to 40-year design life. A focus of FY27 is the Feasibility phase of the Substation Renewals Program and early procurement of long lead items. The Goonyella Ports OHLE renewal project includes corrosion remediation to address the significant corrosion due to the coastal environment and mechanical separation to limit the impact of future dewirements. The mechanical separation works will conclude in FY26 and corrosion remediation works will commence in FY27 and continue to FY30.</p>

Each year, the renewal scope is selected and prioritised for delivery based on the condition of the asset and criticality of the asset location. Appendix 2 – Renewal and Maintenance Strategies by Asset Class provides the process of scope identification including the assessment of condition and criticality for each asset class, the maintenance activities, determinates of asset renewals, typical scope requirements and supply chain risks being managed.

Asset Maintenance Strategy – Goonyella System

Maintenance activity is focused on inspecting and maintaining the in-situ condition of assets, repairing or implementing and maintaining minor holding works (including Temporary Speed Restrictions) following identification of a defect or infrastructure failure to minimise the impact and duration of unplanned outages.

The planned and preventive maintenance activities and inspections, including the planned mechanised production scope, as per the requirements of Aurizon Network's Asset Maintenance and Renewal Policy and associated standards. The inspection regime and frequency are based on asset type, condition and location with defined intervention frequency levels. These can include:

- Usage-based - Example: track resurfacing is required every 50 million gross tonnes.
- Time-based - Example: turnouts requiring weekly visual inspections and a detailed annual inspection.
- Age-based - Example: 22.5 tonne axle load concrete sleepers being replaced every 40 years.
- Fix on failure.

The scope of planned corrective and reactive maintenance tasks is heavily dependent on the faults identified via the planned inspection programs.

Aurizon Network has assumed that in FY27 the Goonyella System will see a similar level of faults that require planned corrective or immediate response as in prior years using the 3-year average and adjusted for known or anticipated risks.

Table 27 summarises the assumptions for the Goonyella System for material maintenance items where the scope assumptions are different to the 3-year average.

Table 27 Asset Maintenance Profile – Goonyella System

Maintenance Item	Comment																				
Resurfacing	<p>12% of maintenance budget.</p> <p>Track resurfacing restores the health of the track and ballast assets. It can be both condition or tonnage-based intervention and can be both preventive and corrective. Preventative resurfacing scope is developed using track geometry data captured with ATIS together with historical failures and weather factors.</p>																				
Rail Grinding	<p>15% of maintenance budget.</p> <p>Preventative grinding strategy with small amount of corrective allowance to reduce rail breaks and extend the life of rail. Tonnage based intervention translated to time-based frequency to allow long term planning.</p>																				
General Track	<p>27% of maintenance budget.</p> <p>Replace rail, turnout maintenance and GIJ and welds represent 33% of costs</p> <p>Rail maintenance is expected to be higher than the 3-year average. Inspections and incidents have seen higher number of rail defects and corrective work activity throughout FY25, predominantly replacing rail due to older, life expired fatigued rail. In FY25, the number of rail repairs was 26% higher than the average number of rail repairs from FY23 to FY25, and the number of defects identified by non-destructive testing (ultrasonic) grew by 70% in FY25 compared to the prior three years.</p> <p>Vegetation management supports safety through line of sight and egress to the corridor for train crew, maintenance workers and public at level crossings. Additionally, good vegetation management helps prevent electrical faults related to trees and branches falling on overhead line equipment.</p> <p>The Targeted Drainage Program is a strategic initiative designed to address compromised longitudinal drainage adjacent to track infrastructure. This typically occurs within cuttings and embankments where natural erosion, compounded by wet weather, leads to siltation and blockage of drains. It is a 5-year program in addition to the localised drainage maintenance that focuses on sites of less than 100 metres with identified defects to be repaired in that year.</p> <p>At the completed targeted drainage sites, a steady ongoing drainage maintenance program as part of localised drainage maintenance in the General Track Maintenance category is planned to maintain drainage paths and minimise natural erosion and siltation levels. The following sites are included for FY27.</p> <table border="1"> <thead> <tr> <th>Section</th> <th>Drainage Asset Condition Rating</th> <th>Drainage Asset Condition Definition</th> <th>Nominated Priority</th> </tr> </thead> <tbody> <tr> <td>Millenium – Red Mountain</td> <td>3.5</td> <td>Poor to Very Poor</td> <td>Very Highly Recommend</td> </tr> <tr> <td>Ingsdon – Millenium</td> <td>3.4</td> <td>Poor to Very Poor</td> <td>Very Highly Recommend</td> </tr> <tr> <td>Wandoo – Waitara</td> <td>3.5</td> <td>Poor to Very Poor</td> <td>Very Highly Recommend</td> </tr> <tr> <td>Lake Vermont – Dysart</td> <td>4.0</td> <td>Very Poor</td> <td>Recommend</td> </tr> </tbody> </table>	Section	Drainage Asset Condition Rating	Drainage Asset Condition Definition	Nominated Priority	Millenium – Red Mountain	3.5	Poor to Very Poor	Very Highly Recommend	Ingsdon – Millenium	3.4	Poor to Very Poor	Very Highly Recommend	Wandoo – Waitara	3.5	Poor to Very Poor	Very Highly Recommend	Lake Vermont – Dysart	4.0	Very Poor	Recommend
Section	Drainage Asset Condition Rating	Drainage Asset Condition Definition	Nominated Priority																		
Millenium – Red Mountain	3.5	Poor to Very Poor	Very Highly Recommend																		
Ingsdon – Millenium	3.4	Poor to Very Poor	Very Highly Recommend																		
Wandoo – Waitara	3.5	Poor to Very Poor	Very Highly Recommend																		
Lake Vermont – Dysart	4.0	Very Poor	Recommend																		

Maintenance Item	Comment			
Macarthur – Coppabella		3.5	Poor to Very Poor	Highly Recommend
Yukan – Black Mountain		3.5	Poor to Very Poor	Highly Recommend
Daly Bay Arr – Daly Bay Ict		4.5	Very Poor to Failed	Very Highly Recommend

Note:

Required: Have been assessed as having a very poor condition, compared to all sites in the CQCN have a higher performance impact, higher number of formation failures and a lower \$/t capacity benefit.

Very Highly Recommended: Have been assessed as having at least 3 of the 4 benefits of 'Required'.

Highly Recommended: Poor to very poor condition, with either high history or potential performance impact or high number of formation failures historically.

Recommended: Very poor condition with lower historical or potential performance impacts and lower number of formation failures.

Further information on the drivers of change in General Track maintenance can be referenced in Drivers of Change in Maintenance Budgeting Approach – General Track in Appendix 6 – Works End to End Process.

Trackside Systems

3% of maintenance budget.

Trackside system assets do not wear with tonnage and often show little sign of degradation until failure occurs. These assets typically experience a stable period after installation where failure rates remain low, however, as components age and reach the end of their service life, the likelihood of failure increases rapidly. Maintenance is focused on inspection, servicing and monitoring of the asset. FY25 has seen an increase in infrastructure protection incidents by 10% from the previous year, driven by dragging equipment and hot bearing detector faults, resulting in increased corrective maintenance costs.

Performance Trends – Goonyella System

The trend of 4- year averages for cancellations, delays and incidents provide an indication of the performance impact to customers of the asset management strategy over the short and medium term and is the one factor in determining asset renewal scope.

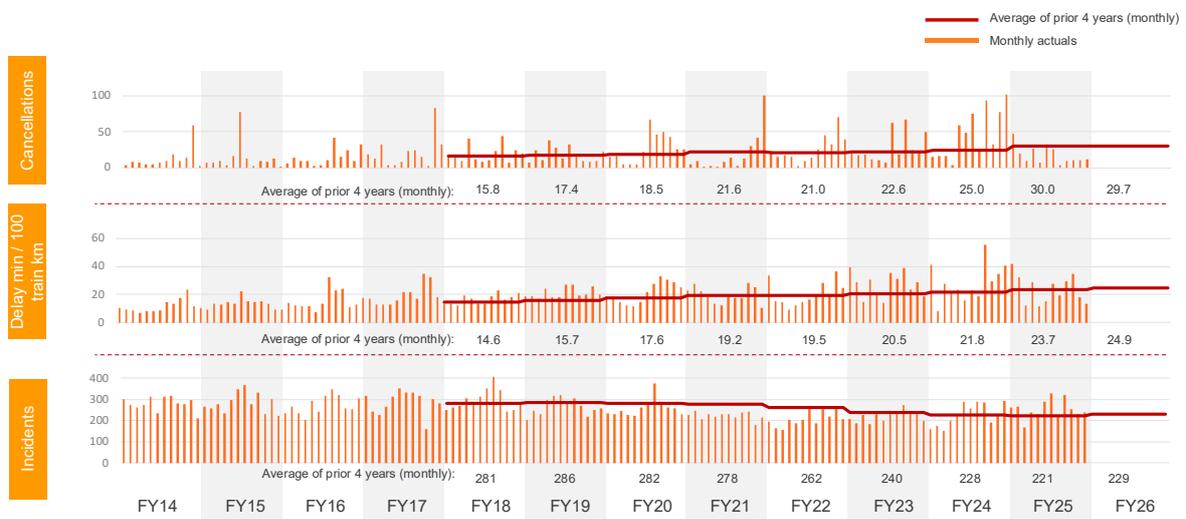


Figure 21 4-Year Average Performance Trends – Goonyella System

The 4-year average for below rail delays have increased significantly over time in Goonyella, primarily driven by TSRs, track maintenance and repairs. The Network stowing delay code, which was introduced in FY22, contributes over 4 minutes of the increase. Below rail cancellations have been rising, driven by high-impact incidents in the Civil and Electrical disciplines, but noting significant improvement in FY25. Performance data is provided below for track, electrical and control system assets, including where performance trends have influenced asset renewal scope. Please refer to the Glossary for interpretation of these graphs.

Permanent Way

Permanent Way incident types are comprised Track, Structures and Derailments (which are the result of a track defect). Figure 22 and Figure 23 show incident hotspots in the Goonyella System and the 4-year average trend for cancellations, delays and incidents. Incidents tend to concentrate in areas with a high level of asset density. Coppabella, Winchester and Hatfield are the top 3 stations in terms of incident count over FY22-FY25.

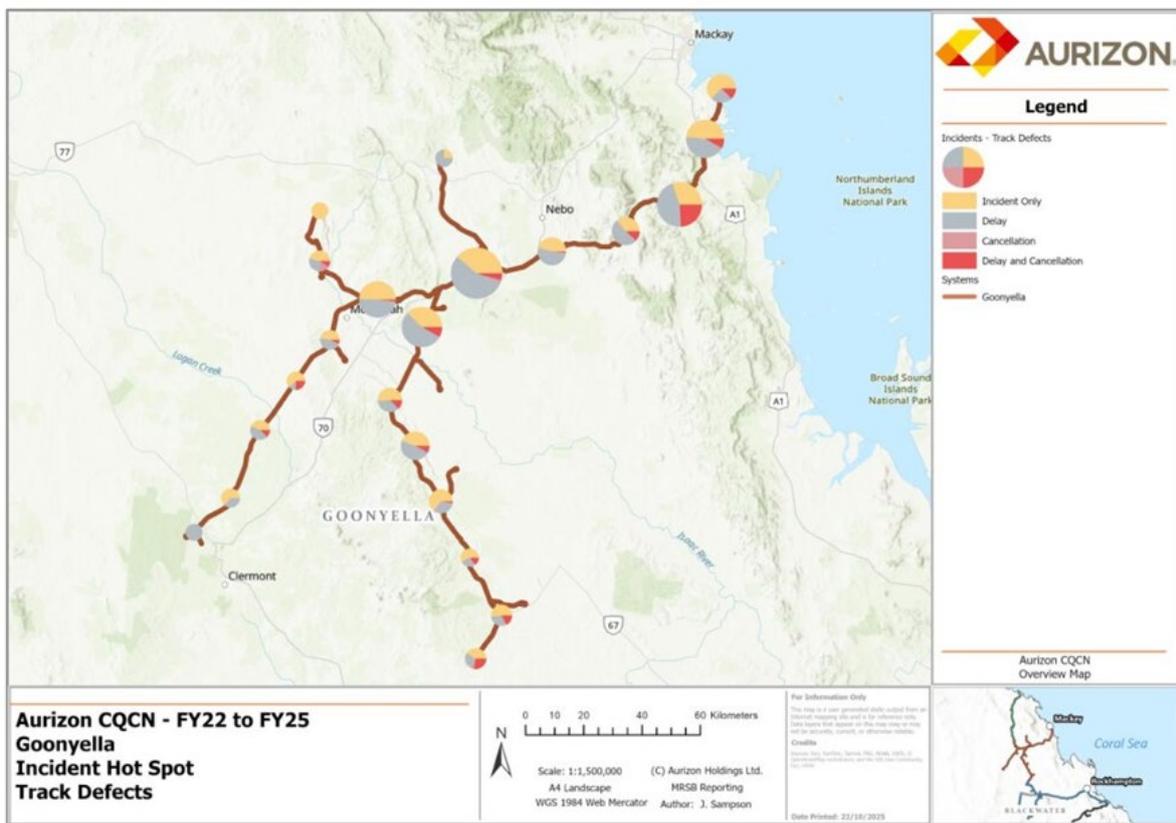


Figure 22 Permanent Way Incidents FY22-FY25 – Goonyella System

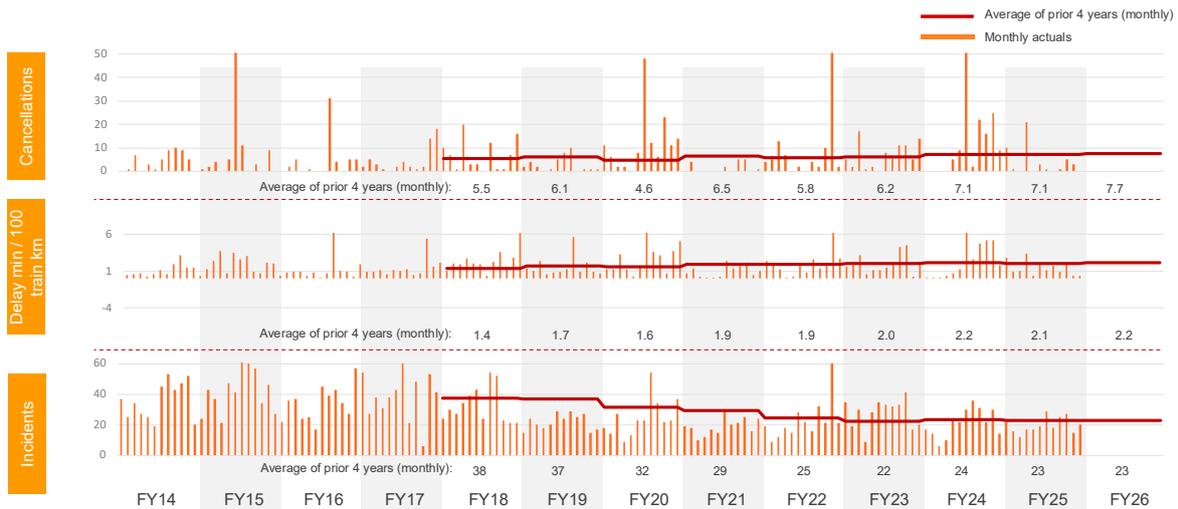


Figure 23 Permanent Way 4-Year Average Trends FY14-FY25 – Goonyella System

Key trends relating to Permanent Way have been identified:

- Permanent Way incident numbers have reduced over time, have been stabilising in recent years. While overall incident numbers remain steady, there are some notable trends in Permanent Way incident sub-categories:
 - Two trends visible in FY25 impact the FY27 maintenance and renewals program. A reduction in Broken Rails was observed in FY25, while the number of ultrasonically detected faults have increased, impacted by transverse weld defects. The ultrasonic program has proven effective in identifying rail defects before rail breaks occur.
 - Rail Renewals in FY27 are directed at sections of track to primarily address rail wear.
 - Rail renewals scope between Yukan, Black Mountain and Hatfield will improve a section of track that have had significant operational impact from Permanent Way incidents. During FY24 and FY25 these locations accounted for 25%-27% of total delays and cancellations.
- Overall, the locations for Rail and track upgrade renewals for Goonyella in FY27 are aligned with 30% of permanent way incident occurrence and 50%–58% of delays and cancellations. Notwithstanding, that site selection is based on multiple factors, of the sites selected an elevated level of incidents cancellations and delays has been observed. Temporary speed restrictions as measured by Delays minutes/100km have been fluctuating between an average of 4.6 in FY22 and 6.0 in FY24. 4-year average is 5.4 min/ 100km. TSRs are cyclical and are usually more prominent with more rainfall.
- In FY27, three turnouts at Hatfield and four turnouts at Praguelds have been targeted for full renewal.
 - Asset failures at Hatfield have increased in frequency over the last couple of years. Misalignment of the track beneath section insulators has caused damaged to locomotive pantographs and significant operational impact. The condition of Turnouts at Hatfield are rated as very poor with 64 cancellations and 69,000 delay minutes in FY24 and FY25.
 - Turnout condition at Praguelds is deteriorating and is now considered very poor, with 11 cancellations and 7426 delay minutes directly attributed to turnout and points faults across

FY24 and FY25. The renewal planned for FY27 at Pragueland is stage 2 of a multi-year project.

- As the turnout population ages, there is an expectation of increasing allocation of component renewals to reactively manage turnout failures in FY27 and future years.
- Reactive formation renewals have seen an increase between FY21 and FY25. A total of 1.7km of formation renewals has been planned for FY27. Aurizon Network’s strategy is to slow the degradation rate of the formation through improved drainage capability in the corridor.
 - Formation renewal at Winchester and Broadlea, will improve sections of track with elevated levels of geometry related incidents linked to poor formation condition.
 - Targeted drainage sites for FY27 are aimed to address areas of the network, predominantly cuttings and embankments with poor drainage. FY26 Q1 speed restrictions have been impacting Jilalan, Yukan, Pragueland, Bolingbroke among other locations. These sections of track are where ballast renewals in FY27 will be concentrated. Renewals at these sites will significantly improve track alignment and stability.

Electrical Defects

Electrical defects are comprised of Trips, Dewirements and Obstruction/Malfunction. The electrical incidents are reasonably evenly distributed with Coppabella, Hatfield and Dalrympe Bay being the top 3 stations in terms of incident count over FY22-FY25. Figure 24 and Figure 25 show incident hotspots in the Goonyella System and the 4-year average trend for cancellations, delays and incidents.

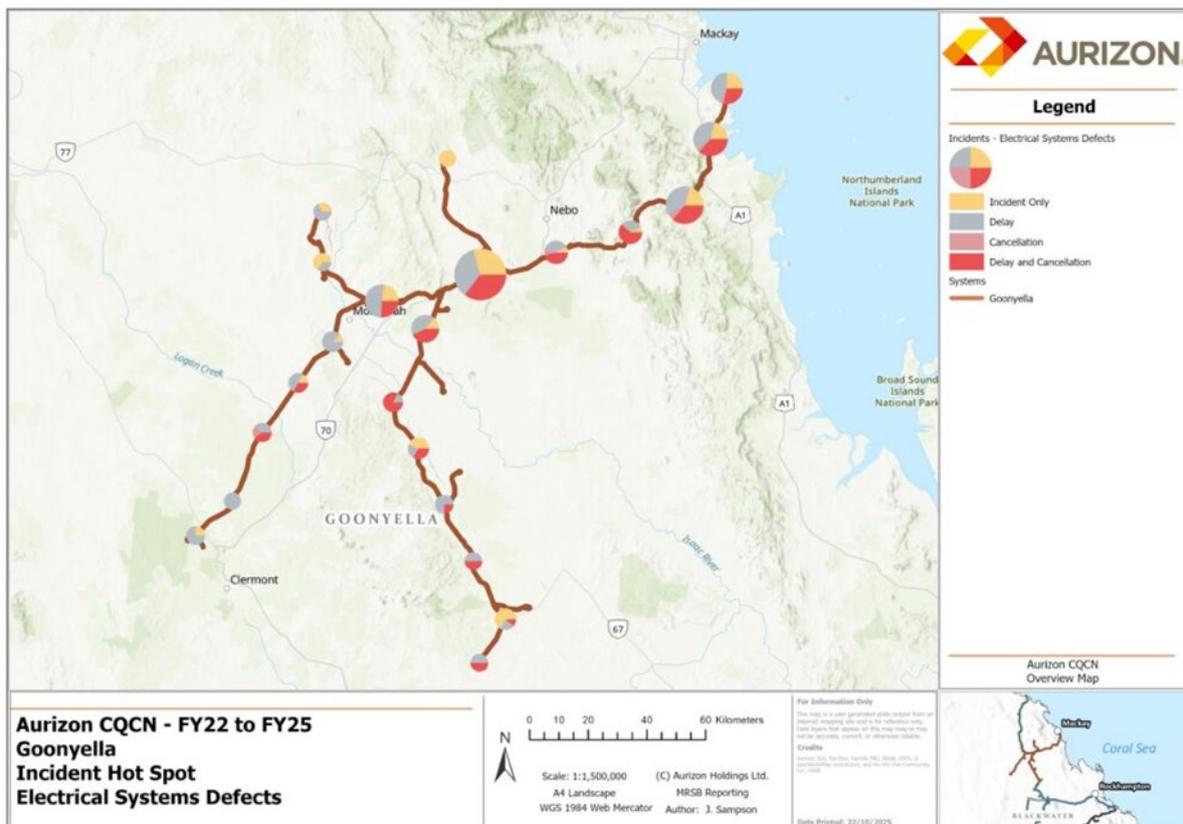


Figure 24 Electrical Defect Hotspots FY22-FY25 – Goonyella System

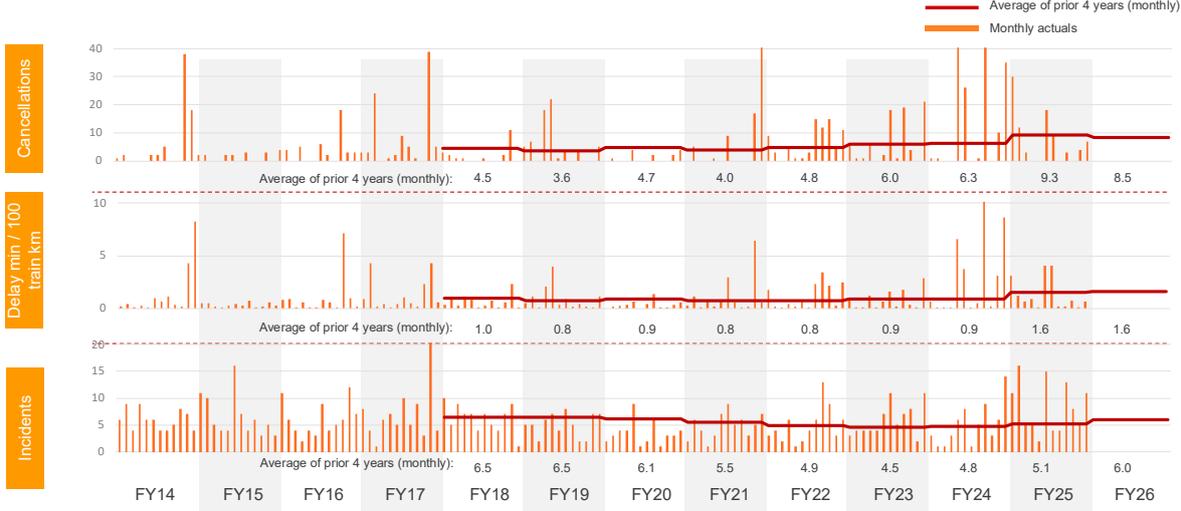


Figure 25 Electrical Incidents 4-Year Average Trends FY22-FY25 – Goonyella System

Key trends relating to electrical incidents have been identified:

- The 4-year average for Electrical faults has remained within a range of 4.5 to 6.5 per month since FY18. In FY25, there was an increase in faults related to trips, component faults and section insulators. Hatfield and Coppabella locations were most impacted in FY25 with 11 and 16 incidents respectively.
 - Turnout condition deterioration at Hatfield has contributed to track and overhead geometry misalignment at section insulators. The turnouts renewals planned at Hatfield will improve geometry and reduce risk of further issues at section insulators.
- In FY24 there were 3.3 cancellations per electrical incident, which reduced to 0.7 cancellations per incident in FY25. This was a result of six incidents with 10 or more cancellations in FY24, while there were only two such incidents in FY25. These high-impact incidents were all related to either dewirements or section insulator issues.
 - Significant reliability interventions have targeted section insulator misalignments and 7-strand catenary wire related incidents. The most recent catenary wire failure occurred in January 25.
- The FY27 Overhead Line Equipment renewal scope will include small component renewal Jilalan and Praguellands. These locations experienced 5 incidents resulting in 28 cancellations in FY24.
- Feeder Wire Clearance Improvements at Balook in FY27 will address reliability issues due to inadequate clearance between the high voltage wires and the structures they are mounted on which allows wildlife to breach the gap contributing to ‘trips’ of the OHLE.

Control Systems Faults

There is a wide array of control system defect types including Points failures, Track Circuit and Signal failures. A significant number of Control Systems faults are located around the Wotonga Coppabella area and Yukan to Jilalan. Coppabella, Jilalan and Dalrymple Bay are the top 3 stations in terms of incident count over FY22-FY25.

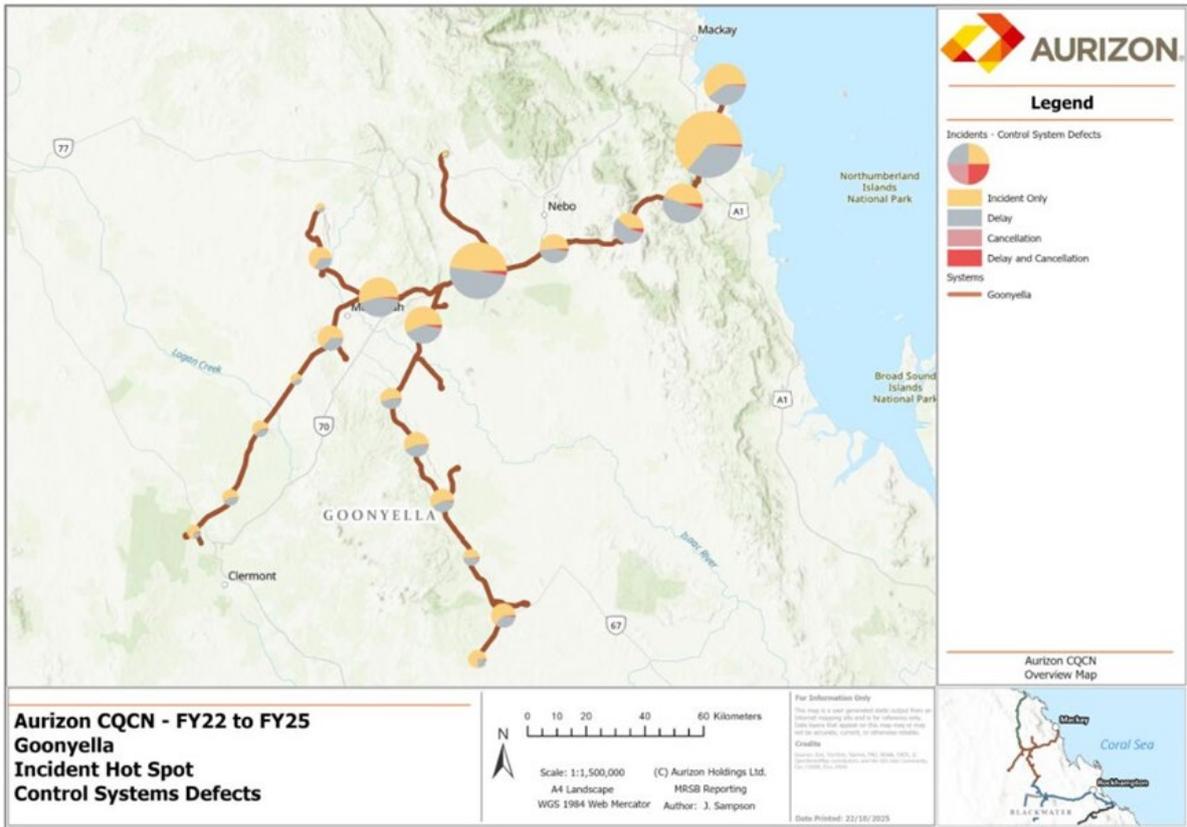


Figure 26 Control Systems Incidents Hotspots FY22-FY25 – Goonyella System

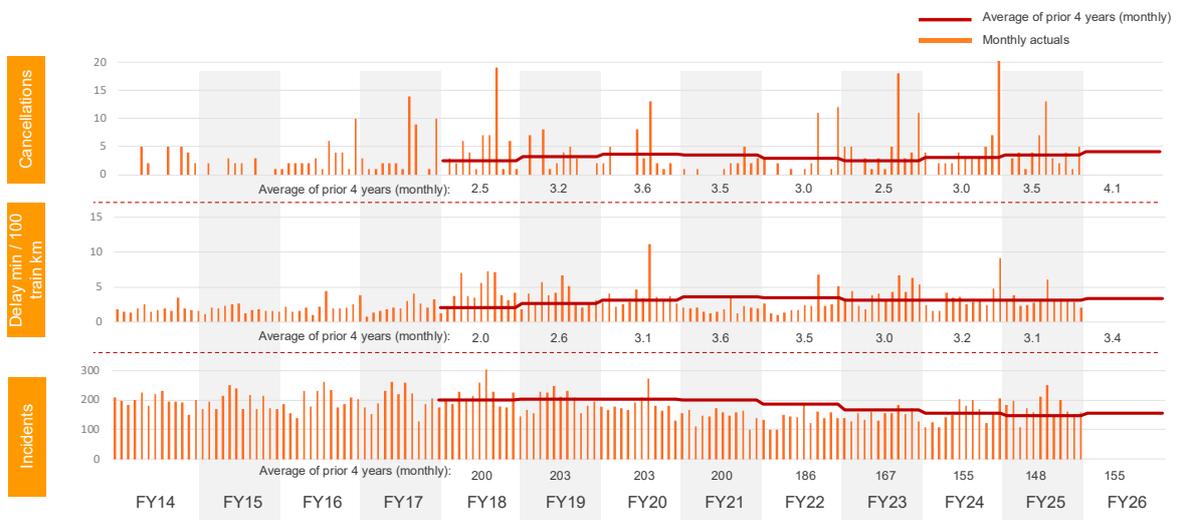


Figure 27 Control Systems Incidents 4-Year Average Trends – Goonyella System

Key trends relating to Control Systems have been identified:

- While Control Systems incidents increased in FY25, the longer-term trend is reducing over time. The increase in incidents in FY25 was driven primarily by Points failures and Track Circuit failures.
 - The interactive nature of Points machines and turnouts means that a turnout in poor condition can impact the operations of the Points machines.

- Points machines renewals at Dalrymple Bay targets a location that has seen over 100 incidents per year in FY24 and FY25.
- A program to replace obsolete ML track circuits with more reliable Axle counters will see renewals at Riverside and Ingsdon in FY27 with further renewals planned for subsequent years.

4.2 Renewals Budget – Goonyella System

Aurizon Network’s FY27 Final Draft Proposal for the Goonyella system provides for an Asset Renewals requirement of \$148.4m. The FY27 renewal program is proposing to renew between 0.04% and 4.8% of system assets by asset category and the average condition of Goonyella system renewals (excluding reactive and strategic) are 4.22 (very poor).

The FY27 Final Draft Proposal is \$5.4m lower than the indicative forecast for FY27 included in the FY26 MRSB and \$15.1m higher than the FY26 Budget.

This section provides a comparison of the scope selected for FY27 against the indicative forecast for FY27 included in the FY26 MRSB as well as the FY26 Budget. Variation in costs is as compared to the FY26 Budget.

FY27 Renewal Scope Selected – Goonyella System

Figure 28 and Figure 29 provide visual representations of the distribution of Civil, Electrical and Control Systems scope across the Goonyella System. While most work is proposed for the mainline, work is also proposed for branchlines and individual balloon loops.

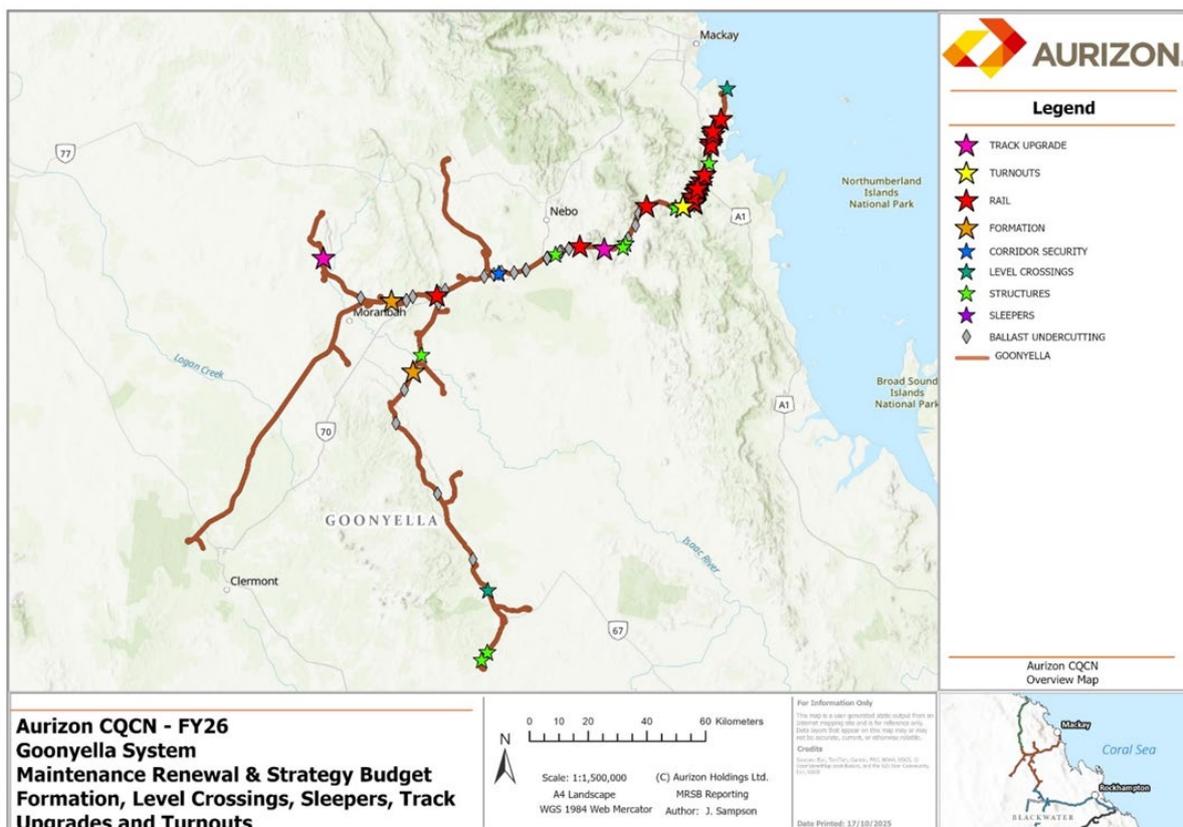


Figure 28 FY27 Civil Asset Renewal Locations – Goonyella System

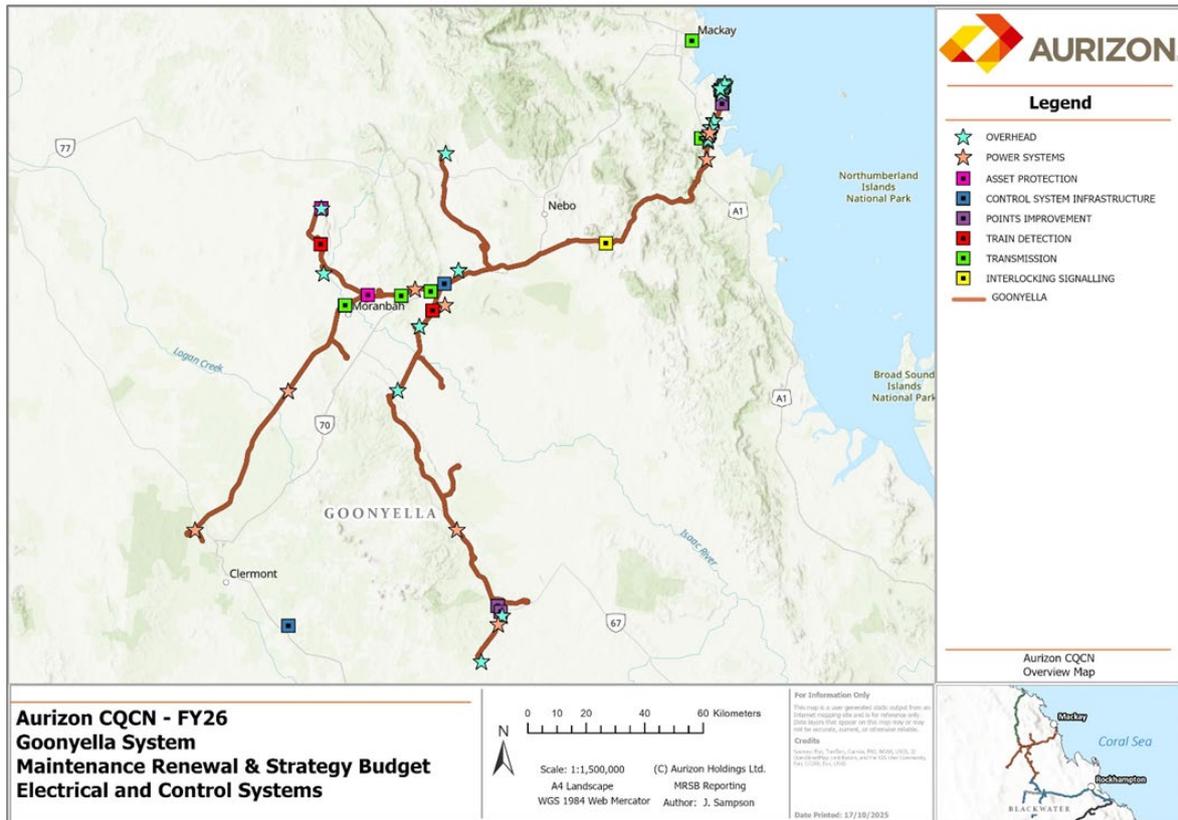


Figure 29 FY27 Control Systems and Electrical Renewal Locations – Goonyella System

The selection of scope each year is a product of multiple factors, depending on the asset class, that contributed to the assessment of condition and criticality. Information is provided in Performance Trends – Goonyella System on those elements of the renewal program that are correlated with System performance trends, the commentary below informs the scope selection for:

- driving scope for integrated closures or for a large proportion of single line possessions to support the impact on available capacity
- scope which has a complex delivery or the mix of scope items results in a material change in costs compared to FY26, or otherwise is
- scope which is material for the asset class and is also a substantial part of the budget in total.

This provides demonstration of the application of both the asset strategy and the process for selecting scope.

Rail/ Sleepers/ Track Upgrade

The combination of Rail Renewal, Sleeper Renewal and Track Upgrades includes 40.828 rail km and 14,219 sleepers for replacement. The rail renewal represents 2% of the total rail km and the sleeper renewal reflects 0.4% of track km in the Goonyella System. The 16.5 rail km between Pragueland and Black Mountain is equivalent to 80% of the total rail scope. This scope has a future asset condition of 3.6 (poor to very poor). It has seen multiple defects through the curves and has reached its wear limits. The 2.4 rail km being renewed between Jilalan and Yukan is future condition rated 3.5 (poor to very poor) and is driving scope for the February 36 hour closure.

The Wandoo Track Upgrade represents 99% of the total track km for Track Upgrades. It has a future condition rating of 3.8 (poor to very poor), has reached its wear & fatigue limits and has defects showing. Sleeper renewal portion of these works includes replacing fist clip sleepers. This Track Upgrade is driving scope for both the August 108 hour closure and the April 60 hour closure.

The Sleeper Renewal program consists of a renewal at Broadlea of 657 sleepers which has a future condition of 3.5 (poor to very poor). The renewal replaces existing fist clip sleepers with e-clip sleepers.

Turnout Renewals

The FY27 Turnout renewal program includes three turnouts at Hatfield & four turnouts at Praguelds. These turnouts are life expired and will be replaced with modern day equivalent to standardise and ensure safe operations.

The Turnout Renewal at Hatfield is driving scope for the October 60 hour closure & April 60 hour closure. This is a full turnout renewal and has a future condition rating of 4 (very poor).

The Turnout Renewal at Praguelds is driving scope for the August 108 hour closure, noting this renewal is delivering stage 2 of these works with stage 1 being completed in FY26. This is a full turnout renewal and has a future condition rating of 4.0 (very poor).

Ballast Cleaning

The Mainline Undercutting program proposes 43.9 km of ballast cleaning with 96% of the scope to be delivered by the ballast cleaning machine (RM902) and the remainder by excavator. Ballast undercutting at each of these sites will improve ballast condition and reinstate free drainage of track structure resulting in an improvement in track alignment and stability.

The program includes renewals across 16 sites in Goonyella with large renewals in Balook, Bolingbroke & South Walker. With Bolingbroke, Jilalan, Peak Downs, Waitara, Wotonga & Yukan sites being driving scope for closures. The three larger sites are:

- At Balook, 6.269km will be undercut. This site has a future condition rating of 4.0 with fouling between 40 and 55 PVC (above the 38% intervention threshold). This location has seen cancellations, TSR's and associated delays because of track alignment and ballast condition.
- At Bolingbroke, 5.895km (across 3 sites) will be undercut. This site has a future condition rating of 3.4 with fouling 58 PVC. This location has seen cancellations, TSR's and associated delays because of track alignment and ballast condition.
- At South Walker, 4.268km will be undercut. This site has fouling of 33 PVC (from 2024 GPR run), a future condition rating of 3.5 and has seen cancellations, TSR's and associated delays because of track alignment and ballast condition.

The Turnout Undercutting program will see 19 sites renewed, including an allocation of reactive renewals for 4 sites. Of the remaining 15 sites planned for renewal, the future condition ranges from 3.6 (poor to very poor) to 4.5 (very poor to failed), with an average condition of 4.2. The Turnout Undercuttings at Jilalan, Yukan and Waitara are driving scope for closures in FY27.

Culvert Renewal

The Culvert Renewal program includes renewals across 11 sites in Goonyella, including an allocation for one reactive renewal site. The 10 renewals planned for FY27 include 3 Reinforced Concrete Box Culvert renewals and 2 Reinforced Concrete Pipe renewals, 4 Cured In Place Pipe lining and 1 Eliminate and divert. All sites have a future condition rating of 4 (very poor) or above.

- The renewal at Yukon is driving scope for the April 60 hour closure. This will involve the removal and replacement of a 22.84m Reinforced Concrete Box Culvert. This culvert is future condition rated 4.5 (very poor to failed) due to observed sinking under the mainline which increases the risk of track alignment issues leading to derailment.
- There are two renewals at German Creek (144.58km and 147.88 km). The 144.58 involves the remove and replace of reinforced concrete pipe that is rated 4.5 (poor to very poor) where the existing corrugated metal pipe under the access road is showing evidence of crushing, together with advanced corrosion that could lead to partial collapse blocking the culvert entirely. This scope is driving scope for the November 60 hour closure. The 147.88km culvert renewal will see the existing corrugated metal pipe renewed with cured in place pipe, avoiding access impacts associated with a total replacement. The culvert is future condition rated 4 (very poor) and has severe corrosion with holes in the steel.
- The culvert at the 62.8km at Balook is future condition rated 4 (very poor), has severe corrosion in various places throughout and is corroded right through in places. This culvert will be removed and water flow diverted to a nearby culvert at the 62.67km that was renewed in FY20.

Level Crossing Renewal

Two level crossing renewals have been identified at Norwich Park and Hay Point. The Level Crossing at Hay Point Road is future condition rated 3.5 (poor to very poor), with track pumping, rail wear, significant rail defects including on the rail head and corrosion, and track geometry issues. The Level Crossing at Booroondarra Road is future condition rated 4.5 (very poor to failed) with complaints received regarding inadequate sighting distances and steep grades. The site has received funding for a signal upgrade as part of the renewal under the Regional Level Crossing Upgrade Fund with completion required by Quarter 2 FY27 to be eligible to receive the funds.

Formation Renewal

The FY27 Formation program will see 2 major renewals at Broadlea & Winchester, both of which are driving scopes for August 108 hour closure. Formation Renewal scope includes an allocation for reactive works for 0.74km, which will be drawn down on during FY27.

At Broadlea there is 0.45km of formation renewal which will be integrated with a sleeper replacement. The future condition score is 4.5 (very poor).

At Winchester, 1.25km of formation renewal requiring the removal and reinstatement of Bajool Turnouts 7C/D. The future condition score is 5.0 (very poor). This renewal section covers previous reactive works sites.

Control Systems Renewal

Design and Procure scope has increased to inform the future renewals programs for Optic Fibre (with no renewals planned in FY27), Signalling Interlocking and points improvement, offset by a reduction in the requirement for Train Detection design in FY27.

Safe Working:

- Weighbridge at North Goonyella Balloon, Hot Bearing Detector / Hot Wheel Detector at Wotonga and Wheel Impact Load Detector at Wandoo, all which had designs completed in prior years, with a future condition of 4.0 (very poor).
- Relay to Processor Based Interlocking at Wandoo, future condition rated as 4 (very poor). Interlocking controls field equipment and enforces the safe separation of trains.

- Replacement of the obsolete ML track circuits, future condition rated 5, to be replaced with modern equivalent axle counters at Ingsdon and Riverside. They are driving scope for the April 60 hr closure and May 60 hour closure respectively.

Transmission and Data Renewals:

- Routers, Switchers and firewalls, future condition rated 4 very poor, are key components of the Internet Protocol network that provides connectivity for devices including Train Control Systems, Traction Scada System and the TETRA Radio System.
- 16 Industrial Ethernet 3010 series switches that are no longer supported by Cisco allows the routing around single points of failure of underlying transmission infrastructure to maintain operations.
- Generators that provide back-up power supply to various control systems infrastructure with a future condition rating of 5 'failed'.
- The renewal of Digital Microwave Radio links at Kerlong and Sarina, with a future condition rating of 5 failed, that provide redundancy for optical fibre-based transmission or may be the sole communications pathway to some sites.
- 6 Transmission Power Supply renewals at Carborough Downs, Grosvenor, Hay point (2), Mackay (2) and 2 Generators at Coppabella & Sarina, with a future condition of 5 (failed).

Overhead Renewals

One major renewal will be completed for Feeder Wire Clearance Improvements at Balook in FY27 to address reliability issues due to inadequate clearance between the high voltage wires and the structures they are mounted on which allows wildlife to breach the gap contributing to 'trips' of the OHLE

Goonyella Ports OHLE renewal - component renewal of identified corroded assets will be renewed within integrated closures across FY27 and is driving scope for the April 60 hour closure. This scope also includes design work for future years.

Small Components - The asset comprises of many small part steelwork components which have a shorter service life compared to the overhead line structures and conductors. These components are renewed through the small component program with modern equivalent components. Two locations (Jilalan & Praguelands) will be renewed in FY27. The FY27 sites are future condition rated 5 (failed).

Termination Portals - 14 Termination Portal renewals with future condition rating 4 (very poor) due to accelerated corrosion will complete the program to renew termination portals at mine loadouts at German Creek, Hail Creek, Macarthur, Millenium Mine, Moranbah North, North Goonyella and Oak Creek. Termination portals are used to terminate the overhead line on each side of train loadouts.

At Peak Downs, six headspans will be replaced with light portal arrangements. These sites are future condition rated as 3 (poor) due to leaning of masts resulting from movement of foundations in black soil environments. The resultant sagging of cross-span wires has caused the contact wire supports on all tracks to deviate from their design height, stagger, and offset. Headspans are driving scope for the April 60 our closure.

Power Systems

Two sites at Yukan for Motorised Isolators (MI) renewals form the basis for driving scope in the February 36 hour closure. They each have a future condition rating of 4.1 (very poor). Motorised Isolators enable portions of the OHLE to be electrically switched in or out (isolated). They are used during planned or emergency work to enable isolation of the OHLE for work to be undertaken.

Renewal of 3 auto transformers at German Creek and Villafranca. The two autotransformers at German Creek, with future condition rating 5.0 (very poor), form the basis for driving scope in the November 60 hour closure. Additionally, the FY27 program includes the completion of the feasibility stage of the Traction Substation Renewals project and the procurement of long lead items.

Table 28 provides a summary of Goonyella System renewals as a proportion of total system assets, as well as the condition and criticality of the sites selected.

Table 28 FY27 Renewals Strategy - Goonyella System

Renewal Item	FY27 Proposed Scope	FY27 No. of Sites	Avg Future Condition of Sites Selected	Avg Criticality of Sites Selected	Total System Assets	FY27 Scope % Total System Assets	Cost (\$m)
Civil Assets							108.0
Permanent Way							39.2
Rail Renewal (rail Km)	20.3	9	3.5	3.6	2,032	1.0	10.4
Sleeper Renewal (sleepers)	657	1	3.5	2.7	1,016	0.04	0.3
Track Upgrade (Track km)	10.3	3	3.8	2.6	1,016	1.0	13.9
Permanent Way – Other			5.0				1.9
Turnout Renewals	4	2	3.9	4.3	399	1.0	8.5
Turnout Components			5.0				4.1
Turnouts Designs	2	1	4.0	5.0			0.1
Ballast Cleaning							40.7
Mainline Undercutting (track km)	42.2	16	3.9	3.8	1,016	4.6	30.9
Mainline Excavator Undercutting (track km)	4.4	5	4.0	4.0			4.0
Turnout Undercutting (site)	19	7	4.2	4.2	399	4.8	3.8
Monumenting (site)			5.0				1.2
Ground Penetrating Radar			5.0				0.8
Structures							9.3
Bridges (Component) Renewal (site)	1	1	3.5	4.8	103	1.0	0.2
Culvert Design (site)	23	20	4.2	4.0			0.9
Culvert Renewals (site)	10	8	4.3	4.2	1,169	0.9	8.2
Civil Renewals							18.8
Level Crossing Renewals (site)	2	2	4.0	4.0	277	0.7	2.2
Level Crossing Design (site)	7	5	4.0	5.0			0.8
Level Crossing Other	1	1	5.0	5.0			1.5

Renewal Item	FY27 Proposed Scope	FY27 No. of Sites	Avg Future Condition of Sites Selected	Avg Criticality of Sites Selected	Total System Assets	FY27 Scope % Total System Assets	Cost (\$m)
Formation Renewals (track km)	1.7	2	4.8	4.3	1,016	0.2	7.6
Formation Reactive			5.0				3.5
Formation Other			5.0				0.1
Access Points (site)	5	4	5.0	5.0			0.6
Access Roads (site)			5.0				0.4
Corridor Security Fencing (km)	28.7	3	4.0	4.0	1,463	1.9	2.0
Control Systems Assets							20.6
Safe Working Systems – Asset Protection (site/unit)	3	3	4.0	4.8			3.1
Safe Working Systems – Interlockings (site/unit)	1	1	4.0	4.0			1.8
Safe Working Systems – Train Detection (site/unit)	33	3	4.3	4.0			5.5
Safe Working Systems – Minor (site/unit)	29	1	4.7	4.0			3.8
Telecommunication Asset (km)	60.3	4	4.0	4.0			0.3
Transmission & Data Renewals (site/unit)	32	26	4.6	4.0			3.6
UTC DTC (site/unit)	7	7	4.0	4.0			1.5
Cyber Security	-	1	5.0	5.0			0.6
Other Control Systems	1						0.3
Electrical Assets							19.8
Overhead Line Equipment Renewal (site/unit)	33	11	4.8	4.8			4.3
Power Systems Renewal (site/unit)	13	9	3.6	3.3			3.4
Goonyella Ports Overhead Renewals	45	7	5.0	5.0			6.3
Traction Substation Renewal (site/unit)	-	-	5.0	5.0			5.7
Total							148.4

Note: Figures may not add due to rounding.

FY27 Renewal Scope Variance Analysis – Goonyella System

Broadly, the variation in scope for each asset class compared to either the FY26 Budget or the indicative FY27 forecast included in the FY26 MRSB is due to the review of asset condition and criticality as part of selecting scope for the FY27 Final Draft Proposal.

Compared to FY27 Indicative Forecast in FY26 MRSB (decrease of \$5.4m):

Civil (\$1.2m increase) – Increase driven by an even mix between scope and cost decreases and increases. Scope increases relate to Permanent Way & Civil Renewals while the scope decreases relate to Ballast Cleaning & Structures.

Control Systems (\$3.1m decrease) – Predominantly due to a decrease in Safe Working Systems – Minor scope and Telecommunication Assets scope.

Electrical Systems (\$3.5m decrease) – Decrease is predominantly due to maturing of cost estimates of the Electric Traction Substation renewals and Goonyella Ports Overhead Renewals.

Compared to FY26 Budget (increase of \$15.1m):

Civil (\$0.4m increase) – Increase in Track Upgrade and Level Crossing scope is offset by a reduction in rail renewal scope and decreases in mainline ballast undercutting cost.

Control Systems (\$8.6m c.70% of increase) – Increase is reflective of the reduction in FY26 scope to provide stability in the delivery of the program year on year and predominantly due to an increase in Train Detection, Interlocking, Safe Working Systems – Asset Protection, Transmission & Data Renewals and Safe Working Systems – Minor (design).

Electrical (\$6.0m of c.30% of increase) – Increase is predominantly due to maturing of estimates for the Electric Traction Substation renewals and Goonyella Ports Overhead Renewals.

Table 29 is a summary of FY27 Goonyella System renewals compared to the FY26 Budget, at the program level.

Table 29 FY27 Renewals Budget - Goonyella System

Renewal Item	Assets Included	FY26 Approved Budget (\$m)	FY27 Proposed Budget (\$m)	FY26B v FY27B (\$m)
Civil Assets		107.6	108.0	0.4
Permanent Way	Rail, Track Upgrade, Sleepers, Turnouts	33.1	39.2	6.1
Ballast Cleaning	Mainline and Turnout Undercutting, Bridge Ballast, Monumenting and GPR	45.2	40.7	(4.6)
Structures	Bridges and Culverts	10.9	9.3	(1.7)
Civil Renewals	Level Crossings, Formation, Access Points, Slope Stability	18.3	18.8	0.5
Control Systems	Safe Working, Train Control and Detection, Interlocking, Telecoms, Power Resilience, Transmission	12.0	20.6	8.6
Electrical Assets	Overhead Line Equipment and Power Systems	13.8	19.8	6.0

Renewal Item	Assets Included	FY26 Approved Budget (\$m)	FY27 Proposed Budget (\$m)	FY26B v FY27B (\$m)
Total		133.3	148.4	15.1

Note: Figures may not add due to rounding.

Table 30 provides detail on the variance between the FY27 Final Draft Proposal and the FY26 Budget.

Table 30 Cost Driver Movement Summary – Goonyella System

RIG Category	FY26B v FY27B	Comment
Civil Assets	\$0.4m	
Permanent Way	\$6.1m	<p>Rail & Track Upgrade – Less pure rail renewal in FY27 with a slight increase on unit rate. This is offset by a larger Track Upgrade program that is resulting in a 11% decrease in unit rate per track km for Track Upgrade due to larger sites.</p> <p>Turnout Renewal – In FY27 two locations are having multiple turnouts replaced. 3 at Hatfield and 4 at Praguellands. Renewing multiple turnouts together adds project complexity and is time, access and resource-intensive, however attracts a lower per turnout cost than if they were delivered separately as efficiencies from shared resources can be achieved.</p>
Ballast	(\$4.6m)	<p>Mainline Undercutting – Similar program cost and scope in FY27 to FY26 with a 13% reduction in cost per km of undercutting. Achieved via an improved assumed return rate against the FY26 assumed rate.</p> <p>Turnout Undercutting – More scope in FY27 seeing 15 turnouts for undercutting up from 9 in FY26 (excluding reactive renewals). FY27 unit rate is 4% lower per turnout as program has planned to complete 9 of the 15 in a nest. A nest is where a series of adjacent turnouts are undercut in the same track possession opposed to each turnout being done individually. This increase utilisation of plant and reduces site specific costs.</p>
Structures	(\$1.7m)	<p>Culverts – More scope in FY27 but with a lower overall budget than FY26. The variation in program cost relates to the differing mix of renewal types between years. In FY27, 4 of the 10 sites are culvert linings that reset the condition of the asset but is less cost impacting as works can be completed under traffic. Additionally, the other removed and replace culverts are smaller sites. FY26 costs were driven by a large replacement at Waitara that saw 81 cells replaced in a 9 x 9 structure that supports under 3 tracks. Note 13 structures designs introduced into the FY27 program to support a larger renewal strategy in Yukan Yard in FY29-30.</p> <p>Culvert Estimate Assumptions – Network achieved program savings in FY25 and FY26 through procurement, where initial MRSB estimates proved conservative compared to vendor pricing. Consequently, the FY27 estimate reflects improved market tender savings over the FY26 tendered pricing.</p>
Civil Renewals	\$0.5m	<p>Formation Reactive – An additional \$1.1m has been allocated for reactive formation scope in FY27. This increase reflects the year-on-year increase of reactive formation sites in FY24 and FY25. Given its location below the track structure formation presents as a defect requiring reactive renewals to retain track capacity and operational safety.</p>
Control Systems	\$8.6m	<p>The FY26 program was reduced to stabilise the delivery of the program and to create space for the completion of design works to be delivered in future years. The program is larger in FY27 with regards to the scope to be completed.</p>

RIG Category	FY26B v FY27B	Comment
		<p>For renewals, design, procure and build variance, \$7m is due to scope increases and \$1.9m is due to cost changes.</p> <ul style="list-style-type: none"> • More scope and therefore cost in FY27 for Asset Protection (Weighbridge and HBD and WID installations equating to c. \$3.1m increase. • Increase in tetra radio cost of c. \$90K noting unit cost increases across one less site in FY27. • Commencement of the Jilalan Interlocking project and the completion of the Wandoo Interlocking in FY27, no interlocking works in FY26 equating to c. \$2.2m increase • Increase in relay to PBI renewal equating to c. \$2.4m increase. • Decrease in digital telemetry cost of c. \$80K due to reduction in unit cost.
Electrical Assets	\$6.0m	Feeder Station Renewals – Elevated costs in FY27 up \$4.8m as project will be completing Feasibility planning and early procurement activities ahead of the delivery commencing in FY28.

Renewals Opportunities and Risks – Goonyella System

Aurizon Network has identified risks and opportunities across each renewals category in the Goonyella system. It has then quantified the possible value impact of these risks or opportunities eventuating in the FY27 MRSB period and assigned an associated value range to the budget that should be considered as the opening forecast for the delivery of the identified scope.

On a weighted average of estimate class and program value, the FY27 renewals budget should be considered as a Class 3 estimate.

The upper and lower bounds of this value range are the extremes of all risks, or all opportunities realising in the MRSB period.

Table 31 Opportunity and Risk Range – Goonyella System

	\$m
FY27 Renewals Budget	\$148.4
Class of Estimate at Submission	Class 3: +/-10%
Resulting Value Range	+14.8 / -\$14.8
FY27 Upper and Lower Value Range	Upper \$163.2 / Lower \$133.6

Figure 30 indicates each program of works plotted to represent the value of the program in FY27 and the class of estimate representing the value range at the point of MRSB submission.

Estimate Class

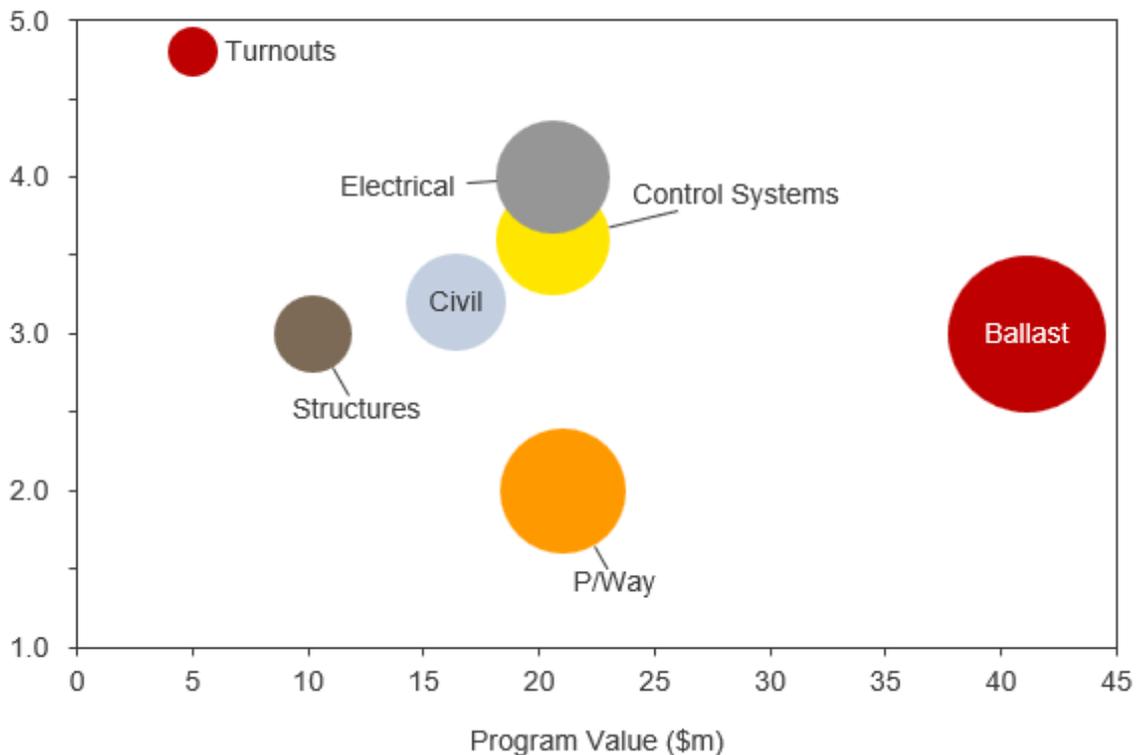


Figure 30 Program Value and Estimate Class – Goonyella System

Those programs that are typical Baseload scope attract a lower class of estimate that reflects the reduced level of expected delivery uncertainty. Those scope items that are Strategic in nature or at early stages of delivery planning, procurement or design at submission time attract a higher value range of estimate. Of note in FY27:

- The Feeder Station Renewals program within the Electrical program is at a Feasibility at MRSB submission and as such is considered a Class 4 estimate. The stage gate process is the process of maturing scope and estimate, this program will be at a Class 3 estimate at the completion of Feasibility in FY27.
- The Control Systems program is considered at Class 4. Given the heavy dependence on external vendors and that Aurizon competes in a global market for electrical components. The procurement elements of this program have a significant impact on the actual versus forecast project cost. Aurizon develop its estimate given either last known costs from prior years or estimated costs based on early vendor engagement. The procurement process for the program will be completed ahead of the FY27 period, the outcome of these processes will result in the estimate being better defined prior to FY27 delivery.
- The Ballast program is at Class 3. Actual return rate of ballast versus assumptions in estimate will be the main driver of variation (both positive and negative) in the year of delivery.
- The delivery approach for the complex four-turnout renewal at Praguelds has matured alongside the design since the initial MRSB submission. This has resulted in additional costs associated with signalling, earthworks and track materials. With efficiency in mind, overhead modifications originally planned for FY28 have been brought forward into FY27 program allowing teams to take advantage of the existing access. In addition, approximately 1.5km of security fencing being required to separate the site from a new subdivision. These items were not included in the original cost estimate.

- The delivery approach for the Track Upgrade and Rerail scope at Wandoo-Waitara, is still in development due to the complexity of accessing the site within an embankment/cutting.

4.3 Maintenance Budget – Goonyella System

Aurizon Network has developed its Final Draft Maintenance Strategy and Budget for the Goonyella System having regard to all relevant matters outlined in clause 7A.11 of UT5, including the Maintenance Objectives. Aurizon Network considers its FY27 Final Draft Proposal provides an appropriate level of asset activity that will promote the safety, reliability and performance of the Goonyella System rail Infrastructure and seeking to deliver Committed Capacity.

Summary of Historic, Forecast and FY27 Maintenance Strategy and Budget – Goonyella System

Aurizon Network’s FY27 Final Draft Proposal for the Goonyella System provides for a Direct Maintenance Cost Allowance of \$82.1m (excluding ballast undercutting plant depreciation) and assumes delivery of efficiencies identified in section 2.4 Improvements and Efficiencies. The budget is largely informed by escalation, fixed internal labour and indirect costs and historical activity levels, with General Track, Signalling & Telecoms and Rail Grinding activities representing ~61% of the system spend.

To maintain asset condition and reliability, a higher level of corrective maintenance activity is expected to support the General Track maintenance program including drainage and rail maintenance activities. The FY27 Final Draft Proposal is \$3.5m higher than the FY26 Budget.

Figure 31 and Figure 32 provide a summary of historic direct maintenance costs as well as the proposed direct maintenance cost allowance in respect of FY27.

To ensure comparability with prior periods, the direct maintenance costs shown in these figures exclude depreciation on ballast plant.

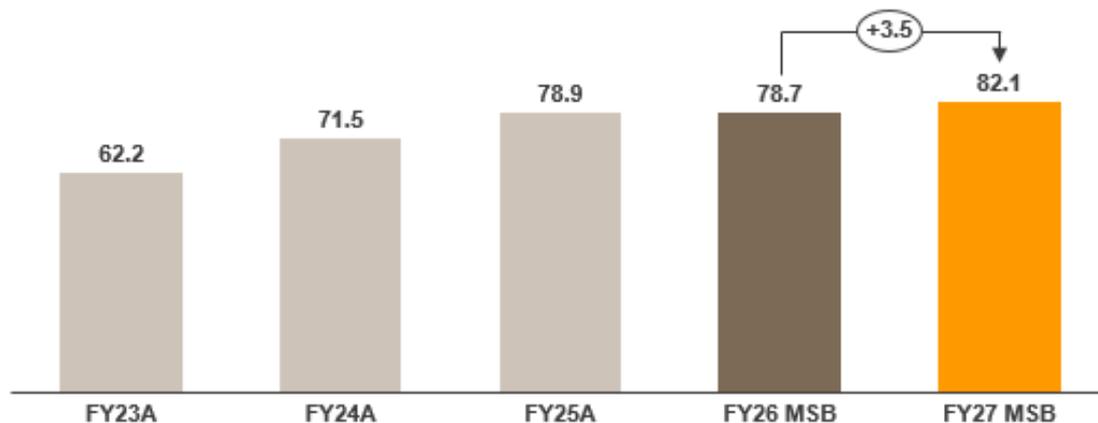


Figure 31 Historic Direct Maintenance Costs – Goonyella System

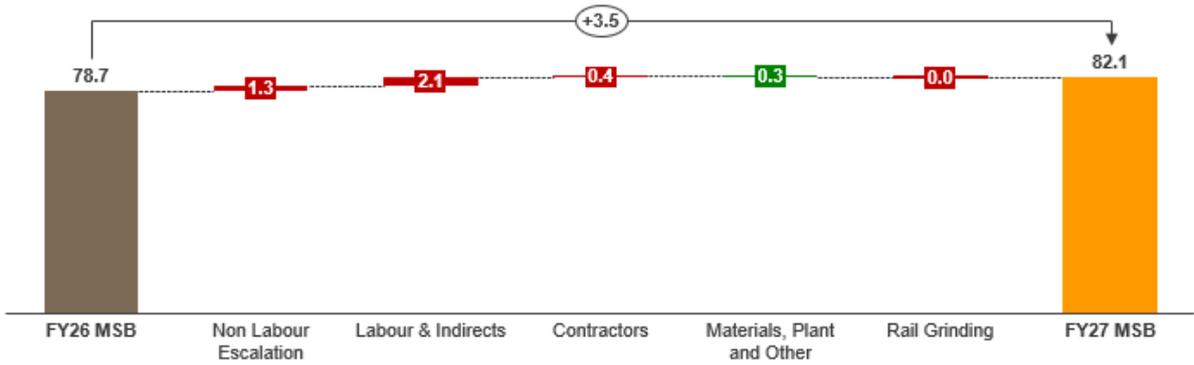


Figure 32 Cost Driver Movement Breakdown – Goonyella System

Table 32 describes the movement in maintenance spend against the prior approved budget, by cost category.

Table 32 Cost Driver Movement Summary – Goonyella System

Cost Category	Change	Comment
Non-Labour Escalation	\$1.3m	Increase driven by annual cost escalation on contractors, materials, plant, other consumables and rail grinding.
Labour and Indirect Costs	\$2.1m	<p>Labour and indirect cost included in the FY27 Final Draft Budget reflect the execution of the labour efficiency initiatives across all teams during FY26, to deliver on the target efficiencies overlaid in the FY26 Budget.</p> <p>Labour and Indirect costs increase against FY26 Budget is driven by:</p> <ul style="list-style-type: none"> Uplift in Electrical Overhead labour allocation \$0.7m, predominately driven by increased feeder station maintenance activity. Civil Infrastructure labour reflecting a \$0.6m increase driven by reprioritisation of internal labour resources to support increased rail maintenance activity levels. Increased On Call labour costs \$0.3m following the introduction of a night shift roster in Control Systems North, to maintain delivery of planned maintenance activities, which can be impacted by overnight on call response to incidents as both activities draw from the same resource pool. Higher Track Resurfacing labour costs of \$0.2m despite reduced scope, which reflects an increased allocation of the Resurfacing team’s labour due to lower plant maintenance activities. <p>Movements isolated above include annual increases required under the Infrastructure Enterprise Agreement and other Staff Agreements.</p>
Contractors	\$0.4m	<p>Contractor cost increase against FY26 Budget is driven by:</p> <ul style="list-style-type: none"> Increase in General Track (GT) maintenance \$0.4m largely driven by additional contractor costs \$0.5m to support rail maintenance activity levels, this has been offset by a reduction of (\$0.1m) driven by the internalisation of vegetation management. Contract costs in GT also includes support to deliver the targeted drainage program which includes 8 sites, all with very poor drainage condition. Minor increases to Electrical Overhead category driven by increased feeder station maintenance. Minor uplift in Trackside System category, largely driven by increased maintenance activity in FY25, increasing the historical average used to inform FY27 activity levels.

Cost Category	Change	Comment
Material and Plant Usage	(\$0.3m)	<p>Material and Plant Usage decrease against FY26 Budget is driven by:</p> <ul style="list-style-type: none"> Lower Track Resurfacing materials and plant usage (\$0.7m) which reflects reduced maintenance consumables and a lower allocation of Resurfacing team labour due to reduced plant maintenance activities. Electrical reflects (\$0.3m) reduction in Material & Plant costs driven by internal plant allocation and updated run rates. <p>Offset by:</p> <ul style="list-style-type: none"> An increase in General Track maintenance \$0.4m largely driven by rail materials \$0.3m required to support corrective rail maintenance activity levels \$0.3m. Further impacted \$0.1m by internal plant to support ballast maintenance requirements.
Rail Grinding	\$0.0m	Scope in line with prior year.
Total	\$3.8m	

Note: Figures may not add due to rounding.

The proposed FY27 maintenance scope and budget for the Goonyella System is outlined in Table 33.

Table 33 FY27 Maintenance – Goonyella System

Maintenance Item	Scope Units	FY26 Budget Scope	FY26 Budget (\$m)	FY27 Budget Scope	FY27 Budget (\$m)	Variance (\$m)
Resurfacing			10.4		10.2	(0.1)
Mainline	Km	956	8.5	860	8.2	(0.3)
Turnout	Site	189	1.9	189	2.0	0.2
Rail Grinding			12.0		12.3	0.2
Mainline	Km	<i>Redacted</i>	9.4	<i>Redacted</i>	9.3	(0.1)
Turnout	Site	<i>Redacted</i>	2.5	<i>Redacted</i>	2.8	0.3
Level Crossing	Track LX	<i>Redacted</i>	0.1	<i>Redacted</i>	0.1	(0.0)
General Track Maintenance			20.7		22.4	1.7
General Track	Activity		15.7		17.5	1.8
Corridor Maintenance	Activity		4.3		4.3	(0.0)
Ultrasonic Testing	Km	5,042	0.7	5,222	0.7	(0.0)
Signalling and Telecoms			15.0		15.2	0.3
Electrical			10.0		10.4	0.4
Structures and Facilities			3.1		3.1	0.0
Trackside Systems			1.8		2.2	0.4
Other Civil Maintenance			3.6		3.7	0.0
Other General Maintenance			2.2		2.6	0.5
Sub-Total			78.7		82.1	3.5
Ballast Undercutting Plant Depreciation			2.3		2.6	0.3
Total Direct Maintenance Costs			81.0		84.7	3.8

Maintenance Item	Scope Units	FY26 Budget Scope	FY26 Budget (\$m)	FY27 Budget Scope	FY27 Budget (\$m)	Variance (\$m)
Non-Coal Allocation			(0.1)		0.0	0.1
Total			80.9		84.7	3.8

Note: Figures may not add due to rounding.

Material movements in spend by maintenance category against the prior approved budget are also outlined in Table 34.

Table 34 Cost Movements by RIG Category – Goonyella System

RIG Category	FY26B v FY27V	Comment
Resurfacing	(\$0.1m)	Reduction against the FY26 Budget reflects a reduced scope, with system-specific requirements now informed by ATIS data. Increased labour allocations have been offset by lower resurfacing plant costs and reduced plant maintenance labour.
Rail Grinding	\$0.2m	Additional turnout scope offsetting reduction in mainline scope due to cycle variations.
General Track Maintenance	\$1.7m	<p>Increase compared to FY26 Budget driven by the following changes:</p> <ul style="list-style-type: none"> Additional internal labour support, contractor support and rail materials required to support corrective rail maintenance activity levels. Increase in external contractor spend because of the transition to aerially deployed granular herbicide to support vegetation management, partially offset by the internalisation of specific vegetation management activities in the Moranbah Civil district. Program also includes contractor costs to execute 8 targeted corridor drainage sites, with very poor drainage condition. <p>Please refer to Drivers of Change in Maintenance Budgeting Approach – General Track in Appendix 6 – Works End to End Process for additional information on budget assumptions for rail maintenance, targeted drainage and vegetation management activities.</p>
Signalling and Telecommunications	\$0.3m	Minor increase in FY27 Final Draft Budget, largely driven by labour and material cost escalation. This has been partially offset by variation in system and category mix allocations, with additional support required across Newlands and Moura systems in FY27 compared to FY26 Budget assumptions.
Electrical	\$0.4m	Increase in FY27 Final Draft Budget is largely driven by cost escalation and labour due to an uplift in feeder station maintenance activities. This has been partially offset by a reduction in materials & plant usage.
Trackside Systems	\$0.4m	Increase in FY27 Final Draft Budget is driven by an uplift in maintenance activity, largely driven by the increased corrective maintenance in FY25. This has resulted in an increase in labour allocation (offset by a reduction in Signalling & Telecoms category as mentioned above), with work performed across both categories by the same internal labour resources.
Other Civil Maintenance	\$0.0m	Minor uplift driven by cost escalation.
Other General Maintenance	\$0.4m	Uplift in labour cost allocation driven by changes to rostering arrangements within the Control Systems North team following the introduction of a night shift roster, to maintain delivery of planned maintenance activities, which can be impacted by overnight on call response to incidents as both activities draw from the same resource pool.

RIG Category	FY26B v FY27V	Comment
Ballast Plant Depreciation	\$0.3m	Ballast undercutting plant depreciation in total is slightly higher than the FY26B, with the allocation between systems based on the number of days that the ballast plant is expected to be operating in the Goonyella system in FY27.

For additional information on the budgeting approach and assumptions, please refer to Budget Setting and Procurement section in Appendix 6 – Works End to End Process.

Figure 33 sets out a summary of historic and budgeted direct maintenance costs by maintenance category. To ensure comparability between periods, the direct maintenance costs presented, exclude depreciation on ballast undercutting plant.

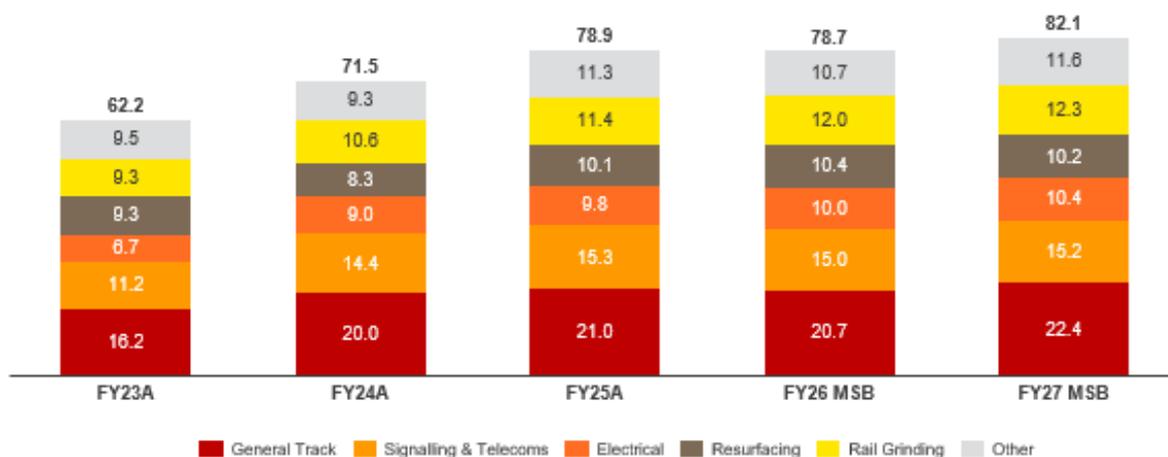


Figure 33 Direct Maintenance Costs by Category – Goonyella System

Figure 34 sets out a summary of historic and budgeted direct maintenance costs by activity type.

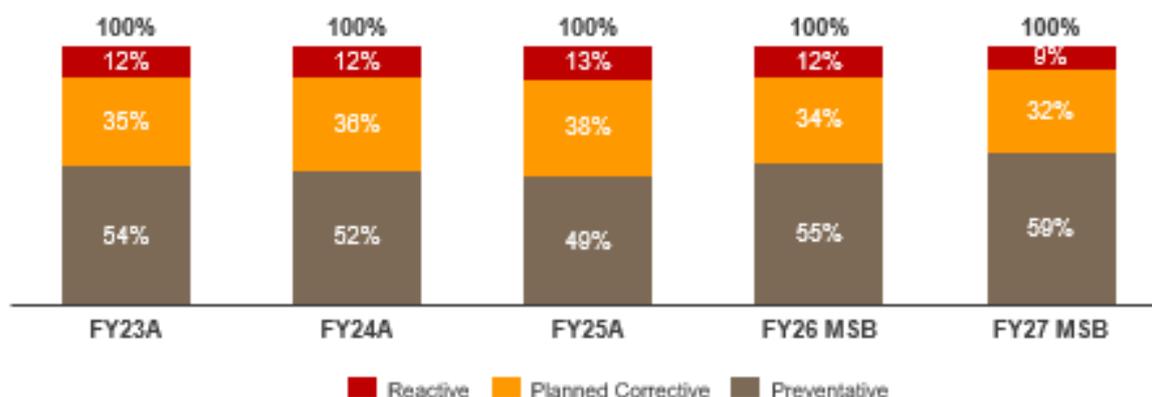


Figure 34 Direct Maintenance Costs by Activity Type – Goonyella System

4.4 Integrated Closure Plan – Goonyella System

Aurizon Network has developed an access plan to deliver the required scope for the Goonyella System while balancing cost and access.

FY27 will see reduced integrated closure hours, offset by increased single-line activities (420 Integrated Closure hours and 1309 single-line hours).

Table 35 summarises Aurizon Network’s approach, incorporating customer and supply chain feedback received through development of the FY27 MRSB.

Table 35 FY27 Supply Chain Considerations – Goonyella System

Opportunity	Details
Optimising for Throughput	<ul style="list-style-type: none"> • Integrated closures not planned in July 2026 and June 2027 to help maximise throughput. • Closures loaded to resource and safe work integration capacity, with single line transitions used where possible to reduce total integrated closure durations (e.g. height limited machinery). • High impact scope prioritised for closures to minimise single line impact including high impact BCM Scope locations. • Single line OHLE maintenance where possible (branchline only). • Aligned single line scope between disciplines where possible (e.g. RM902 plus bridge rollout, OHLE maintenance plus rerail). • Keeping Q4 light of single line works in Goonyella.
Supply Chain Alignment	<ul style="list-style-type: none"> • Alignment with terminal maintenance schedules. • Cross system closures – worked to reduce impact while completing required scope (GA branch stops at Lake Vermont with exception of 60hrs in Nov, packed with scope). • Aligned with Queensland Rail closures on the North Coast Line (NCL) to reduce cumulative impacts (involving changed team roster pattern).
Closure Timing	<ul style="list-style-type: none"> • Closures planned to avoid public holidays, weekends (where practical). • Maintained one major closure to a single roster block to maximise internal resources. • Considerations for regional events and significant sporting events to assist accommodation availability for crews • Higher ramp up of resurfacing machines within closures, allowing more work to be planned.
Program Staging	<ul style="list-style-type: none"> • Avoiding high risk scope in the wet season where possible. • Turnout undercutting packaged at stations for efficiency and to reset to design.
Integrated Closure Summary	<ul style="list-style-type: none"> • 5 main trunk closures planned for FY27. • Includes 2 branch line closures. • YoY reduction in the number of closures taken and overall closure hours. • Reduced Integrated Closure hours and frequency offset by increased single line activity with lower impact • Overall improvement in network capacity available for revenue traffic through maximising the packaging or renewals and correct maintenance activity within available closure windows. • Reduction in overall Integrated Closure hours. • Minimise impacts to cross-system traffic through closure footprint reduction and staged handback of footprint where possible.

Table 36 Planned Integrated Closures and Branch Closures – Goonyella System

FY27 Integrated System Closures													
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
Location		Ports WOT GAPE 72hrs		Ports COP	LVM BUR	Ports COP		Ports COP		Ports WOT LVM	COP NGA BA		
Hours	0	108	0	60	60	36	0	36	0	60	60	0	420

Table 37 Driving Path Scope – Goonyella System

Closure	Driving Path Activities	Location
August 108-hour	Turnout Renewal RM902 Ballast Renewal Excavator Undercut Turnouts Track Upgrade and Rerail Overhead Renewals Formation and Sleepers Formation	Praguelands Yukan – Hatfield Jilalan Wandoo – Waitara Dalrymple Bay Broadlea Winchester
October 60-hour	Excavator Undercut Turnouts RM902 Ballast Renewal Level Crossing Track Upgrade Overhead Renewals Turnout Renewals	Braeside Bolingbroke - Balook Hay Point Wandoo – Waitara Dalrymple Bay Hatfield
November 60-hour	Power Systems Renewals Level Crossing Renewal	German Creek Norwich Park
December 36-hour	RM902 Ballast Renewal Excavator Undercut Mainline Overhead Renewals Rerail Power System Renewal	Waitara – Braeside Yukan – Black Mountain Hay Point Jilalan – Yukan Yukan
February 36-hour	RM902 Ballast Renewal Excavator Undercut Turnouts Rerail	Jilalan - Yukan Waitara – Mindi Black Mountain – Hatfield
April 60-hour	Headspan Renewal Overhead Renewals Train Detection Rerail Turnout Renewal Track Upgrade Culvert RM902 Ballast Renewal	Peak Downs Hay Point Ingsdon Yukan – Black Mountain Hatfield Wandoo - Waitara Yukan Winchester – Peak Downs

Closure	Driving Path Activities	Location
	Excavator Undercut Turnouts	Yukan
	Excavator Undercut Mainline	Winchester – Peak Downs
	Overhead Upgrades	Praguelands
	Formation	Winchester
May	RM902 Ballast Renewal	Wotonga – Moranbah North
60-hour	Train Detection	Riverside

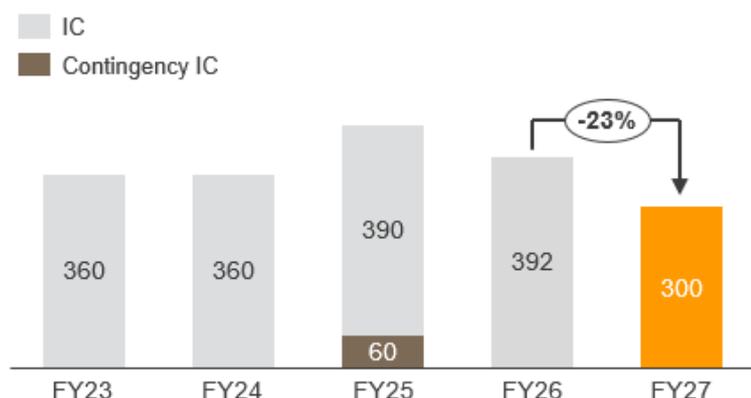


Figure 35 Trend of Integrated System Closure Hours (Mainline Only) FY23-FY27 – Goonyella System

4.5 Four-Year Forecasts – Goonyella System

This section outlines Aurizon Network’s indicative cost forecasts for Maintenance and Asset Renewal activity in each Coal System. Information is provided for this FY27 Final Draft Proposal plus a forecast period of four years (FY28 – FY31).

The FY28 – FY31 indicative cost forecasts are provided to increase transparency on forward looking asset renewals and maintenance expenditure. It is a high-level estimate based on currently available information. The outer year forecasts are predominantly based on the age of the asset and the strategic annual scope target to manage known future resourcing and access constraints where a significant number of assets are forecast to require renewal in similar periods (referred to as the ‘bow wave’ of required investment). For this reason, in a number of circumstances the number of renewals have been identified in each system and the specific site will be identified as further information about asset condition, viability of alternate multi-year asset management approaches, engineering designs, the access footprint and resourcing available to deliver the renewals become available.

Each future forecast will consider the re-phasing of scope from year to year where scope has been deferred into future years or future scope has been brought forward.

Table 38 FY27 Plus Four-Year Maintenance Cost Forecast (Nominal \$m) – Goonyella System

System Maintenance	FY27	FY28	FY29	FY30	FY31
Resurfacing	10.2	10.5	10.8	11.1	11.4
Rail Grinding	12.3	12.5	13.6	13.1	13.6
General Track Maintenance	22.4	23.1	23.9	24.6	25.4
Structures and Facilities Maintenance	3.1	2.1	2.2	3.4	3.5

System Maintenance	FY27	FY28	FY29	FY30	FY31
Other Civil Maintenance	3.7	3.8	3.9	4.0	4.1
Signalling and Telecommunications Maintenance	15.2	15.7	16.2	16.7	17.2
Electrical Overhead	10.4	10.7	11.0	11.4	11.7
Trackside Systems Maintenance	2.2	2.3	2.4	2.4	2.5
Other General Maintenance	2.6	2.7	2.8	2.9	3.0
Total Direct Maintenance Costs (excl. Ballast Undercutting Plant Depreciation)	82.1	83.3	86.8	89.6	92.6
Ballast Undercutting Plant Depreciation	2.6	2.6	2.6	2.6	2.6
Total Direct Maintenance Costs	84.7	85.9	89.4	92.3	95.2

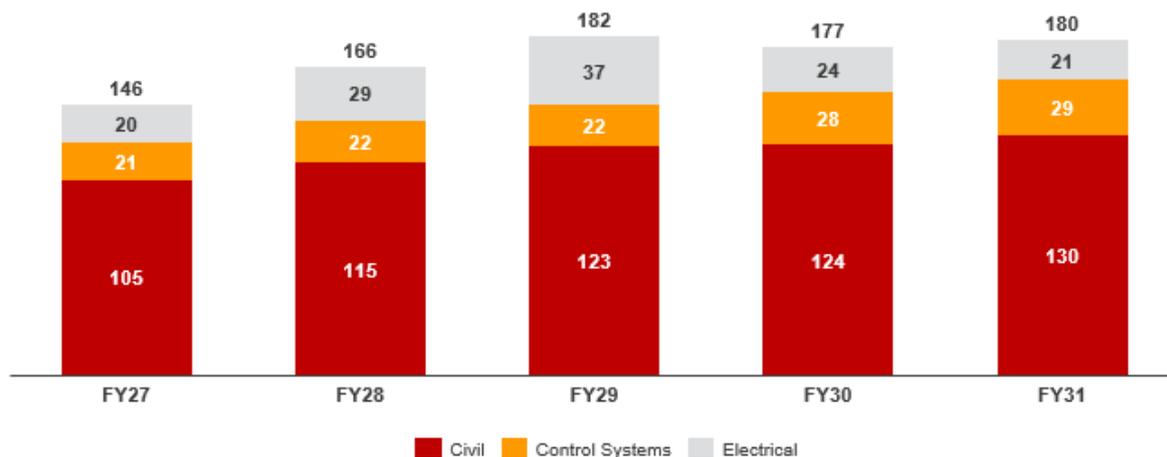
Notes:

- 3.2% escalation has been included for FY28 onwards.
- Rail Grinding forecast includes cost escalation and scope variation year on year driven by anticipated grinding requirements and stable management of rail asset condition. Future estimates are indicative only and may be subject to change and will be iterated in future MRSB submissions for RIG review and approval.
- General Track Maintenance forecast reflects a continued level of rail maintenance activity and targeted drainage works.

Table 39 FY27 Plus Four-Year Renewals Cost Forecast (Nominal \$m) – Goonyella System

Renewals Item	Asset Included	FY27	FY28	FY29	FY30	FY31
Civil Assets		105.3	114.9	123.2	124.2	129.6
Permanent Way	Rail, Track, Sleeper, Turnouts	36.4	35.1	43.4	42.2	44.1
Ballast Cleaning	Mainline and Turnout Undercutting, Bridge Ballast	40.7	46.6	48.6	50.4	52.6
Structures	Culverts, Bridges	9.3	11.3	10.1	12.3	12.8
Civil Renewals	Formation, Level Crossings, Access Points	18.8	21.9	21.1	19.3	20.1
Control Systems	Safe Working, Train Control and Detection, Interlocking, Telecoms, Power Resilience, Transmission, Optical Fibre	20.6	22.3	22.5	28.1	29.4
Electrical Assets	Overhead Renewal, Power Systems, Traction Substation Renewal	19.8	29.1	36.7	24.5	21.4
Total		145.6	166.3	182.4	176.8	180.4

Note: 4.4% escalation has been included.



Note: Four-year forecast is indicative only and does not account for access, resource considerations, detailed design and associated costings.

Figure 36 FY27 Plus Four-Year Renewals Cost by Scope Category (Nominal \$m) – Goonyella System

Four-Year Forecast Commentary – Goonyella System

Civil

The Ballast Cleaning program is 40% of the Civil program across the four-year forecast period. It includes on average 52km of ballast undercutting and 21 turnouts.

The renewal of Permanent Way assets is approximately 30% of the civil program and includes an average of 1850 sleepers, 28 rail km, 6 track km (both sleepers and rail) and up to 4 turnouts per year.

Structures include the renewal of an average of 12 culverts and up to 4 bridges per year.

The majority of costs in the civil renewal program are attributable to 2.2km of Formation, Level crossings of between 2 and 4 each year (including for cattle crossing infrastructure and active protection upgrades) and the access points and roads.

Control Systems

Safe Working Systems – Interlockings, Transmission and Data Renewals, Safe Working Systems – Train Detection represent approximately 65% of the Control Systems four-year forecast.

Safe Working Systems – Interlockings to replace life expired assets.

Renewals for Transmission and Data predominantly include Tetra radio, digital microwave radio, routers, switches and firewalls, equipment rooms and power supply.

Safe Working Systems – Train Detection is the replacement of older analogue track circuit assets with modern equivalent axle counters.

Electrical

Traction Substation Renewals are approximately 80% of the Electrical 4 year forecast in Blackwater. Estimates have progressed from concept estimates to pre-feasibility and are at a higher level of accuracy (Class 4). The estimates will be updated at the conclusion of the ‘feasibility’ stage of the project in Q2 FY27. Autotransformer Renewals represent 10% of the four-year forecast.

5 Moura System

Moura System Summary	
Moura Asset Management Strategy	Recognises the lower tonnage profile which facilitates a greater reliance on corrective maintenance than renewals and results in a higher maintenance to capital ratio than other systems.
Guidance for Decision Priorities	<p>In determining the trade-off decisions for the renewal programs, the following prioritisation has been considered, after discussion with the Rail Industry Group:</p> <ol style="list-style-type: none"> 1. Cost 2. Scope 3. Access <p>Prioritisation is based on assumptions that demand is strong, with available capacity and infrastructure reliability improving and performance is steady.</p>
Renewals Budget	<p>Asset Renewals of \$23.0m to renew between 0.1% and 3.2% of system assets with an average condition 4.53 (very poor) and assumes delivery of targeted efficiencies identified in FY26.</p> <p>Compared to the indicative forecast for FY27 included in the FY26 MRSB, FY27 renewals have increased by \$0.6m.</p> <p>Compared to the FY26 Budget, FY27 renewals have decreased by \$6.6m due to a reduction in rail renewal scope, Turnout renewal cost, mainline undercutting costs and Level Crossing renewal scope.</p>
Maintenance Budget	<p>Direct Maintenance Cost Allowance of \$20.0m (excluding ballast undercutting plant depreciation) and assumes delivery of targeted efficiencies identified during FY26. General Track maintenance, Signalling & Telecoms and Resurfacing activities represent 76% of the system spend.</p> <p>To maintain asset condition and reliability, the targeted drainage program will commence in FY27, together with a higher level of corrective maintenance activity to support rail maintenance, vegetation and maintenance ballast requirements. The FY27 Final Draft Budget is \$2.0m higher than the FY26 Budget.</p>
Integrated Closures and Capacity Impact	<p>System has sufficient capacity to meet Committed Capacity and includes:</p> <ul style="list-style-type: none"> • Increase in total mainline closure hours by 33% compared to FY26, with 4 planned Integrated Closures. • Three of the four closures coincide with Blackwater system closures to enable Callemondah Interlocking project commissioning.
Opportunity and Risks	At +/- 10% estimate. Renewals upper and lower value range is \$25.4m and \$20.8m.

5.1 Asset Management Strategy – Moura System

The asset management strategy for the Moura System recognises the lower tonnage profile which facilitates a greater reliance on corrective maintenance than renewals and results in a higher maintenance to capital ratio than other systems. This strategy can mean lower operational performance including unplanned outages in conjunction with longer periods of temporary speed restrictions than other systems.

The Moura System is the smallest of the Coal Systems in terms of both tonnage and distance. The Moura System services coal mines in the Moura region and Callide Basin, with coal being hauled to Gladstone for use at domestic industrial plants, Gladstone Power Station or for export via RG Tanna coal export terminal. The system is not electrified. However, the 7km section near Gladstone which forms part of the Blackwater System electric asset base provides an alternate path from Gladstone back to Callemondah.

In January 2025, demand for FY27 was estimated to be strong. However, in context of the ACAR 2024 where available capacity was improving and asset performance trends were steady, cost has been prioritised over scope and access with respect to trade-off decisions when performing work. The following is an example of this decision making for the Moura System:

- Two smaller sites for sleeper renewal were identified at Earlsfield replacing derailment damaged sleepers that are future condition rated 3.8. The amount of scope proposed to be completed in the closure created a higher risk that not all scope would be completed. This scope was proposed to be completed by the track laying machine to reduce costs in delivery. However, as the renewals were smaller in size it was identified that there were limited cost benefits compared to executing with an excavator. Additionally, while part of the 3km multi-year TSR that is in place in Moura due to these derailment damaged sleepers, the small size, c.230m, would not materially reduce the TSR. Therefore, due to the potential risk of not completing all other scope in the closure and the limited cost and reliability benefits of this specific scope (in isolation) it was decided to defer the scope to a future year.

Asset Renewal Strategy – Moura System

The Moura System is a purpose-built Coal System established in the 1960s and upgraded in the mid to late 90s and further loops extensions in the 2000s to manage the coal demands. There is a mix of asset conditions given age and use.

Table 40 Asset Profile – Moura System

Renewal Item	Comment
Civil Assets	The Moura System was constructed in the 1960's as a purpose-built coal line. However, the assets installed did not consider the axle loads nor train sizes now being operated in the system. The Moura system also has unique geographical characteristics including challenging access to the corridor and track alignment that provides for tight radius curves and steep grades, in particular at Mt Rainbow. The Moura System traverses extended sections of black soil leading to formation and track geometry defects when the soil conditions alternate between periods of extended wet and very dry. Mt Rainbow can be characterised as a large range crossing, comprising tight radius curves, steep grades, several original corrugated metal pipe culverts inside large embankments and generally flat terrain (resulting in poor drainage) west of Mt Rainbow. The lower volumes on the Moura System mean that the time between tonnage-based inspection and interventions is longer than in higher-volume systems.
Control System Assets	Processor based interlockings installed in the Moura System in the 1990's are nearing the end of their design life, with two of these interlockings identified for design works in FY25 and one site planned to be renewed in FY26. Trains are detected through a mix of track circuits and axle counter track sections with ongoing renewals programmed for life expired axle counter assets in future years. There is no optic fibre

Renewal Item	Comment
	<p>linkage in the Moura System, with telecommunications carried by the microwave radio systems. As a result, multiple failures of microwave links can result in lost communications. A single link failure is not generally an issue. The radio system across Moura was upgraded in recent years to a digital based Terrestrial Trunked Radio (TETRA) system.</p> <p>To mitigate against cyber security threats, a Network Cyber Security Project has been established to deliver an industry aligned model that provides separate security zones for Information and Operational technology systems. The transition of OT Systems to the segregated environment requires the migration of 24 discrete systems structured into three stages to improve delivery efficiency, cost control and interface risk management. Stage 1 focuses on the migration of high priority mission critical systems (7 of the 24 systems, representing 29%). This approach reduces operational and cyber exposure as quickly as possible while establishing repeatable migration patterns that will inform more accurate cost and schedule estimates for subsequent stages. Accordingly, the FY27 budget only provides for delivery of Stage 1, with additional customer engagement to finalise the approach for Stages 2 and 3 planned in FY26 and FY27.</p>

Asset Maintenance Strategy – Moura System

Maintenance activity is focused on inspecting and maintaining the in-situ condition of assets, repairing or implementing and maintaining minor holding works (including Temporary Speed Restrictions) following identification of a defect or infrastructure failure to minimise the impact and duration of unplanned outages.

The planned and preventive maintenance activities and inspections, including the planned mechanised production scope, as per the requirements of Aurizon Network’s Asset Maintenance and Renewal Policy and associated standards. The inspection regime and frequency are based on asset type, condition and location with defined intervention frequency levels. These can include:

- Usage-based - Example: track resurfacing is required every 50 million gross tonnes.
- Time-based - Example: turnouts requiring weekly visual inspections and a detailed annual inspection.
- Age-based - Example: 22.5 tonne axle load concrete sleepers being replaced every 40 years.
- Fix on failure.

The scope of planned corrective and reactive maintenance tasks is heavily dependent on the faults identified via the planned inspection programs. The Moura System is subject to asset inspection and intervention requirements consistent with the three other Coal Systems, however, the lower tonnage profile means Moura System can achieve the required throughput with more reliance on corrective maintenance and reactive renewals and longer periods of temporary speed restrictions than other systems.

Aurizon Network has assumed that in FY27 the Moura System will see a similar level of faults that require planned corrective or immediate response as in prior years using the 3-year average and adjusted for known or anticipated risks.

Table 41 summarises the assumptions for the Moura System for material maintenance items where the scope assumptions are different to the 3-year average.

Table 41 Asset Maintenance Profile – Moura System

Maintenance Item	Comment
Resurfacing	<p>12% of maintenance budget.</p> <p>Track resurfacing restores the health of the track and ballast assets. It can be both condition or tonnage-based intervention and can be both preventive and corrective.</p> <p>Preventative resurfacing scope is developed using track geometry data captured with ATIS together with historical failures and weather factors.</p> <p>Maintenance Ballast plus resurfacing assist to maintain the track geometry of the Moura System.</p>

Rail Grinding	<p>6% of maintenance budget.</p> <p>Preventative grinding strategy with small amount of corrective allowance to reduce rail breaks and extend the life of rail. Tonnage based intervention translated to time-based frequency to allow long term planning. Due to the tonnages, quantity of rail grinding will fluctuate yearly.</p>
---------------	--

General Track	<p>49% of maintenance budget.</p> <p>Replace rail, turnout maintenance and GIJ and welds represent 20% of costs</p> <p>Due to the higher maintenance to renewal Ratio, Moura General Track Maintenance consumes a high percentage of budget.</p> <p>Rail maintenance is expected to be higher than the 3-year average. Inspections and incidents have seen higher number of rail defects and corrective work activity throughout FY25, predominantly replacing rail due to older, life expired fatigued rail. In FY25, the number of rail repairs was 47% higher than the average number of rail repairs from FY23 to FY25, and the number of defects identified by non-destructive testing (ultrasonic) tripled in FY25 compared to the prior three years (19 compared to 4).</p> <p>Vegetation management supports safety through line of sight and egress to the corridor for train crew, maintenance workers and public at level crossings. Additionally, good vegetation management helps prevent electrical faults related to trees and branches falling on overhead line equipment.</p> <p>The Targeted Drainage Program is a strategic initiative designed to address compromised longitudinal drainage adjacent to track infrastructure. This typically occurs within cuttings and embankments where natural erosion, compounded by wet weather, leads to siltation and blockage of drains. It is a 5-year program in addition to the localised drainage maintenance that focuses on sites of less than 100 metres with identified defects to be repaired in that year.</p> <p>At the completed targeted drainage sites, a steady ongoing drainage maintenance program as part of localised drainage maintenance in the General Track Maintenance category is planned to maintain drainage paths and minimise natural erosion and siltation levels. The following sites are included for FY27.</p>
---------------	---

Section	Drainage Asset Condition Rating	Drainage Asset Condition Definition	Nominated Priority
Dumgree – Mt. Rainbow	4.0	Very Poor	Required
Annadale – Earlsfield	4.0	Very Poor	Highly Recommend
Graham – Stirrat	4.0	Very Poor	Highly Recommend

Note:
Required: Have been assessed as having a very poor condition, compared to all sites in the CQCN have a higher performance impact, higher number of formation failures and a lower \$/t capacity benefit.

Maintenance Item

Comment

Very Highly Recommended: Have been assessed as having at least 3 of the 4 benefits of 'Required'.

Highly Recommended: Poor to very poor condition, with either high history or potential performance impact or high number of formation failures historically.

Recommended: Very poor condition with lower historical or potential performance impacts and lower number of formation failures.

Further information on the drivers of change in General Track maintenance can be referenced in Drivers of Change in Maintenance Budgeting Approach – General Track in Appendix 6 – Works End to End Process.

Performance Trends – Moura System

The trend of 4- year averages for cancellations, delays and incidents provide an indication of the performance impact to customers of the asset management strategy over the short and medium term and is one factor in determining asset renewal scope.

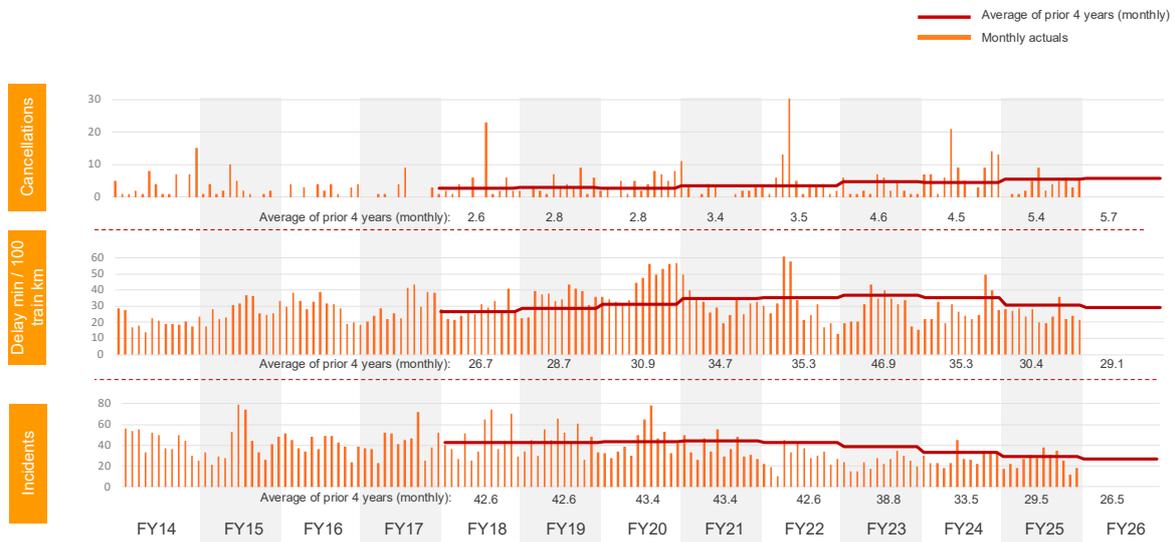


Figure 37 4-Year Average Performance Trends – Moura System

In Moura, cancellations and delays have deteriorated while the number of incidents has reduced over time. . The significance of the derailment at Mt Rainbow in FY22 and the nature of the lagging 4-year average calculation has resulted in the 4-year average for cancellations from FY23 to FY26 is being elevated. The 4-year average for FY27 will not be exposed to any impact from FY22 and will consequently reduce. The 4-year average of incidents are trending downwards, also driven by a reduction of Control Systems incidents. Performance data is provided below for track and control system assets, including where performance trends have influenced asset renewal scope

Permanent Way

Permanent Way incident types comprise Track, Structures and Derailments (which are the result of a track defect). Incidents tend to be evenly distributed along the Moura corridor. Fry, Mt Rainbow and Earlsfield are the top 3 stations in terms of incident count over FY22-FY25.

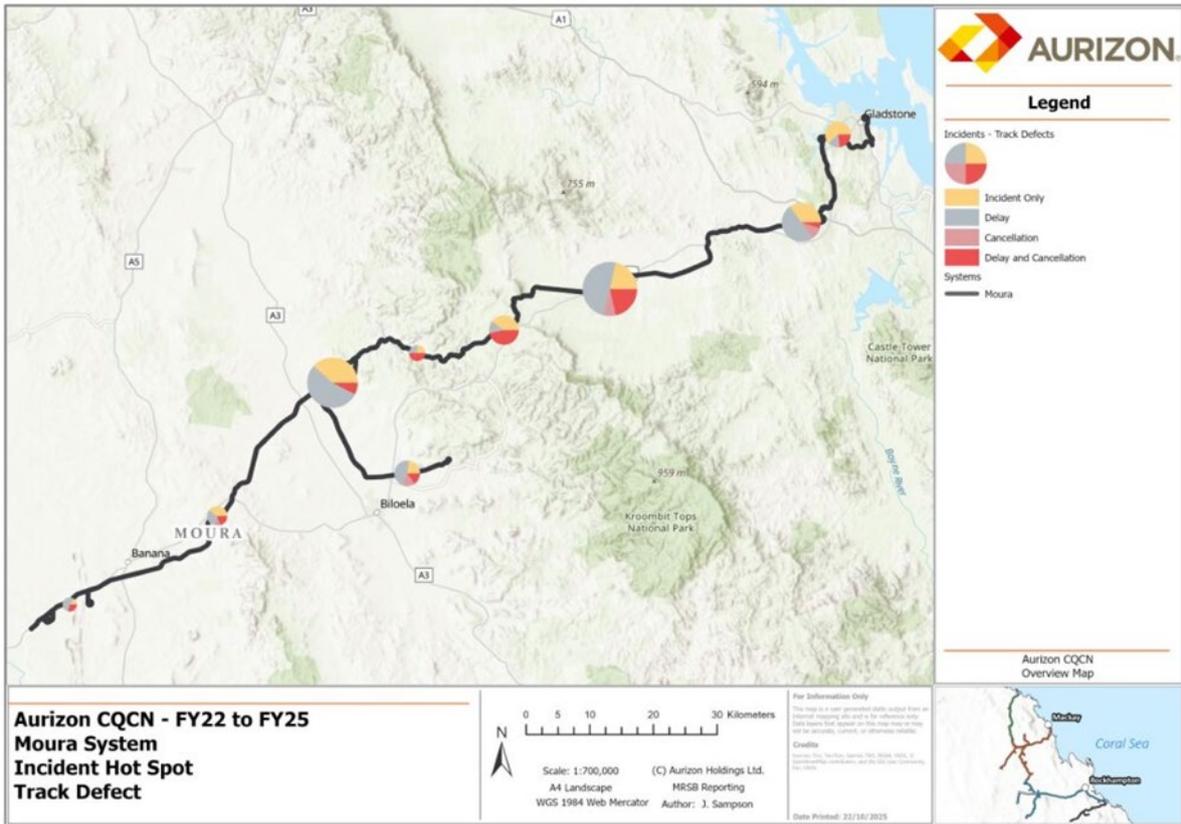


Figure 38 Permanent Way Incidents FY22-FY25 – Moura System

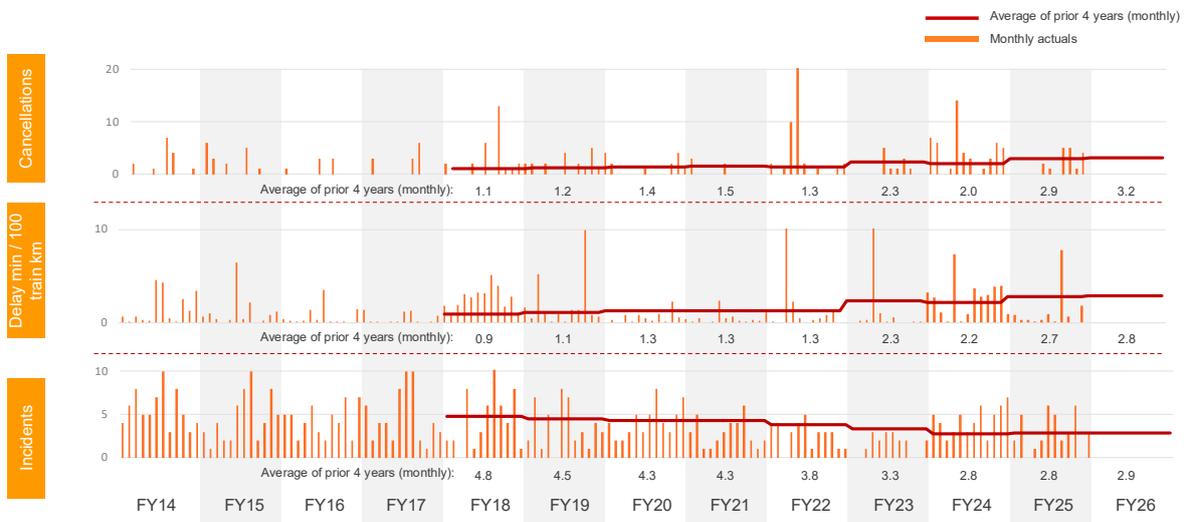


Figure 39 Permanent Way 4-Year Average Trends FY14-FY25 – Moura System

Key trends relating to Permanent Way have been identified:

- Permanent Way incident numbers have been reducing over time. While past 4 years have remained relatively constant, there are some notable trends between sub-categories and financial years.
- FY24 was an unusually challenging year for Moura. 50 cancellations resulted from 18 Permanent Way incidents, 11 of which related to Broken rails. 4 of these broken rails occurred in the Fry-Mount Rainbow section and a track buckle at Mt Rainbow caused 9 cancellations.

- Rail Renewals have been focusing on the Fry to Mount Rainbow area. 69km of rail was renewed in this area between FY24 and FY26.
- In FY27 in the Fry to Mr Rainbow area there are two Culvert renewals, and the renewal of over 1000 sleepers.
- Cancellations caused by Permanent Way reduced significantly in FY25 compared to FY24. However, the section of track between Mt Rainbow – Dumgree – Annandale were still heavily impacted by Permanent Way including two broken rails and three track buckles.
 - In FY27, 2.6km of rail renewals are planned for Dumgree – Boundary Hill and a turnout undercut is planned at Dumgree.
- Turnout defects have held relatively steady in Moura in FY25 compared to the 4-year average. The renewal strategy in Moura is primarily based on component renewals rather than full turnout renewals, which require long lead times for design and substantial closures for execution. The condition of older turnouts can be improved by component renewals and as the turnout population ages, there is an expectation of increasing allocation of component renewals to address turnout failures
- Temporary speed restrictions as measured by Delay minutes/100km have been fluctuating between an average of 10 in FY22 and FY24 and 14 in FY23. 4-year average is 11.0 min/100km. TSRs are cyclical and are usually more prominent with more rainfall. System closures provide an opportunity to do necessary work to reduce TSRs.
- Speed restrictions are a measure to control geometry-related track defects. Ballast renewals are planned in FY27 for 4.72km of the Belldeen to Moura mine Junction section. This site has poor ballast condition and top and line issues managed by speed restrictions.

Control Systems Faults

There is a wide array of control system defect types including Points failures, Track Circuit and Signal failures. Callemondah, Earlsfield and Stirrat are top 3 stations in terms of incident count over FY22-FY25. Figure 40 and Figure 41 show incident hotspots in the Moura System and the 4-year average trend for cancellations, delays and incidents.

Incidents tend to concentrate around Gladstone but are otherwise evenly distributed along the Moura corridor.

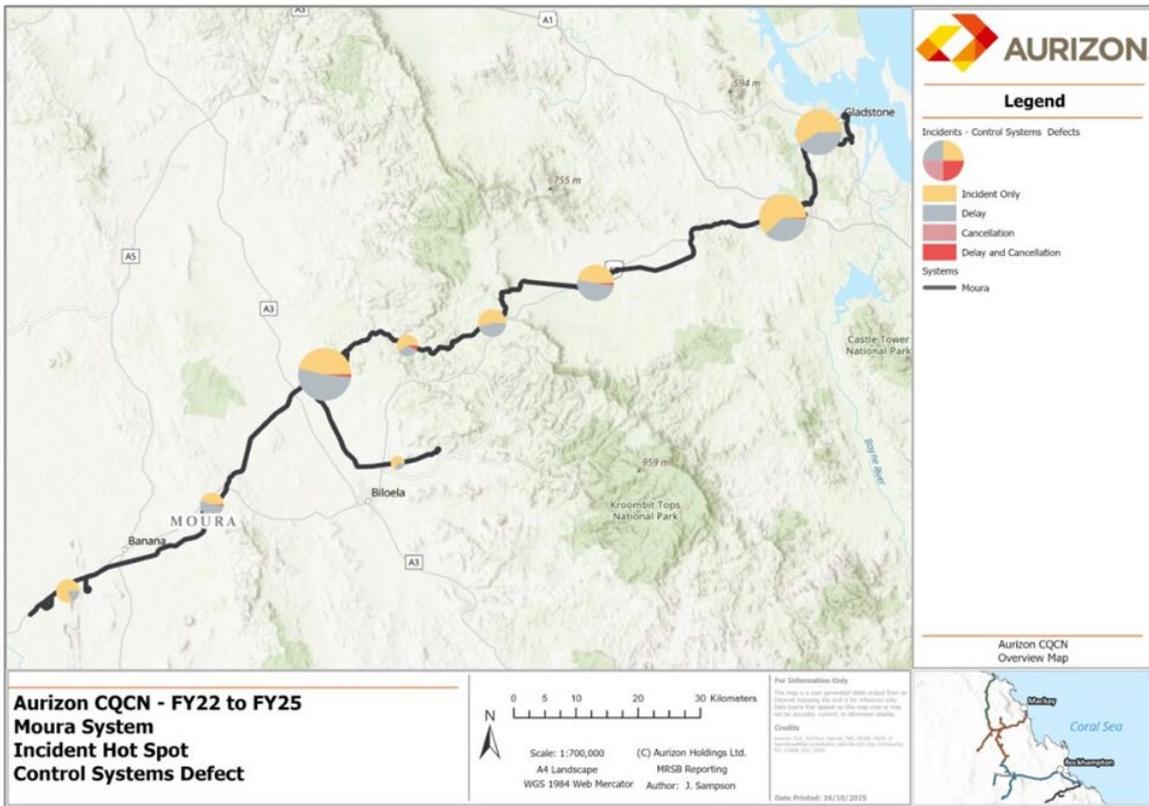


Figure 40 Control Systems Incidents Hotspots FY22-FY25 – Moura System

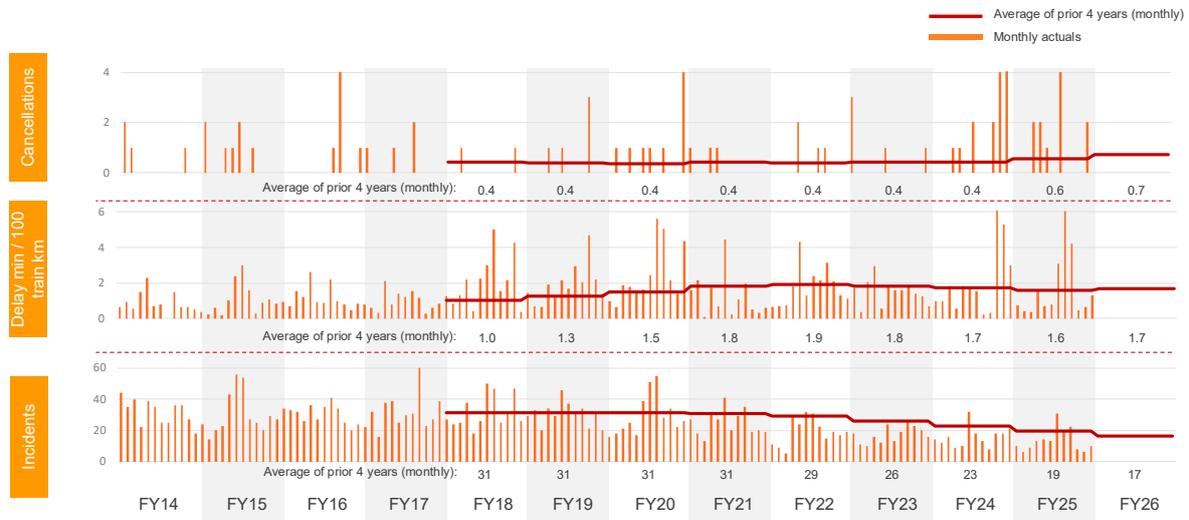


Figure 41 Control Systems Incidents 4-Year Average Trends – Moura System

Key trends relating to Control Systems have been identified:

- Control Systems incident numbers in Moura have reduced significantly over time. The reduction is across most incident types, however primarily driven by a reduction in track circuit failures, signal failures and points failures. The impact of incidents in terms of cancellations and delays has been fairly steady over time.
- Dumgree has been the number one hotspot for Control Systems faults over the past 4 years in terms of operational impact. This location has attracted 37% of Control systems cancellations and 17% of incident delay minutes.

- The VPI branded processor-based interlocking at Dumgree and the replacement of the Annandale-Dumgree axle counters in FY27 is aimed at replacing obsolete technology and will support improved control systems asset reliability at this location.

5.2 Renewals Budget – Moura System

Aurizon Network’s FY27 Final Draft Maintenance Renewals Strategy and Budget for the Moura system provides for Asset Renewals of \$23.0m. The program is proposing to renew between 0.1% and 3.2% of system assets by asset category and the average condition of Moura system assets (excluding strategic and reactive renewals) included in the renewals budget is 4.53 (very poor to failed).

The FY27 Final Draft Proposal is \$0.6m higher than the indicative FY27 forecast included in the FY26 MRSB and \$6.6m lower than the FY26 Budget.

This section provides a comparison of the scope selected for FY27 against the FY26 Budget and the indicative forecast for FY27 included in the FY26 MRSB. Variation in costs is as compared to the FY26 Budget.

FY27 Renewal Scope Selected – Moura System

Figure 42 provides a visual representation of the distribution of Civil and Control Systems scope across the Moura System. While the majority of work is proposed for the mainline to Collinsville. Work is proposed for NCL (Newlands) and on branchlines and individual balloon loops.

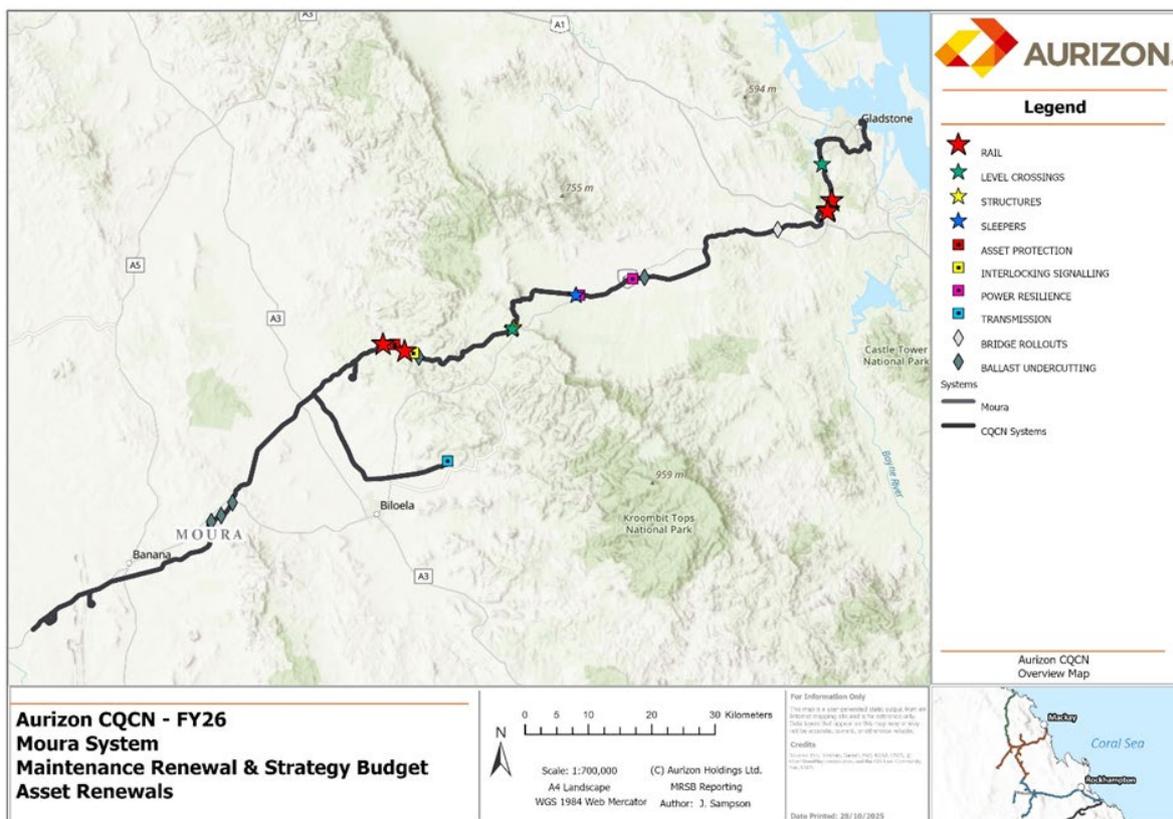


Figure 42 FY27 Civil Asset Renewal Locations – Moura System

The selection of scope each year is a product of multiple factors, depending on the asset class, that contributed to the assessment of condition and criticality. Information is provided in section 2.4

Improvements and Efficiencies on those elements of the renewal program that are correlated with System performance trends, the commentary below informs the scope selection for:

- driving scope for integrated closures or for a large proportion of single line possessions to support the impact on available capacity
- scope which has a complex delivery or the mix of scope items results in a material change in costs compared to FY26, or otherwise is
- scope which is material for the asset class and is also a substantial part of the budget in total.

This provides demonstration of the application of both the asset strategy and the process for selecting scope.

Rail/ Sleepers/ Track Upgrade

Rail renewal in FY27 is being delivered through the Rail Renewal program with no Track Upgrades. The program includes renewals across Byelle (combination of 3 sites) & Dumgree.(combination of 2 sites). All sites have a future condition rating of 3.5 (poor to very poor), are reaching their rail wear limits and are seeing multiple defects from rolling contact fatigue. The Byelle combined site renewal will see 21 rail lengths (2.367 rail km) renewed. The Dumgree combined site renewal will see 24 rail lengths (2.592 rail km) renewed.

The Sleeper Renewal program consists of a 1,009 sleeper renewal at Fry which has a future condition of 4.0 (very poor) and is replacing derailment-damaged sleepers. This site is driving scope for the January 60-hour closure.

Turnout Renewals

Two turnout component renewals are planned at Gladstone. Both have a future condition rating of 5 (failed). Component renewals are undertaken to extend the life of the asset without incurring the cost of a full renewal.

Ballast Cleaning

The Mainline Ballast Cleaning scope at Belldeen to Moura Mine Junction scope is the only scope item at 5.7km. This scope is broken over 3 sites and has an average PVC of 30% and a future condition of 4 (very poor). The sites have seen cancellations, TSR's and associated delays because of track alignment and ballast condition. Ballast undercutting at this site will improve ballast condition and reinstate free drainage of track structure resulting in an improvement in track alignment and stability. The scope is driving scope for the January 60 hour closure.

The 71 metre Bridge Rollout at Double Creek between Stowe and Stirrat has a future condition of 4.08 (very poor).

There are also two turnout undercuts at Clarke and Dumgree with a future condition of 4.23 (very poor).

Culvert and Level Crossing Renewals

The Fry Level Crossing is a key crossing for access and maintenance with a future condition score of 4.2 (very poor). It has a history of near misses due to poor sighting distance and approach angles. The crossing has also had a history of complaints around crossings / signage condition. A Corrugated Metal Pipe located under the crossing also needs to be renewed which triggered an integrated site renewal.

The three culvert renewals at Fry will:

- Eliminate and divert corroded corrugated metal pipe that is future condition rated as 4 (very poor).
- Replace life expired and corroded corrugated metal pipe with Reinforced Concrete Box Culvert to manage water flow (future condition 3).
- Replace life expired Reinforced Concrete Box Culvert that is showing pumping, movement and cracking (future condition 4).

Failure of one or multiple cells of culverts would manifest in track alignment defects requiring the imposition of significant operational restrictions and likely require an immediate repair causing significant disruption to the operations. These renewals are driving scope for the October 60-hour closure.

The level crossing at Callemondah (Jeffries Road) will also be renewed. It has a future condition score of 3.5 (poor to very poor).

Access Roads and Points Renewals

The Access Points program in FY27 includes a renewal scope site at Belldeen, which is a complex renewal due to the interface with the road authority.

Control Systems Renewal

Safe Working:

- Hot bearing detector / hot wheel detector at Dumgree. Design for the future condition rated scope of 4.0 (very poor) was completed in prior years. It is driving scope for the January 60 hour closure.
- Vital Processor Interlocking (VPI) at Dumgree which was commenced in FY26, is driving scope for January 60 hours, and has a future condition of 5.0 (very poor to failed). The VPI is a safety critical programmable logic controller used to control signalling and to prevent conflicting train movements and collisions. The Moura system VPIs were installed in the mid-1990's and are no longer supported for spare equipment. An ongoing program of work is planned to recover obsolete equipment to replenish inventory until all interlockings are eventually renewed.
- Minor will renew the RAB Host at Moura. RAB Hosts provide the virtual environment that enables the deployment of virtual servers rather than individual server hardware. The virtual environment also provides quick re-instatement of a server that has failed. Future scope designs will be completed for VPI replacement at Stowe.

Power Resilience renewals in FY27 are the replacement of two external genset controllers at Fry and Clarke to support the provision of standby power for Control Systems.

Transmission and Data Network includes the renewal of 2 data network routers and firewalls (future condition rating of 4, very poor), TETRA Radio Scope will focus on minor renewals to improve coverage of TETRA Radio and an allocation for reactive works for Tele Battery and Radome Replacement.

Table 42 a summary of Moura System renewals as a proportion of total system assets, as well as the condition and criticality of the sites selected.

Table 42 FY27 Renewals Strategy - Moura System

Renewal Item	FY27 Proposed Scope	FY27 No. of Sites	Avg Future Condition of Sites Selected	Avg Criticality of Sites Selected	Total System Assets	FY27 Scope % Total System Assets	Cost (\$m)
Civil Assets							19.3
Permanent Way							4.7
Rail Renewal (rail Km)	5.0	2	3.5	1.8	550	0.9	2.5
Sleeper Renewal (sleepers)	1,009	1	4.0	1.8	275	0.3	0.9
Permanent Way – Other			5.0				0.3
Turnout Components			5.0				1.1
Ballast Cleaning							5.8
Mainline Undercutting (track km)	5.7	1	4.1	2.5	275	2.1	3.2
Mainline Excavator Undercutting (track km)	1.0		5.0				0.9
Turnout Undercutting (site)	2	2	4.2	2.6	62	3.2	0.5
Bridge Rollout (m)	71	1	4.1	2.6	39	2.6	0.9
Monumenting (site)			5.0				0.3
Structures							2.4
Culvert Design (site)	4	3	4.3	3.1			0.1
Culvert Renewals (site)	3	2	4.3	3.8	550	0.5	2.2
Civil Renewals							6.4
Level Crossing Renewals (site)	2	2	3.8	3.0	148	1.4	1.9
Level Crossing Design (site)	2	1	3.9	3.2			0.1
Level Crossing Other			5.0				0.3
Formation Reactive	0.4		5.0		275	0.1	1.9
Access Points (site)	2	2	5.0	5.0			1.2
Access Roads (site)			5.0				0.2
Corridor Security Fencing (km)	12.7		5.0	5.0			0.7
Control Systems Assets							3.7
Safe Working Systems – Asset Protection (site/unit)	1	1	4.0	4.0			1.0
Safe Working Systems – Interlockings (site/unit)	2	2	5.0	4.5			1.0
Safe Working Systems – Train Detection (site/unit)	4	3	5.0	4.0			0.1

Renewal Item	FY27 Proposed Scope	FY27 No. of Sites	Avg Future Condition of Sites Selected	Avg Criticality of Sites Selected	Total System Assets	FY27 Scope % Total System Assets	Cost (\$m)
Safe Working Systems – Minor (site/unit)	2	2	5.0	4.0			0.9
Power Resilience	2	2	4.0	4.0			0.1
Transmission & Data Renewals (site/unit)	3	3	4.0	4.0			0.3
UTC DTC (site/unit)			5.0				0.1
Other Control Systems			5.0				0.0
Cyber Security	-	1	5.0	5.0			0.1
Total							23.0

Note: Figures may not add due to rounding.

FY27 Renewal Scope Variance Analysis – Moura System

Broadly, the variation in scope for each asset class compared to either the FY26 Budget or the indicative forecast for FY27 included in the FY26 MRSB is due to the review of asset condition and criticality as part of selecting scope for the FY27 Final Draft Proposal.

Compared to Indicative FY27 Forecast in FY26 MRSB (increase of \$0.6m):

Civil (\$0.5m or c.83% of increase) – Primarily due to an increase in access roads, points and culvert renewal scope and cost which is partly offset by a reduction in Sleeper renewal costs and turnout component scope.

Control Systems (\$0.1m or c.17 % of increase) – Small variations in scope and cost across multiple asset classes partly offset by reduction in estimated cost to deliver hot bearing detector (HBD)/ hot wheel detector (HWD) renewals.

Compared to FY26 Budget (decrease of \$6.6m):

Civil (decrease of \$6.7M) – Predominantly due to reduction in rail renewals scope, Turnout renewal cost, mainline undercutting costs and Level Crossing renewal scope, partly offset by increase in access roads and points scope and sleeper renewal scope.

Control Systems (\$0.1M increase) – Predominantly due to increase in costs from a change in asset protection program to renew HBD / HWD in FY27 costing more compared to Rail Bearing Acoustic Monitor in FY26, together with additional scope for power resilience and telecommunication batteries, partly offset by renewing a smaller VPI site in FY27 compared to FY26.

Table 43 is a summary of FY27 Moura System renewals compared to the Budget, at the program level.

Table 43 FY27 Renewals Budget - Moura System

Renewal Item	Assets Included	FY26 Approved Budget (\$m)	FY27 Proposed Budget (\$m)	FY26B v FY27B (\$m)
Civil Assets		26.0	19.3	(6.7)
Permanent Way	Rail, Track Upgrade, Sleepers, Turnouts	6.1	4.7	(1.5)

Renewal Item	Assets Included	FY26 Approved Budget (\$m)	FY27 Proposed Budget (\$m)	FY26B v FY27B (\$m)
Ballast Cleaning	Mainline and Turnout Undercutting, Bridge Ballast, Monumenting and GPR	7.3	5.8	(1.5)
Structures	Bridges and Culverts	3.0	2.4	(0.7)
Civil Renewals	Level Crossings, Formation, Access Points, Slope Stability	9.5	6.4	(3.1)
Control Systems	Safe Working, Train Control and Detection, Interlocking, Telecoms, Power Resilience, Transmission	3.6	3.7	0.1
Total		29.6	23.0	(6.7)

Note: Figures may not add due to rounding.

Table 44 provides detail on the variance between the FY27 Final Draft Budget and the FY26 Budget.

Table 44 Cost Driver Movement Summary – Moura System

RIG Category	FY26B v FY27B	Comment
Civil Assets	(\$6.7m)	
Permanent Way	(\$1.5m)	Rail, Sleepers & Track Upgrade – No Track Upgrades in FY27, with Rail Renewal scope reducing partly offset by increase in sleeper renewals. Turnout Renewal – FY27 will see 2 turnout component renewals which cost less than a full turnout replacement which were completed in FY26.
Ballast	(\$1.5m)	Mainline Undercutting – pre-dig assessments resulting in an average return rate for the crib (centre of the track) and shoulder at 3% and 62% (last year 11% and 27%) respectively have improved forecast screenability compared to FY26. As a result, FY27 scope is expected to require less time on track to complete the works and less ballast material requirements. Excavator Undercutting – Increased scope in FY27 with an additional 700m planned and an increased allocation for reactive works, up \$500k from FY26.
Structures	(\$0.7m)	Culverts - Less sites in FY27 with a similar cost budget as FY26. The variation in program cost relates to the differing mix of renewal types between years. In FY27, 2 of the 3 sites are full remove and replacements scopes whereas in FY26 only 1 of the 6 sites was remove and replace where the other sites were for pipelining or concrete works only. Culvert Estimate Assumptions – Year to year variation in the structures spend is driven by the mix of works. Network achieved program savings in FY25 and FY26 through procurement, where initial MRSB estimates proved conservative compared to vendor pricing. Consequently, the FY27 estimate reflects a better tender cost outcome than in prior years as this market tender saving is expected to exceed the FY26 tendered pricing.
Civil Renewals	(\$3.1m)	Level Crossings - FY26 saw the delivery of two active level crossing upgrades at Jambin as well as two level crossing renewals at Callemondah Drive, this drove a higher budget for level crossings. In FY27, only two crossings are seeing formation and pavement upgrades hence a smaller budget in FY27 compared to FY26.
Control Systems	\$0.1m	Interlockings – Smaller program in FY27 with only one smaller site at Dumgree planned for renewal, FY26 saw the completing of a larger site at Annandale

RIG Category	FY26B v FY27B	Comment
		Asset Protection – Increase in Asset protection scope in FY27 with the completion of a Hot Wheel Bearing detector at Dumgree.

Renewals Opportunities and Risks – Moura System

Aurizon Network has identified risks and opportunities across each renewals category in the Moura system. It has then quantified the possible value impact of these risk or opportunities eventuating in the FY27 MRSB period and assigned an associated value range to the budget that should be considered as the opening forecast for the delivery of the identified scope.

On a weighted average of estimate class and program value, the FY27 renewals budget should be considered as a Class 3 estimate.

The upper and lower bounds of this value range are the extremes off all risks, or all opportunities realising in the MRSB period.

Table 45 Opportunity and Risk Range – Moura System

	\$m
FY27 Renewals Budget	\$23.0
Class of Estimate at Submission	Class 3: +/-10%
Resulting Value Range	+2.3 / -\$2.3
FY27 Upper and Lower Value Range	Upper \$25.4 / Lower \$20.8

Figure 43 indicates each program of works plotted to represent the value of the program in FY27 and the class of estimate representing the value range at the point of MRSB submission.

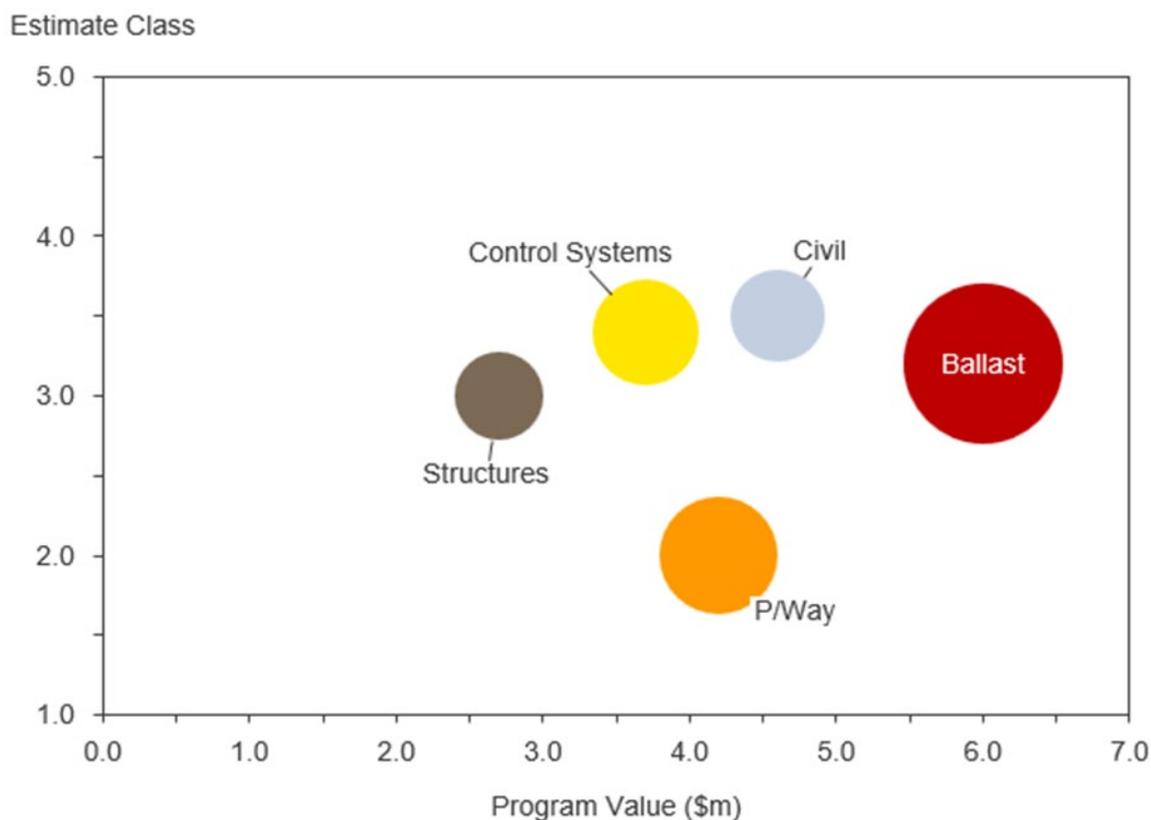


Figure 43 Program Value and Estimate Class – Moura System

Those programs that are typical Baseload scope attract a lower class of estimate that reflects the reduced level of expected delivery uncertainty. Those scope items that are Strategic in nature or at early stages of delivery planning, procurement or design at submission time attract a higher value range of estimate. Of note in FY27:

- The Control Systems program is considered at Class 4. Given the heavy dependence on external vendors and that Aurizon competes in a global market for electrical components. The procurement elements of this program have a significant impact on the actual versus forecast project cost. Aurizon develop its estimate given either last known costs from prior years or estimated costs based on early vendor engagement. The procurement process for the program will be completed ahead of the FY27 period, the outcome of these processes will result in the estimate being better defined prior to FY27 delivery.
- The Ballast program is at class 3. Actual return rate of ballast versus assumptions in estimate will be the main driver of variation both negative or positive in the year of delivery.

5.3 Maintenance Budget – Moura System

Aurizon Network has developed its Final Draft Maintenance Strategy and Budget for the Moura System having regard to all relevant matters outlined in clause 7A.11 of UT5, including the Maintenance Objectives. Aurizon Network considers its FY27 Final Draft Proposal provides an appropriate level of asset activity that will promote the safety, reliability and performance of the Moura System rail Infrastructure and seeking to deliver Committed Capacity.

Summary of Historic, Forecast and FY27 Maintenance Strategy and Budget – Moura System

Aurizon Network’s FY27 Final Draft Proposal for the Moura System provides for a Direct Maintenance Cost Allowance of \$20.0m (excluding ballast undercutting plant depreciation) and assumes delivery of efficiencies identified in section 2.4 Improvements and Efficiencies. The budget is largely informed by escalation, fixed internal labour and indirect costs and historical activity levels, with General Track, Signalling & Telecoms and Resurfacing activities representing ~76% of the system spend.

In order to maintain asset condition and reliability, a higher level of maintenance activity is expected to support the General Track Maintenance program including drainage, rail maintenance, vegetation and maintenance ballast activities. The FY27 Final Draft Budget is \$2.0m higher than the FY26 Budget.

Figure 44 and Figure 45 provide a summary of historic direct maintenance costs as well as the proposed direct maintenance cost allowance in respect of FY27.

To ensure comparability with prior periods, the direct maintenance costs shown in these figures exclude depreciation on ballast plant.

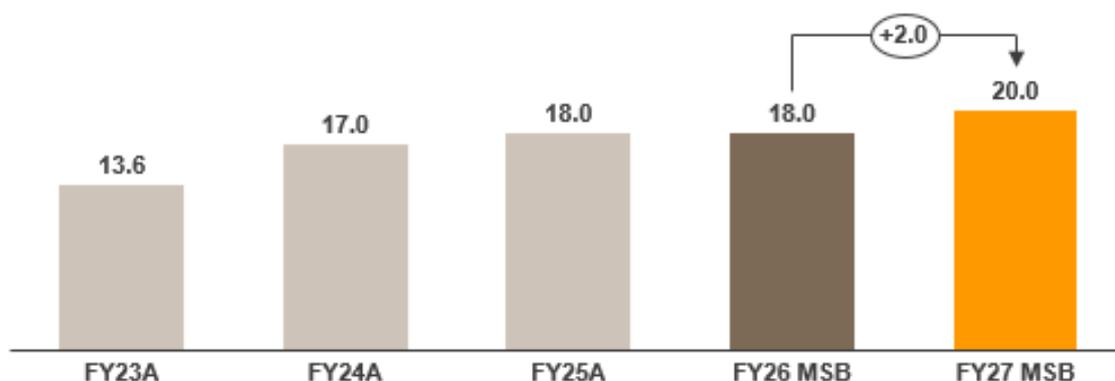


Figure 44 Historic Direct Maintenance Costs – Moura System

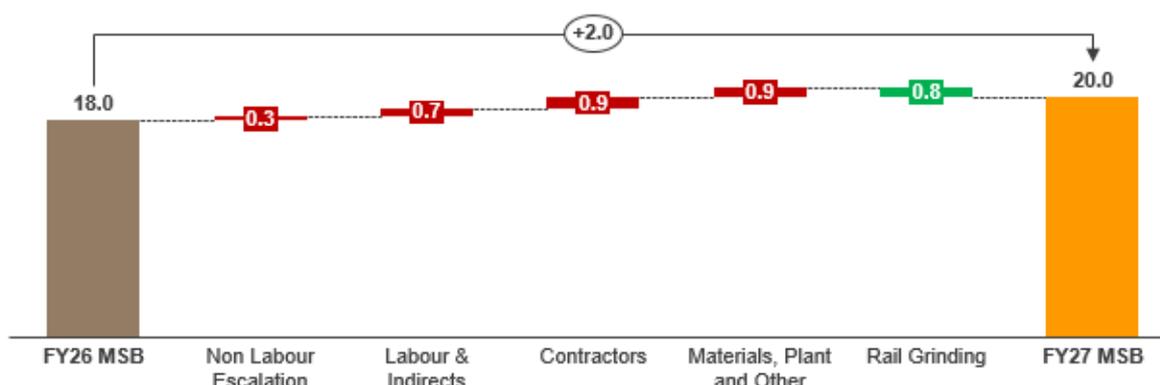


Figure 45 Cost Driver Movement Breakdown – Moura System

Table 46 describes the movement in maintenance spend against the prior approved budget, by cost category.

Table 46 Cost Driver Movement Summary – Moura System

Cost Category	Change	Comment
Non-Labour Escalation	\$0.3m	Increase driven by annual cost escalation on contractors, materials, plant, other consumables and rail grinding.
Labour and Indirect Costs	\$0.7m	<p>Labour and indirect cost included in the FY27 Final Draft Budget reflect the execution of the labour efficiency initiatives across all teams during FY26, to deliver on the target efficiencies overlaid in the FY26 Budget.</p> <p>Labour and Indirect costs increase against FY26 Budget is largely driven by:</p> <ul style="list-style-type: none"> Higher Track Resurfacing labour costs of \$0.2m which reflects both an increased scope and an increased allocation of the resurfacing team's labour due to lower plant maintenance activities. Civil Infrastructure labour reflecting a \$0.2m increase in labour support driven by a reprioritisation of Gladstone civil district from Blackwater to support increased maintenance levels in Moura. <p>Movements isolated above include annual increases required under the Infrastructure Enterprise Agreement and other Staff Agreements.</p>
Contractors	\$0.9m	<p>Contractor cost increase against FY26 Budget is driven by:</p> <ul style="list-style-type: none"> General Track maintenance \$0.8m as result of the inclusion of targeted drainage program of \$0.5m and additional contractor costs to support rail maintenance activity levels. Other Civil Maintenance \$0.1m reflecting an uplift in contractor costs to support higher corrective activity levels required to maintain asset condition.
Material and Plant Usage	\$0.9m	<p>Material and Plant Usage decrease against FY26 Budget is driven by:</p> <ul style="list-style-type: none"> General Track maintenance \$0.8m, reflecting a \$0.6m uplift driven by additional materials, consumables and internal plant costs to support ballast maintenance activities. Additionally, an increase in rail material cost is expected to support corrective rail maintenance defects \$0.2m. Higher Track Resurfacing materials and plant usage \$0.1m which reflects an increased scope, partially offset by reduced maintenance consumables and a lower allocation of resurfacing team labour due to reduced plant maintenance activities.
Rail Grinding	(\$0.8m)	Mainline scope has decreased driven by mine and spur grinding cycles falling outside the FY27 program. Additionally, turnout frequencies were realigned following the shift to individual FLOC identification.
Total	\$2.0m	

Note: Figures may not add due to rounding.

The proposed FY27 maintenance scope and budget for the Moura System is outlined in Table 47.

Table 47 FY27 Maintenance – Moura System

Maintenance Item	Scope Units	FY26 Budget Scope	FY26 Budget (\$m)	FY27 Budget Scope	FY27 Budget (\$m)	Variance (\$m)
Resurfacing			2.0		2.4	0.4
Mainline	Km	170	1.9	235	2.2	0.3
Turnout	Site	10	0.2	10	0.2	0.1
Rail Grinding			2.0		1.2	(0.8)
Mainline	Km	Redacted	1.7	Redacted	1.0	(0.7)
Turnout	Site	Redacted	0.3	Redacted	0.2	(0.1)

Maintenance Item	Scope Units	FY26 Budget Scope	FY26 Budget (\$m)	FY27 Budget Scope	FY27 Budget (\$m)	Variance (\$m)
Level Crossing	Track LX	<i>Redacted</i>	-	<i>Redacted</i>	-	-
General Track Maintenance			7.7		9.7	2.0
General Track	Activity		7.0		8.4	1.3
Corridor Maintenance	Activity		0.6		1.3	0.6
Ultrasonic Testing	Km	380	0.0	359	0.1	0.0
Signalling and Telecoms			2.8		2.9	0.2
Structures and Facilities			1.6		1.6	0.0
Trackside Systems			0.3		0.4	0.0
Other Civil Maintenance			1.1		1.2	0.1
Other General Maintenance			0.4		0.5	0.1
Sub-Total			18.0		20.0	2.0
Ballast Undercutting Plant Depreciation			0.3		0.2	(0.0)
Total Direct Maintenance Costs			18.2		20.2	2.0
Non-Coal Allocation			(0.1)		0.0	0.1
Total			18.2		20.2	2.0

Note: Figures may not add due to rounding.

Material movements in spend by maintenance category against the prior approved budget are also outlined in Table 48.

Table 48 Cost Movements by RIG Category – Moura System

RIG Category	FY26B v FY27V	Comment
Resurfacing	\$0.4m	Increase against the FY26 Budget reflects higher scope, with system-specific requirements now informed by ATIS data. Higher labour allocations also contributed, partially offset by lower resurfacing plant costs and reduced plant maintenance labour.
Rail Grinding	(\$0.8m)	Mainline scope has decreased driven by mine and spur grinding cycles falling outside the FY27 program. Additionally, turnout frequencies were realigned following the shift to individual FLOC identification.
General Track Maintenance	\$2.0m	<p>Increase to FY26 Budget driven by the following changes:</p> <ul style="list-style-type: none"> Inclusion of contractor costs to execute 3 targeted corridor drainage sites, with very poor drainage condition. Additional internal labour support, contractor support and rail materials required to support corrective rail maintenance activity levels. Additional materials and consumables costs to support ballast maintenance activity levels Offset by a minor reduction in external contractor spend following introduction of the granular herbicide vegetation management approach. <p>Please refer to Drivers of Change in Maintenance Budgeting Approach – General Track in Appendix 6 – Works End to End Process for additional</p>

RIG Category	FY26B v FY27V	Comment
		information on budget assumptions for rail maintenance, targeted drainage and vegetation management activities.
Signalling and Telecommunications	\$0.2m	Minor uplift driven by escalation.
Other Civil Maintenance	\$0.1m	Minor uplift driven by escalation.
Other General Maintenance	\$0.1m	Minor uplift driven by escalation.
Ballast Plant Depreciation	\$0.0m	Ballast undercutting plant depreciation in broadly in line with the FY26B, with the allocation between systems based on the number of days that the ballast plant is expected to be operating in the Moura system in FY27.

For additional information on the budgeting approach and assumptions, please refer to Budget Setting and Procurement in Appendix 6 – Works End to End Process.

Figure 46 sets out a summary of historic and budgeted direct maintenance costs by maintenance category. To ensure comparability between periods, the direct maintenance costs presented in these figures exclude depreciation on ballast undercutting plant.



Figure 46 Direct Maintenance Costs by Category – Moura System

Figure 47 sets out a summary of historic and budgeted direct maintenance costs by activity type.

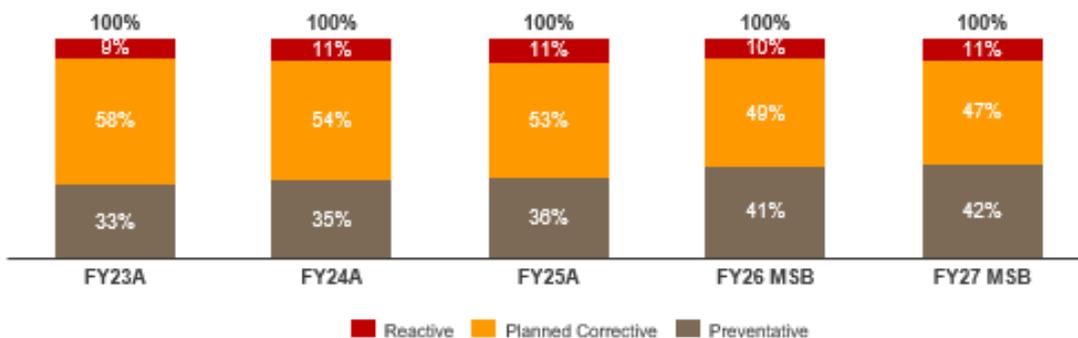


Figure 47 Direct Maintenance Costs by Activity Type – Moura System

5.4 Integrated Closure Plan – Moura System

Aurizon Network has developed an access plan to deliver the required scope for the Moura System while balancing cost and access.

FY27 will see a significant uplift in integrated closure hours due to coordinated alignment of Moura and Blackwater shutdowns, enabling the delivery of large-scale work programs (304 Integrated Closure hours and 183 Single Line Hours). Coordinating corrective maintenance (CETS) with supply chain outages helps maintain a steady flow of railings for domestic terminal customers by minimising disruptions.

Table 49 summarises Aurizon Network’s approach, incorporating customer and supply chain feedback received through development of the FY27 MRSB.

Table 49 FY27 Supply Chain Considerations – Moura System

Opportunity	Details
Optimising for Throughput	<ul style="list-style-type: none"> Integrated closures not planned in July 2026 and June 2027 to help maximise throughput. Aligned single line scope between disciplines where possible (e.g. RM902 plus bridge rollout plus rerail).
Supply Chain Alignment	<ul style="list-style-type: none"> Aligned with Queensland Rail closures on the North Coast Line (NCL) to reduce cumulative impacts (involving changed team roster pattern). Managing distribution of work to maintain supply chain continuity. Packaging and aligning corrective maintenance with moving product (CETS) shadows and other supply chain participant’s outages.
Closure Timing	<ul style="list-style-type: none"> Closures planned to avoid public holidays, weekends (where practical). Considerations for regional events such as Beef Week, Rocky Nats, and significant sporting events to assist accommodation availability for crews Higher ramp up of resurfacing machines within closures, allowing more work to be planned.
Program Staging	<ul style="list-style-type: none"> Callemondah Interlocking Project - Three coordinated closures across Blackwater and Moura to reduce from a large 290hr closure. Visibility of future year renewal scope used to make cost and access efficient decisions. Avoiding high risk scope in the wet season where possible. Turnout undercutting packaged at stations for efficiency and to reset to design.
Integrated Closure Summary	<ul style="list-style-type: none"> 4 closures planned for FY27.

Table 50 Planned Integrated Closures and Branch Closures – Moura System

FY27 Integrated System Closures													
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
Location		BW		BW			Byelle				BW		
		Calle		Calle			Moura				Calle		
Hours	0	60	0	84	0	0	60	0	0	0	100	0	304

Table 51 Driving Path Scope – Moura System

Closure	Driving Path Activities	Location
August		
60-hour	Bridge Ballast Renewal	Graham – Stirrat
October	Level Crossing and Culvert	Fry
84-hour		
January	Interlocking Renewal	Dumgree
60-hour	Sleeper Renewal	Fry
	RM902 Undercut	Belldeen – Moura
	Level Crossing	Callemondah

Note: There is no driving scope for the May 100hr closure.

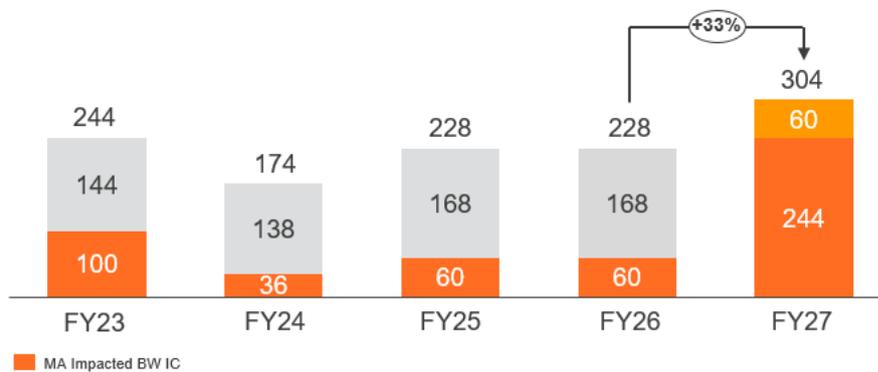


Figure 48 Trend of Integrated System Closure Hours (Mainline Only) FY23-FY27 – Moura System

5.5 Four-Year Forecasts – Moura System

This section outlines Aurizon Network’s indicative cost forecasts for Maintenance and Asset Renewal activity in each Coal System. Information is provided for this FY27 Final Draft Proposal plus a forecast period of four years (FY28 – FY31).

The FY28 – FY31 indicative cost forecasts are provided to increase transparency on forward looking asset renewals and maintenance expenditure. It is a high-level estimate based on currently available information. The outer year forecasts are predominantly based on the age of the asset and the strategic annual scope target to manage known future resourcing and access constraints where a significant number of assets are forecast to require renewal in similar periods (referred to as the ‘bow wave’ of required investment). For this reason, in a number of circumstances the number of renewals has been identified in each system and the specific site will be identified as further information about asset condition, viability of alternate multi-year asset management approaches, engineering designs, the access footprint and resourcing available to deliver the renewals become available.

Each future forecast will consider the re-phasing of scope from year to year where scope has been deferred into future years or future scope has been brought forward.

Table 52 FY27 Plus Four-Year Maintenance Cost Forecast (Nominal \$m) – Moura System

System Maintenance	FY27	FY28	FY29	FY30	FY31
Resurfacing	2.4	2.5	2.6	2.6	2.7
Rail Grinding	1.2	1.8	2.1	1.9	1.9

System Maintenance	FY27	FY28	FY29	FY30	FY31
General Track Maintenance	9.7	10.1	10.4	10.7	11.1
Structures and Facilities Maintenance	1.6	1.0	1.1	1.8	1.9
Other Civil Maintenance	1.2	1.2	1.2	1.3	1.3
Signalling and Telecommunications Maintenance	2.9	3.0	3.1	3.2	3.3
Trackside Systems Maintenance	0.4	0.4	0.4	0.4	0.4
Other General Maintenance	0.5	0.5	0.6	0.6	0.6
Total Direct Maintenance Costs (excl. Ballast Undercutting Plant Depreciation)	20.0	20.5	21.4	22.5	23.2
Ballast Undercutting Plant Depreciation	0.2	0.2	0.2	0.2	0.2
Total Direct Maintenance Costs	20.2	20.7	21.6	22.7	23.4

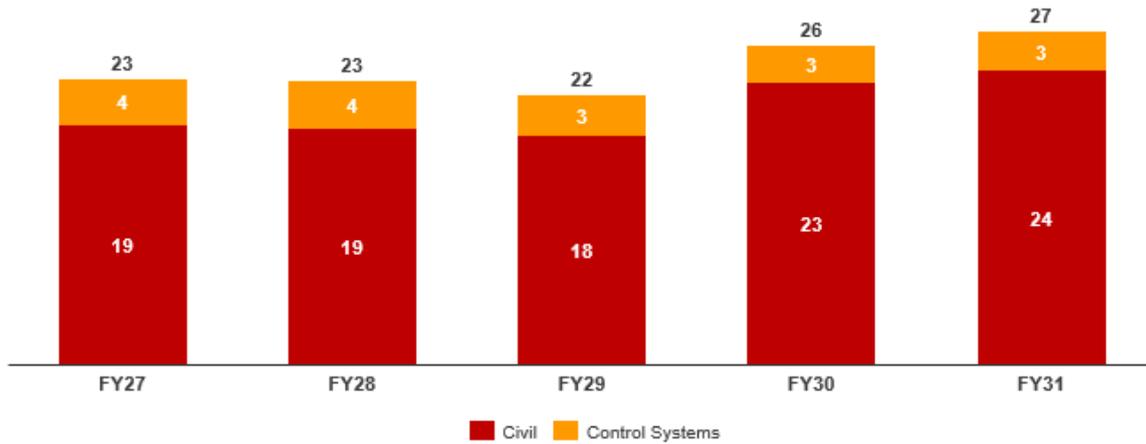
Notes:

- 3.2% escalation has been included for FY28 onwards.
- Rail Grinding forecast includes cost escalation and scope variation year on year driven by anticipated grinding requirements and stable management of rail asset condition. Future estimates are indicative only and may be subject to change and will be iterated in future MRSB submissions for RIG review and approval.
- General Track Maintenance forecast reflects a continued level of rail maintenance activity and targeted drainage works.

Table 53 FY27 Plus Four-Year Renewals Cost Forecast (Nominal \$m) – Moura System

Renewals Item	Asset Included	FY27	FY28	FY29	FY30	FY31
Civil Assets		19.3	19.0	18.4	22.6	23.6
Permanent Way	Rail, Track, Sleeper, Turnouts	4.7	5.5	5.2	7.1	7.4
Ballast Cleaning	Mainline and Turnout Undercutting, Bridge Ballast	5.8	7.8	7.6	8.5	8.9
Structures	Culverts, Bridges	2.4	1.5	1.6	1.7	1.8
Civil Renewals	Formation, Level Crossings, Access Points	6.4	4.1	4.0	5.3	5.6
Control Systems	Safe Working, Train Control and Detection, Interlocking, Telecoms, Power Resilience, Transmission, Optical Fibre	3.7	3.8	3.3	3.0	3.1
Total		23.0	22.8	21.7	25.6	26.7

Note: 4.4% escalation has been included.



Note: Four-year forecast is indicative only and does not account for access, resource considerations, detailed design and associated costings.

Figure 49 FY27 Plus Four-Year Renewals Cost by Scope Category (Nominal \$m) – Moura System

Four-Year Forecast Commentary – Moura System

Civil

The Ballast Cleaning program is 40% of the Civil program across the four-year forecast period. It includes on average 7km of ballast undercutting and 2 turnouts.

The renewal of Permanent Way assets is approximately 30% of the civil program and includes an average of 530 sleepers, 3 rail km, 1 track km (both sleepers and rail) and 1 turnout component per year.

Structures include the renewal of an average of 3 culverts per year.

The majority of costs in the civil renewal program are attributable to 0.4km of Formation, 1 Level crossing each year and access points and roads.

Control Systems

Safe Working Systems – Interlockings, Safe Working Systems – Minor, Transmission and Data Renewals, represent approximately 95% of the Control Systems four-year forecast.

Safe Working Systems – Interlockings to replace life expired assets.

Safe Working Systems – Minor is the design and planning for the replacement of Interlockings

Renewals for Transmission and Data predominantly include radome replacement, control system infrastructure and routers, switches and firewalls.

6 Newlands System and GAPE

Newlands and GAPE System Summary	
Newlands and GAPE Asset Management Strategy	Maintain a stable level of service over the long-term and undertake preventive and planned corrective maintenance and asset renewals ahead of unplanned failure or obsolescence.
Guidance for Decision Priorities	<p>In determining the trade-off decisions for the renewal programs the following prioritisation has been considered, after discussion with the Rail Industry Group:</p> <ol style="list-style-type: none"> 1. Access 2. Scope 3. Cost <p>Prioritisation is based on assumptions that demand was strong and above Committed Capacity and infrastructure reliability and performance is steady.</p>
Renewals Budget	<p>Asset Renewals of \$38.1m to renew between 0.2% and 4% of system assets with an average condition 4.20 (very poor) and assumes delivery of targeted efficiencies identified in FY26.</p> <p>Compared to the indicative forecast for FY27 included in the FY26 MRSB, FY27 renewals have decreased by \$4.0m due to a reduction in cost estimates for rail renewal, track upgrade, mainline undercutting and culvert renewals.</p> <p>Compared to the FY26 Budget, FY27 renewals have increased by \$6.3m due to scope increases in rail renewals and track upgrade and cost increases in sleeper renewal, partly offset by cost reductions in track upgrade.</p> <p>Aurizon Network proposes to allocate the total Capital Indicator as follows:</p> <ul style="list-style-type: none"> • \$35.2m allocation to Newlands System Allowable Revenues and Reference Tariffs; and • \$2.9m allocation to GAPE Allowable Revenues and Reference Tariffs.
Maintenance Budget	<p>Direct Maintenance Cost Allowance of \$20.4m (excluding ballast undercutting plant depreciation) and assumes delivery of targeted efficiencies identified during FY26. General Track maintenance, Signalling & Telecoms and Rail Grinding activities represent 76% of the system spend.</p> <p>To maintain asset condition and reliability, a targeted drainage program has been included together with a higher level of maintenance activity to support General Track and Signalling & Telecoms Maintenance programs. The FY27 Final Draft Budget is \$4.3m higher than the FY26 Budget.</p> <p>Aurizon Network proposes to allocate the total Maintenance Indicator (including ballast plant depreciation) as follows:</p> <ul style="list-style-type: none"> • \$8.9m allocation to Newlands System Allowable Revenues and Reference Tariffs; and • \$11.8m allocation to GAPE Allowable Revenues and Reference Tariffs.
Integrated Closures and Capacity Impact	<p>System has sufficient capacity to meet DNC and includes:</p> <ul style="list-style-type: none"> • Increase in total mainline closure hours by 25% compared to FY26, with 2 planned Integrated Closures.

Newlands and GAPE System Summary

- Closure timing aligned with port shutdown activity presenting nil additional impact, with durations & handback timed to enable supply chain remobilisation prior to port re-opening.

Opportunity and Risks

At +/- 10% estimate. Renewals upper and lower value range is \$41.9m and \$34.3m.

6.1 Asset Management Strategy – Newlands System and GAPE

The asset management approach for the Newlands System and GAPE is reflective of the current tonnage profiles and asset age mix. It seeks to maintain a stable level of service over the long-term and undertake preventive and planned corrective maintenance and asset renewals ahead of unplanned failure or obsolescence.

The Newlands System (which includes Rail Infrastructure constructed as part of the GAPE project) is a mix of new, recently upgraded, and original assets. As such most of the maintenance and renewal efforts are focused on the aged assets in the shared Newlands Rail Corridor that were not upgraded or renewed during the GAPE.

The Newlands System and GAPE rail infrastructure is being maintained for forecast tonnages and not nameplate capacity.

In January 2025, demand for FY27 was estimated to be strong. Therefore, in the FY27 MRSB, access has been prioritised over scope and cost with respect to trade-off decision when performing work. This is in context of the ACAR 2024 where a shortfall of available capacity is anticipated, and asset performance trends are steady. The following is an example of this decision making for the Newlands System and GAPE:

- Bridge Rollout at Bowen River was deferred out of the FY27 renewal program to reduce the risk that remaining scope in the September closure could be completed without additional closure hours. The deferral will also support the investigation of alternate delivery methods to reduce access impacts or cost. The condition of the asset was assessed at 3.9 and will need to be monitored until renewal in FY28.

Asset Renewal Strategy – Newlands System and GAPE

The Newlands System is located at the northern end of the Bowen Basin connecting to the port at Abbot Point. The system serves mines located in the Newlands System, as well as mines located in the Goonyella System via the GAPE Link and coal services from the Galilee coal basin. The Newlands System and GAPE are not electrified.

Table 54 outlines the asset profile of the Newlands System and GAPE.

Table 54 Asset Profile – Newlands System and GAPE

Renewal Item	Comment
Civil Assets	The GAPE project built a 65km greenfield connection between Goonyella and existing Newlands Systems in 2011 and upgraded the Newlands System from 20 tonne axle load to 26.5 tonne axle load through sections of rail replacement and formation strengthening. Renewal activities are centred around the sections that were not upgraded in 2011 which include sections of 53kg rail and fist fastener sleepers associated with the original 20 tonne axle load operations. There is approximately 213km of track in the Newlands system with a combination of 53kg and 60kg rail (including passing loops and balloon loops). Prioritisation of rail renewal locations is decided based on condition which includes rail wear, fatigue (identified through rail defect history), whether the condition aligns to the specific section under consideration (i.e. fit-for-purpose) and location criticality. The quantity replaced in future years may change dependant on annualised tonnage profiles (and forecast) as well as ongoing monitoring of defect quantities.
Control System Assets	This asset class was also modernised during the GAPE project with upgraded sections making use of the installed optical fibre cable which was part of GAPE. Like the civil assets, these upgrades are intermixed with aged assets. Trains are detected through a mix of track circuits and axle counter track sections with ongoing renewals

Renewal Item	Comment
	programmed for life expired axle counter assets in future years. The radio system across Newlands was upgraded in recent years to a digital based Terrestrial Trunked Radio (TETRA) system. To mitigate against cyber security threats, a Network Cyber Security Project has been established to deliver an industry aligned model that provides separate security zones for Information and Operational technology systems. The transition of OT Systems to the segregated environment requires the migration of 24 discrete systems structured into three stages to improve delivery efficiency, cost control and interface risk management. Stage 1 focuses on the migration of high priority mission critical systems (7 of the 24 systems, representing 29%). This approach reduces operational and cyber exposure as quickly as possible while establishing repeatable migration patterns that will inform more accurate cost and schedule estimates for subsequent stages. Accordingly, the FY27 budget only provides for delivery of Stage 1, with additional customer engagement to finalise the approach for Stages 2 and 3 planned in FY26 and FY27.

Asset Maintenance Strategy – Newlands System and GAPE

Maintenance activity is focused on inspecting and maintaining the in-situ condition of assets, repairing or implementing and maintaining minor holding works (including Temporary Speed Restrictions) following identification of a defect or infrastructure failure to minimise the impact and duration of unplanned outages.

The planned and preventive maintenance activities and inspections, including the planned mechanised production scope, as per the requirements of Aurizon Network’s Asset Maintenance and Renewal Policy and associated standards. The inspection regime and frequency are based on asset type, condition and location with defined intervention frequency levels. These can include:

- Usage-based - Example: track resurfacing is required every 50 million gross tonnes
- Time-based - Example: turnouts requiring weekly visual inspections and a detailed annual inspection
- Age-based - Example: 22.5 tonne axle load concrete sleepers being replaced every 40 years
- Fix on failure.

The scope of planned corrective and reactive maintenance tasks is heavily dependent on the faults identified via the planned inspection programs.

Aurizon Network has assumed that in FY27, the Newlands System and GAPE will see a similar level of faults that require planned corrective or immediate response as in prior years using the 3-year average and adjusted for known or anticipated risks. Included in the Maintenance strategy is a focus on rail with the ultrasonic testing, required grinding and repair of the life expired 53kg/m and 60kg/m rail and targeted corridor drainage program in Newlands.

Table 55 summarises the assumptions for the Newlands System for material maintenance items where the scope assumptions are different to the 3-year average.

Table 55 Asset Maintenance Profile – Newlands System and GAPE

Maintenance Item	Comment
Resurfacing	10% of maintenance budget.

Maintenance Item	Comment
------------------	---------

	<p>Track resurfacing restores the health of the track and ballast assets. It can be both condition or tonnage-based intervention and can be both preventive and corrective.</p> <p>Preventative resurfacing scope is developed using track geometry data captured with ATIS together with historical failures and weather factors.</p>
--	--

Rail Grinding	<p>17% of maintenance budget.</p> <p>Preventative grinding strategy with small amount of corrective allowance to reduce rail breaks and extend the life of rail. Tonnage based intervention translated to time-based frequency to allow long term planning.</p>
---------------	---

General Track	<p>36% of maintenance budget.</p> <p>Replace rail, turnout maintenance and GIJ and welds represent 40% of costs</p> <p>Rail maintenance is expected to be higher than the 3-year average. Inspections and incidents have seen higher number of rail defects and corrective work activity throughout FY25, predominantly replacing rail due to older, life expired fatigued rail. In FY25, the number of rail repairs was 33% higher than the average number of rail repairs from FY24 to FY25, and the number of defects identified by non-destructive testing (ultrasonic) tripled in FY25 compared to the prior three years (143 compared to 32).</p> <p>Vegetation management supports safety through line of sight and egress to the corridor for train crew, maintenance workers and public at level crossings. Additionally, good vegetation management helps prevent electrical faults related to trees and branches falling on overhead line equipment.</p> <p>The Targeted Drainage Program is a strategic initiative designed to address compromised longitudinal drainage adjacent to track infrastructure. This typically occurs within cuttings and embankments where natural erosion, compounded by wet weather, leads to siltation and blockage of drains. It is a 5-year program in addition to the localised drainage maintenance that focuses on sites of less than 100 metres with identified defects to be repaired in that year.</p> <p>At the completed targeted drainage sites, a steady ongoing drainage maintenance program as part of localised drainage maintenance in the General Track Maintenance category is planned to maintain drainage paths and minimise natural erosion and siltation levels. The following sites are included for FY27.</p>
---------------	--

Section	Drainage Asset Condition Rating	Drainage Asset Condition Definition	Nominated Priority
Armuna - Buckley	4.0	Very Poor	Required
Cockool - Havilah	4.0	Very Poor	Very Highly Recommend
Havilah – Newlands	4.0	Very Poor	Very Highly Recommend

Note:

Required: Have been assessed as having a very poor condition, compared to all sites in the CQCN have a higher performance impact, higher number of formation failures and a lower \$/t capacity benefit.

Very Highly Recommended: Have been assessed as having at least 3 of the 4 benefits of 'Required'.

Highly Recommended: Poor to very poor condition, with either high history or potential performance impact or high number of formation failures historically.

Recommended: Very poor condition with lower historical or potential performance impacts and lower number of formation failures.

Maintenance Item	Comment
	Further information on the drivers of change in General Track maintenance can be referenced in Drivers of Change in Maintenance Budgeting Approach – General Track in Appendix 6 – Works End to End Process.
Signalling and Telecoms	22% of maintenance budget Signalling and telecoms assets do not wear with tonnage and often don't show degradation until the point of failure. These assets are characterised by a stable period after install where the rate of failure is relatively low and constant. As components wear out and reach the end of their service life, the rate of failure rapidly increases. Maintenance is focused on inspection, servicing and monitoring of the asset. FY25 has seen an increase in control systems incidents by 10-15% compared to previous year, driven by increases in signal failures, track circuit failures and telemetry failures. In addition, points failures is a key driver for corrective and reactive maintenance. The installation of remote-controlled signalling also contributes to increased signalling and telecoms maintenance.

Performance Trends – Newlands System and GAPE

The trend of 4- year averages for cancellations, delays and incidents provide an indication of the performance impact to customers of the asset management strategy over the short and medium term and is one factor in determining asset renewal scope.

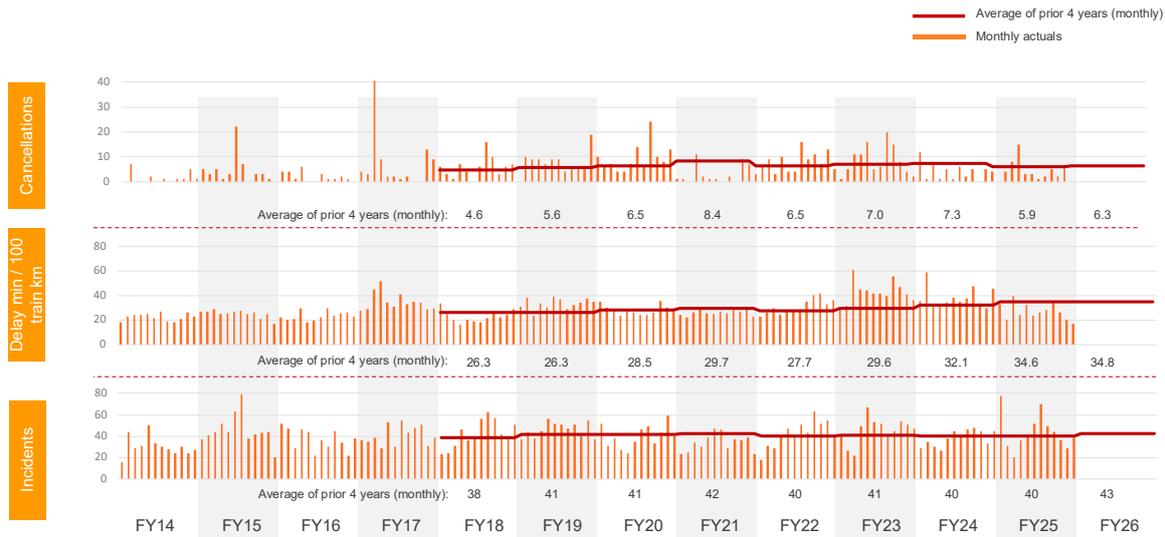


Figure 50 4-Year Average Performance Trends – Newlands System and GAPE

In Newlands and GAPE, the 4-year average for incidents and cancellations has held relatively steady since FY2018. While delays have increased over time, the main contributor has been increasing planning delays as increased traffic on the Newlands systems requires additional crossing delays. Performance data is provided for track and control system assets, including where performance trends have influenced asset renewal scope. Please refer to the Glossary for interpretation of these graphs.

Permanent Way

Permanent Way incident types are comprised of Track, Structures and Derailments (which are the result of a track defect). Incidents tend to be fairly evenly distributed with the exception of Buckley station, close to Pring yard, which saw a large number of incidents in relation to track geometry defects in FY22 and FY23. Formation renewals have since been completed at this site, resulting in a reduction of geometry defects. Buckley, Havilah and Cockool are top 3 stations in terms of incident count over FY22-FY25.

Figure 51 and Figure 52 show incident hotspots in the Newlands System and GAPE and the 4-year average trend for cancellations, delays and incidents.

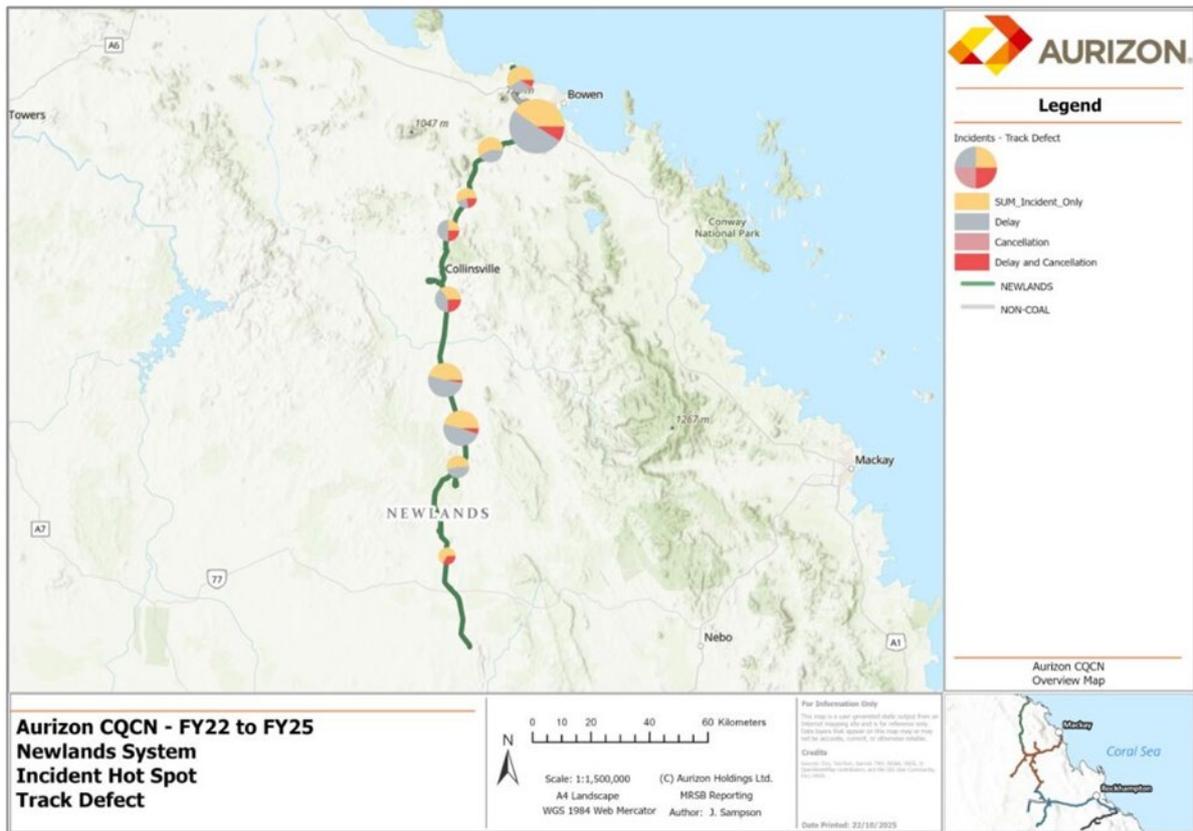


Figure 51 Permanent Way Incidents FY22-FY25 – Newlands System and GAPE

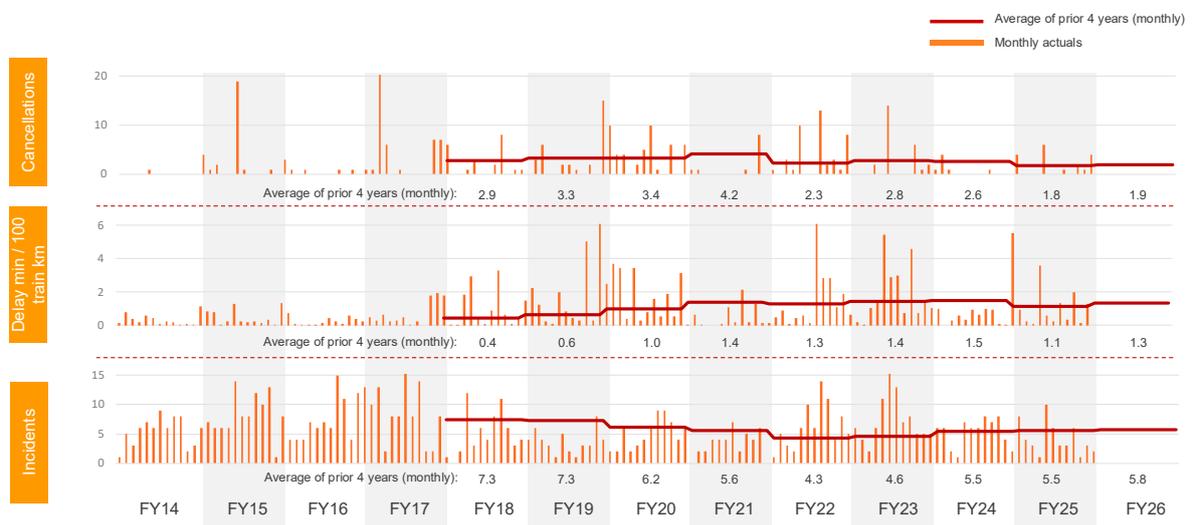


Figure 52 Permanent Way 4-Year Average Trends FY14-FY25 – Newlands System and GAPE

Key trends relating to Permanent Way have been identified:

- Permanent Way incident numbers are keeping close to the 4-year average. While overall incident numbers remain constant over time, there are some notable trends in Permanent Way sub-categories.

- Two trends playing out in FY25 have bearing on the FY27 maintenance and renewals program. A reduction in Broken Rails was observed in FY25, while the number of ultrasonically detected faults has increased, impacted by transverse weld defects associated with older fatigued rail. The ultrasonic program has proven effective in identifying rail defects before rail breaks occur.
- The increased incidence of ultrasonic faults in older fatigued rail has put greater emphasis on the rail renewal program, which is primarily focused on planned rail renewal and track upgrade scope, with a minor reactive renewal component. Newlands will see an increase in rail renewals in FY27 and in future years in order to accelerate the replacement of fatigued rail.
 - Rail Renewals in FY27 are directed at sections of track to primarily address rail wear and rail fatigue.
 - The renewals strategy in Newlands is focused on track upgrades and renewals of older fatigued 53kg and 60kg rails. In FY27, 5.5km of track upgrades and 14.3km of Rail renewals have been planned.
 - Track and/or rail renewals at Cookool, Havilah and Kaili will improve sections of track that have elevated levels of track fault incidents during FY24 and FY25, including 2 broken rails causing 8 train cancellations. Although site selection is based on multiple factors, the locations for rail and track renewals for Newlands in FY27 are aligned with 55% of Permanent Way incidents occurrence.
 - Temporary speed restrictions as measured by Delays minutes/100km have been fluctuating between an average of 2.3 in FY24 and 4.0 in FY25. The 4-year average is 3.27 min/ 100km. TSRs are cyclical and are usually more prominent with more rainfall. Ballast Renewals at Abbot Point and Armuna and formation renewals at Cockool in FY27 will support for healthy track geometry in Newlands.

Control Systems Faults

There is a wide array of control system defect types. Key incident types include Points failures, Track Circuit and Signal failures. Figure 53 and Figure 54 show incident hotspots in the Newland System and GAPE and the 4-year average trend for cancellations, delays and incidents.

Control Systems incidents tend to concentrate around the Pring to Abbot Point area, with Durraburra station attracting a high number of points failures.

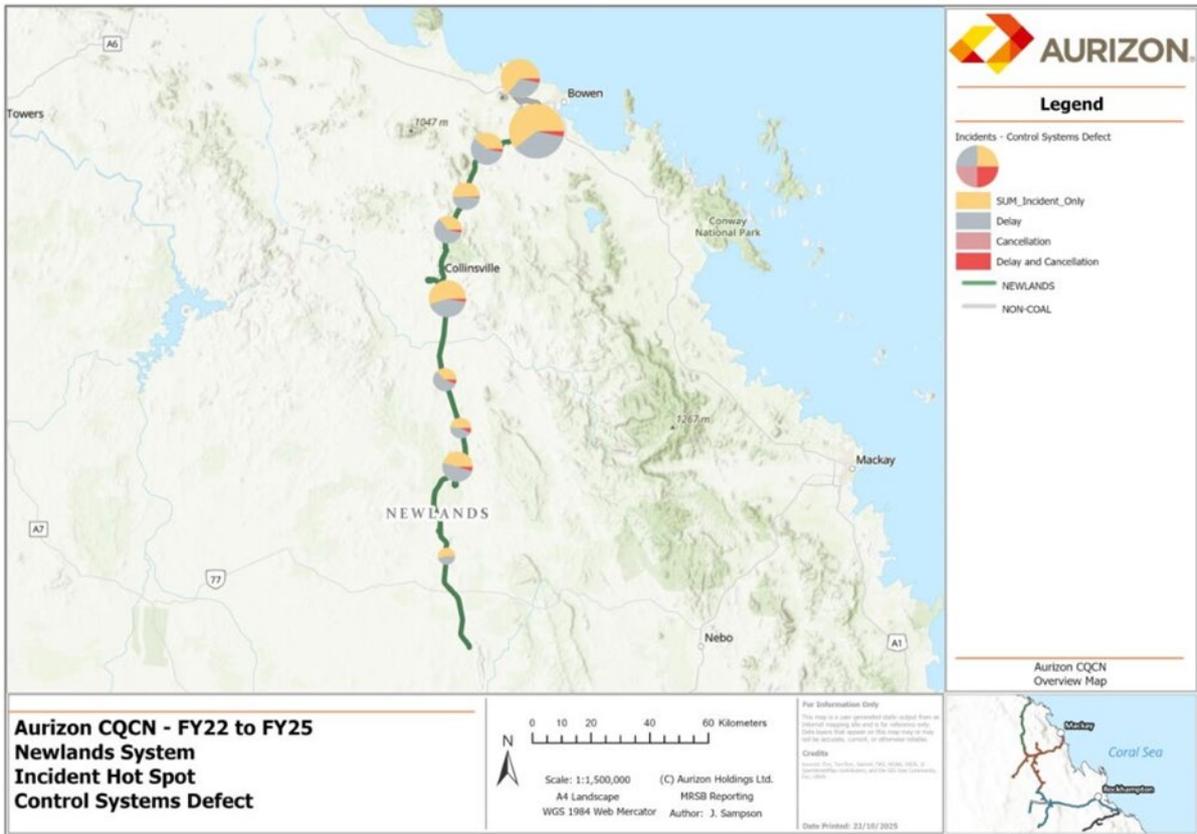


Figure 53 Control Systems Incidents Hotspots FY22-FY25 – Newlands System and GAPE

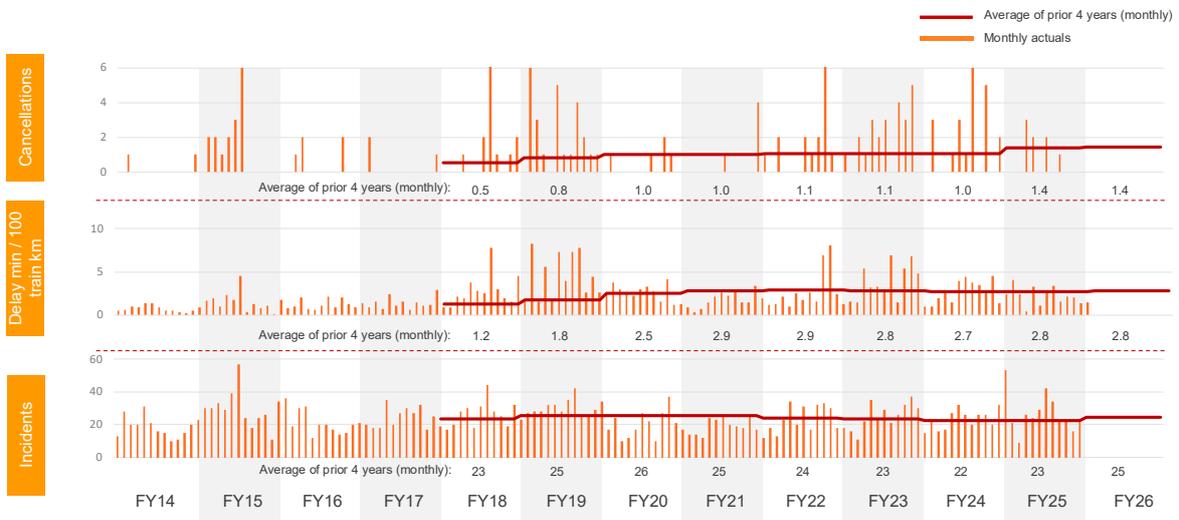


Figure 54 Control Systems Incidents 4-Year Average Trends – Newlands System and GAPE

Key trends relating to Control Systems have been identified:

- Control Systems incident numbers in Newlands have remained reasonably constant over time. There are greater fluctuations in the impact of incidents in terms of cancellations and delays.
- Control systems renewals are driven primarily by obsolescence and reaching end of life, rather than by performance. Obsolescence can also be driver of operational impact at failure, as replacement parts may not always be readily available.

- In Newlands, Signalling Power Assets have an average age of 15 years. With an estimated life of 15 – 20 years, many are coming to end of life requiring a steady annual program. In FY27, Power supply will be renewed at Kaili, Suttor Creek and Almoola among other locations.

6.2 Renewals Budget – Newlands System and GAPE

Aurizon Network’s FY27 Final Draft Proposal for the Newlands system provides for an Asset Renewals requirement of \$38.1m. The FY27 renewal program is proposing to renew between 0.21% and 3.97% of system assets by asset category and the average condition of Newlands system and GAPE assets included in the renewals budget (excluding reactive and strategic renewals) is 4.20 (very poor).

FY27 Final Draft Proposal is \$4.0m lower than the indicative forecast for FY27 included in the FY26 MRSB and \$6.3m higher than the FY26 Budget.

This section provides a comparison of the scope selected for FY27 against the FY26 Budget and the indicative FY27 forecast included in the FY26 MRSB. Commentary is also provided for key variation in costs compared to the FY26 Budget.

FY27 Renewal Scope Selected – Newlands System and GAPE

Figure 55 provides a visual representation of the distribution of Civil and Control Systems scope across the Newlands System and GAPE. While the majority of work is proposed for the mainline to Collinsville, work is also proposed for NCL (Newlands) branchlines and balloon loops.

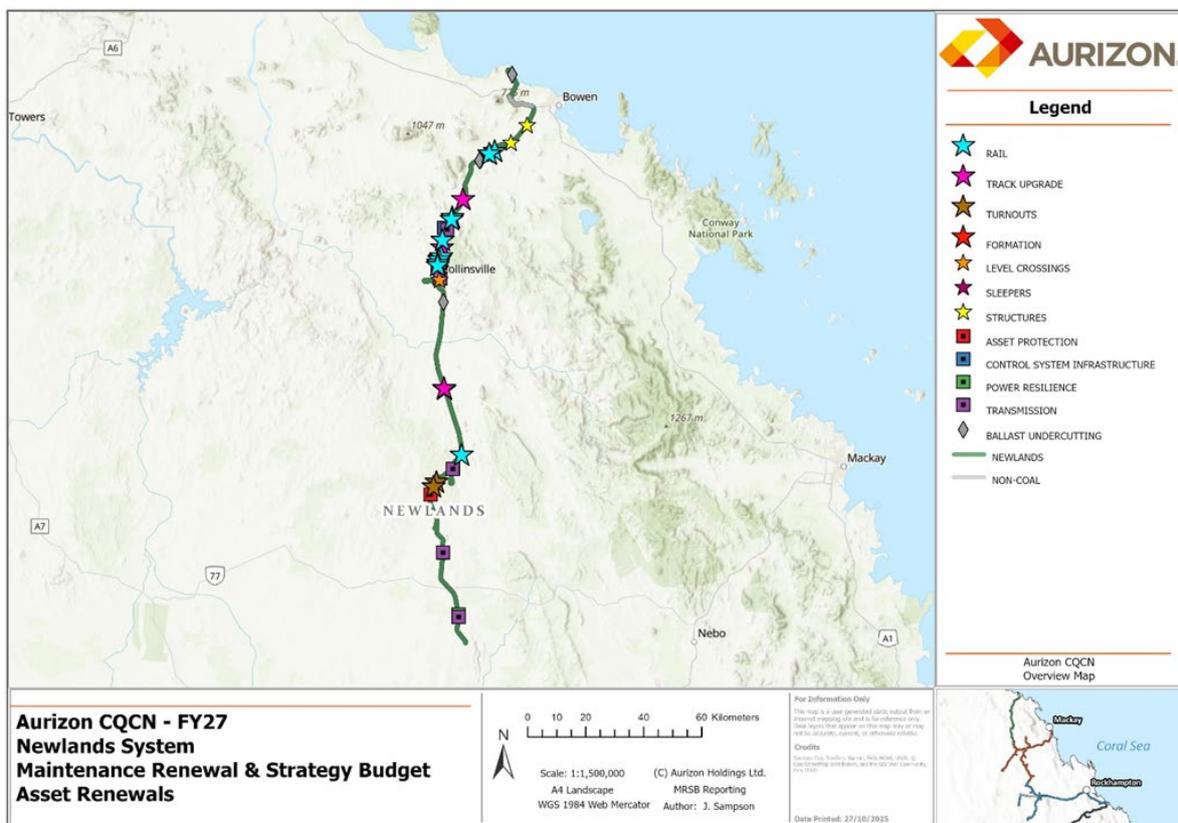


Figure 55 FY27 Civil Asset Renewal Locations – Newlands System and GAPE

The selection of scope each year is a product of multiple factors, depending on the asset class, that contribute to the assessment of condition and criticality. Information is provided on those elements of

the renewal program that are correlated with System performance trends in section 2.4 Improvements and Efficiencies. The commentary below informs the scope selection for:

- driving scope for integrated closures or for a large proportion of single line possessions to support the impact on available capacity
- scope which has a complex delivery or the mix of scope items results in a material change in costs compared to FY26, or otherwise is
- scope which is material for the asset class and is also a substantial part of the budget in total.

Rail/ Sleepers/ Track Upgrade

Proposed rail for renewals in FY27 will address 1,984 53kg standard carbon rail that has seen rapid failure rates or is of similar condition to those areas. FY27 includes larger sections of rail renewal through the Rail Renewals and Track Upgrade on the mainline from Abbott Point to Collinsville. All sites have a future condition rating above 3 (Poor) with an average of 3.33 (poor to very poor). The rail to be renewed in FY27 under Rail Renewals and Track Upgrade Renewals represents 3.8% of total rail km in the Newlands System and GAPE.

- Binbee to Amoola Rail Renewal (8.7 rail kms) represents 60% of the total rail scope. This scope has a future asset condition of 3.2 (poor). It has seen multiple defects through the curves and has reached its fatigue and wear limits.
- The Briaba to Amoola Track Upgrade (2.8 track km) represents 50% of the total track km for Track Upgrades and is driving scope in the March 104 hour closure. It has a future condition rating of 3.0 (poor) and has reached its wear and fatigue limits.
- The Kaili to Durraburra Track Upgrade (1.5 track km) represents c. 30% of the total track km for Track Upgrades and is driving scope in the September 106 hour closure. It has a future condition of 3.5 (poor to very poor) with severe sleeper fastenings corrosion due to the proximity to the coast and rail fatigue of the 1984 53kg standard carbon rail.

9,529 sleepers will be renewed in the Sleeper Renewal and Track Upgrade programs replacing fist clip and corrosion affected sleepers with concrete pandrol e-clip sleepers.

Turnout Renewals

The FY27 Turnout renewal program includes two turnouts at Leichardt Range. These turnouts are life expired and will be replaced with modern day equivalent to standardise and ensure safe operations. Both are full turnout renewals and have a future condition rating of 4 (very poor).

Ballast Cleaning

Mainline Ballast Cleaning is driving scope for the September 106 hour closure and planned single line possessions.

Nine kilometres of scope is planned between Armuna and Aberdeen with a mix of delivery through the RM902 and excavator undercutting. These sites have an average future condition rating of 3.6 (poor to very poor) and PVC of 30%. These locations have seen cancellations, TSR's and delays due to track alignment and ballast condition. Ballast undercutting will improve ballast condition and reinstate free drainage of track structure resulting in improved track alignment and stability.

Culvert Renewals

The FY27 Culvert renewal program includes 5 Reinforced Concrete Box Culvert across 4 sites. Each of the renewals involves the removal and replacement of existing concrete culverts. The existing culverts are aged and showing defects, severe cracking and/or pumping. The site at Armuna is an unreinforced pipe and shows signs of crushing under track. These structures have a future condition score of either 4 (poor) or 4.5 (poor to very poor).

Level Crossing Renewals

The FY27 Level Crossing Renewal program will see one planned renewal at Collinsville to McNaughton on the Bowen Development Road. It has a future condition of 3.6 (poor to very poor) and will be renewed in conjunction with the culvert renewal at Collinsville.

Formation Renewals

The FY27 Formation program will see 1 major renewal at Cockool with a future condition score of 3.5 (poor to very poor). Approximately 50% of the subgrade material is unsuitable and will need to be replaced as part of the formation renewal, subject to further Geotech testing.

Formation Renewal scope includes an allocation for reactive works for 0.12km, which will be drawn down on during FY27.

Control Systems Renewal

Safe Working:

- Asset Protection and Transmission and Data Renewals represent almost 70% of the costs of Control Systems in Newlands.
- Asset Protection scope will renew the Hot bearing detectors / Hot wheel detectors at Leichhardt range with a future condition of 4.0 (very poor).

Transmission & Data renewals scope is a mixture of different sub programs, however 80% of FY27 proposed renewals in the Newlands System and GAPE relates to:

- The renewal of a Digital Microwave Radio link at Collinsville that provides redundancy for optical fibre-based transmission or may be the sole communications pathway to some sites.
- Six telecommunications power supply renewals that provide backup feed to power equipment to the Operational Telecommunications Network.
- Routers, Switchers and firewalls of the Internet Protocol network that provides connectivity for devices that make up Below Rail Systems including Train Control Systems, Traction Scada System and the TETRA Radio System.

Table 56 provides a summary of Newlands System renewals as a proportion of total system assets, as well as the condition and criticality of the sites selected, noting condition is a measure of the asset reliability and criticality is a measure of the performance impact.

Table 56 FY27 Renewals Strategy - Newlands System and GAPE

Renewal Item	FY27 Proposed Scope (Total Newlands + GAPE)	FY27 Proposed Scope (GAPE)	FY27 No. of Sites	Avg Future Condition of Sites Selected	Avg Criticality of Sites Selected	Total System Assets	FY27 Scope % Total System Assets	Cost (\$m)
Civil Assets								35.3
Permanent Way								17.3
Rail Renewal (rail Km)	9.9	3.3	4	3.3	2.2	634	1.6	3.9
Track Upgrade (Track km)	9.3		8	3.3	2.9	317	2.9	11.7
Permanent Way – Other				5.0				0.3
Turnout Renewals	2	2	1	4.0	3.5	77	2.6	0.7
Turnout Components				5.0				0.6
Turnout Designs	2	1	1	4.0	4.1			0.1
Ballast Cleaning								6.0
Mainline Undercutting (track km)	7.6	7.6	1	3.6	2.8	317	2.8	3.7
Mainline Excavator Undercutting (track km)	1.4	0.4	1	4.1	3.5			1.2
Turnout Undercutting (site)	3	2	2	4.1	3.1	77	3.9	0.7
Bridge Rollout (m)						50		
Monumenting (site)				5.0				0.2
Ground Penetrating Radar				5.0				0.2
Structures								4.4
Bridges Design (site)	4		4	3.5	2.6			0.4
Culvert Design (site)	11		5	4.3	3.4			0.5
Culvert Renewals (site)	5		5	4.3	3.7	77	7.8	3.5

Renewal Item	FY27 Proposed Scope (Total Newlands + GAPE)	FY27 Proposed Scope (GAPE)	FY27 No. of Sites	Avg Future Condition of Sites Selected	Avg Criticality of Sites Selected	Total System Assets	FY27 Scope % Total System Assets	Cost (\$m)
Civil Renewals								7.6
Level Crossing Renewals (site)	1		1	3.6	3.0	96	1.0	1.9
Level Crossing Design (site)	2		2	3.5	3.0	96	2.1	0.1
Level Crossing Other				5.0				0.3
Formation Renewals (track km)	0.5		1	3.5	3.5	317	0.2	2.5
Formation Other				5.0				0.6
Access Points (site)	3		2	5.0	5.0			1.2
Access Roads (site)				5.0				0.2
Corridor Security Fencing (km)	12.7			5.0		646	2.0	0.7
Control Systems Assets								2.8
Safe Working Systems – Asset Protection (site/unit)	1	1	1	4.0	4.0			0.6
Safe Working Systems – Minor (site/unit)	3		2	4.5	4.0			0.1
Power Resilience	1	1	1	4.0	4.0			0.1
Transmission & Data Renewals (site/unit)	12	2	11	5.0	3.5			1.3
UTC DTC (site/unit)	-			5.0				0.3
Cyber Security	-		1	5.0	5.0			0.2
Total								38.1

Note: Figures may not add due to rounding.

FY27 Renewal Scope Variance Analysis – Newlands System and GAPE

Broadly, the variation in scope for each asset class compared to either the FY26 Budget or the indicative forecast for FY27 included in the FY26 MRSB is due to the review of asset condition and criticality as part of selecting scope for the FY27 Final Draft Proposal.

Compared to Indicative FY27 Forecast in FY26 MRSB (decrease of \$4.0m):

Civil (\$4.5m decrease) – Scope increases relating to rail renewals and track upgrade were partly offset by reductions in Bridge Rollout and structures. Maturing of cost estimates saw a reduction in rail renewal, track upgrade, mainline undercutting and culvert renewals compared to the forecast.

Control Systems (\$0.6m increase) – The change is predominantly due to an increase in Transmission & Data Renewal and Train Detection costs and an increase in cyber security scope, while included in FY26B had been omitted from the FY27 forecast.

Compared to FY26 Budget (increase of \$6.3m):

The increase in Civil is attributable to scope increases in rail renewals and track upgrade and cost increases in sleeper renewal, partly offset by cost reductions in track upgrade. Ballast Cleaning is broadly in line with FY26 Budget with a reduction in cost of mainline undercutting offset by an increase in mainline excavator undercutting scope.

For Control Systems, the mix of assets included in the renewal program has changed compared to the FY26 Budget with increases in Asset Protection and Transmission & Data Renewals scope offset by the reduction in estimates for Transmission and Data Renewals.

Table 57 is a summary of FY27 Newlands System and GAPE renewals compared to the FY26 Budget, at the program level.

Table 57 FY27 Renewals Budget - Newlands System and GAPE

Renewal Item	Assets Included	FY26 Approved Budget (\$m)	FY27 Proposed Budget (\$m)	FY26B v FY27B (\$m)
Civil Assets		29.1	35.3	6.3
Permanent Way	Rail, Track Upgrade, Sleepers, Turnouts	8.1	17.3	9.2
Ballast Cleaning	Mainline and Turnout Undercutting, Bridge Ballast, Monumenting and GPR	6.5	6.0	(0.4)
Structures	Bridges and Culverts	8.9	4.4	(4.5)
Civil Renewals	Level Crossings, Formation, Access Points, Slope Stability	5.6	7.6	2.0
Control Systems	Safe Working, Train Control and Detection, Interlocking, Telecoms, Power Resilience, Transmission	2.8	2.8	0.0
Total		31.8	38.1	6.3

Note: Figures may not add due to rounding.

Table 58 provides detail on the variance between the FY27 Final Draft Budget and the FY26 Budget.

Table 58 Cost Driver Movement Summary – Newlands System and GAPE

RIG Category	FY26B v FY27B	Comment
Civil Assets	\$6.3m	
Permanent Way	\$9.2m	Rail – larger scope in FY27 than FY26 but similar delivery costs. Track Upgrade – While the total cost increase in Track Upgrade is predominantly due to increased scope, the delivery methodology has grouped locations into larger site footprints to reduce site set up requirements delivering a 24% saving compared to FY26.
Ballast	(\$0.4m)	Mainline Undercutting – The overall program cost for FY27 is similar to FY26 however, the activity mix differs. In FY26, one large ballast undercutting site accounted for most of the ballast cost. In FY27, the mainline undercutter will operate across two smaller sites, with an increased use of excavator undercutting.
Structures	(\$4.5m)	Bridges and Culverts – No bridge scope in FY27. FY26 included a short-span bridge replacement and a bridge strengthening site. There is a much smaller number of physical renewals planned in FY27, and no large renewals. Culvert Estimate Assumptions – Year-to-year variation in the structures spend is driven by the mix of works. Procurement savings were achieved in FY25 and FY26, where initial MRSB estimates proved conservative compared to vendor pricing. The FY27 estimate reflects a more aggressive pricing assumption, including integrated culverts with a level crossing renewal at Collinsville.
Civil Renewals	\$2.0m	Reactive Works – Increase in allocations for rural fencing and rail access roads in FY27 against FY26 (\$1.1m & \$0.6m). Level Crossing Renewal - The level crossing at Collinsville will be renewed in conjunction with a culvert renewal and culvert grout fill elimination delivering c.\$200k in cost efficiencies.
Control Systems	\$0.0m	Transmission & Data Renewal – Program is \$1.0m lower in FY27 as there are no Tetra Radio enhancements. Asset Protection – Hot Bearing Detector to be delivered in FY27 (\$0.6m). No asset protection scope in FY26. Slight program scope and associated budget increases in Cyber Security, Power Resilience and UTC reactive works.

Renewals Opportunities and Risks – Newlands System and GAPE

Aurizon Network has identified risks and opportunities across each renewals category in the Newlands System and GAPE. It has then quantified the possible value impact of these risk or opportunities eventuating in the FY27 MRSB period and assigned an associated value range to the budget that should be considered as the opening forecast for the delivery of the identified scope.

On a weighted average of estimate class and program value, the FY27 renewals budget should be considered as a Class 3 estimate.

The upper and lower bounds of this value range are the extremes of all risks, or all opportunities realising in the MRSB period.

Table 59 Opportunity and Risk Range – Newlands System and GAPE

	\$m
FY27 Renewals Budget	\$38.1
Class of Estimate at Submission	Class 3: +/-10%

\$m	
Resulting Value Range	+3.8 / -\$3.8
FY27 Upper and Lower Value Range	Upper \$41.9 / Lower \$34.3

Figure 56 indicates each program of works plotted to represent the value of the program in FY27 and the class of estimate representing the value range at the point of MRSB submission.

Estimate Class

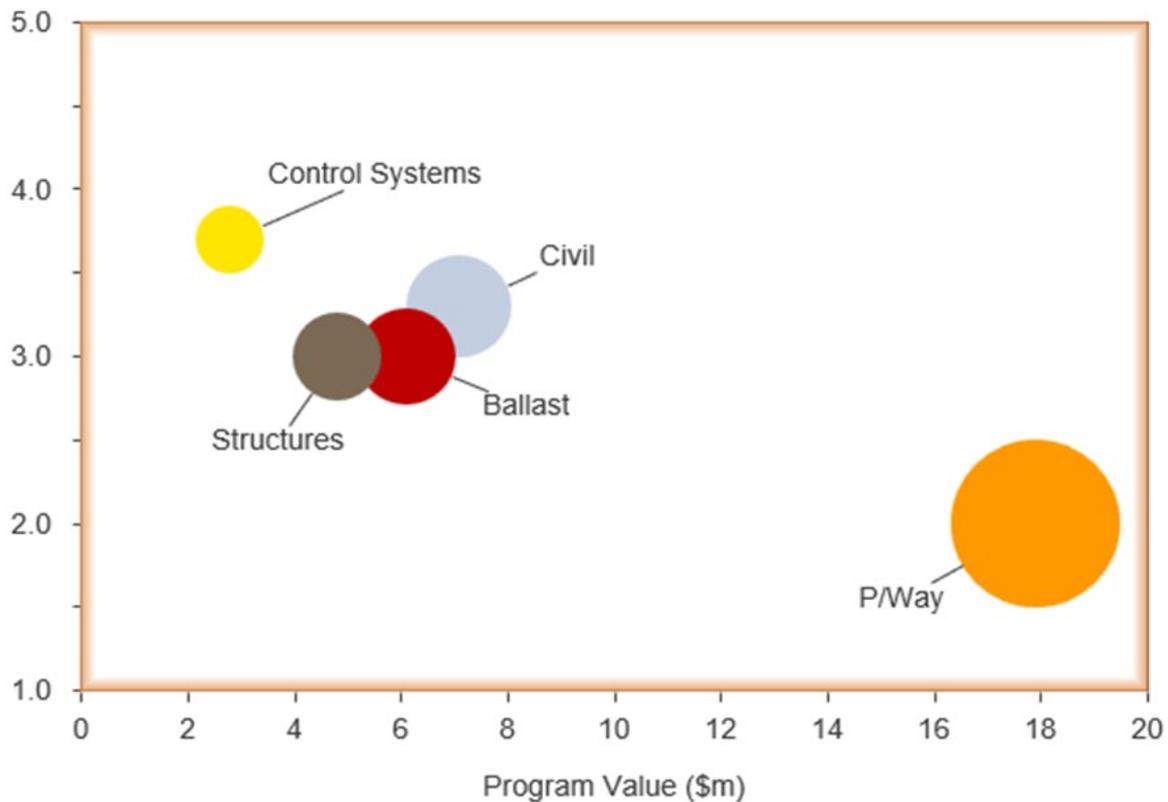


Figure 56 Program Value and Estimate Class – Newlands System and GAPE

Those programs that are typical Baseload scope attract a lower class of estimate that reflects the reduced level of expected delivery uncertainty. Those scope items that are Strategic in nature or at early stages of delivery planning, procurement or design at submission time attract a higher value range of estimate. Of note in FY27

- The Control Systems program is considered at Class 4. Given the heavy dependence on external vendors and that Aurizon competes in a global market for electrical components. The procurement elements of this program have a significant impact on the actual versus forecast project cost. Aurizon develop its estimate given either last known costs from prior years or estimated costs based on early vendor engagement. The procurement process for the program will be completed ahead of the FY27 period, the outcome of these processes will result in the estimate being better defined prior to FY27 delivery.
- The Ballast program is at Class 3. Actual return rate of ballast versus assumptions will be the main driver of variation both negative or positive in the year of delivery.
- The largest FY27 program in Newlands, Permanent Way (rail, sleepers, track upgrade and turnout) category is a Class 2 estimate given the practiced and repeated nature of this program.

- The delivery approach for the Track Upgrade and Rerail scopes at Durraburra-Kaili and Briaba-Collinsville is still in development due to the complexity of accessing the site within an embankment/cutting.

6.3 Maintenance Budget – Newlands System and GAPE

Aurizon Network has developed its Final Draft Maintenance Strategy and Budget for the Newlands System and GAPE having regard to all relevant matters outlined in clause 7A.11 of UT5, including the Maintenance Objectives. Aurizon Network considers its FY27 Final Draft Proposal provides an appropriate level of asset activity that will promote the safety, reliability and performance of the Newlands System and GAPE rail Infrastructure and seeking to deliver Committed Capacity.

Summary of Historic, Forecast and FY27 Maintenance Strategy and Budget – Newlands System and GAPE

Aurizon Network’s FY27 Final Draft Proposal for the Newlands System provides for a Direct Maintenance Cost Allowance of \$20.4m (excluding ballast undercutting plant depreciation) and assumes delivery of efficiencies identified in section 2.4 Improvements and Efficiencies. The budget is largely informed by escalation, fixed internal labour and indirect costs and historical activity levels, with General Track, Signalling & Telecoms and Rail Grinding activities representing ~76% of the system spend.

To maintain asset condition and reliability, a higher level of maintenance activity is expected to support the General Track Maintenance and Signalling and Telecoms programs. The FY27 Final Draft Budget is \$4.3m higher than the FY26 Budget.

Figure 57 and Figure 58 provide a summary of historic direct maintenance costs as well as the proposed direct maintenance cost allowance in respect of FY27.

To ensure comparability with prior periods, the direct maintenance costs shown in these figures exclude depreciation on ballast plant.

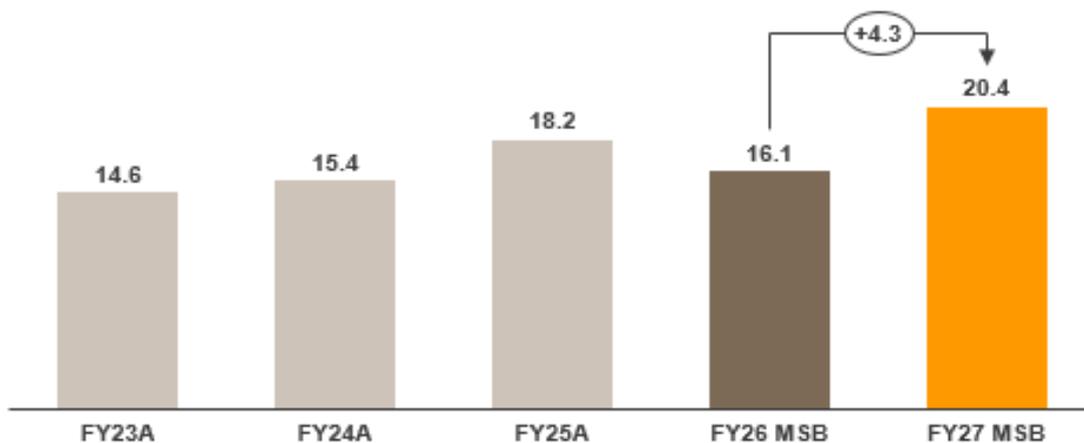


Figure 57 Historic Direct Maintenance Costs – Newlands System



Figure 58 Cost Driver Movement Breakdown – Newlands System

Table 60 below describes the movement in maintenance spend against the prior approved budget, by cost category.

Table 60 Cost Driver Movement Summary – Newlands System

Cost Category	Change	Comment
Non-Labour Escalation	\$0.3m	Increase driven by annual cost escalation on contractors, materials, plant, other consumables and rail grinding.
Labour and Indirect Costs	\$1.9m	<p>Labour and indirect cost included in the FY27 Final Draft Budget reflect the execution of the labour efficiency initiatives across all teams during FY26, to deliver on the target efficiencies overlayed in the FY26 Budget.</p> <p>Labour and Indirect costs increase against FY26 Budget is largely driven by:</p> <ul style="list-style-type: none"> Civil Infrastructure labour increased by \$1.1m, primarily due to the reprioritisation of internal labour resources to support corrective rail maintenance activity levels. Signalling & Telecoms labour increased by \$0.6m driven by increased maintenance activity within Newlands system, resulting in a higher proportion of labour cost allocation, with Control Systems North resources supporting both northern systems. Higher Track Resurfacing labour costs of \$0.2m which reflect increased allocation of the resurfacing team’s labour due to lower plant maintenance activities. <p>Movements isolated above include annual increases required under the Infrastructure Enterprise Agreement and other Staff Agreements.</p>
Contractors	\$0.9m	<p>Contractor cost increase against FY26 Budget is driven by:</p> <ul style="list-style-type: none"> General Track maintenance has increased by \$1.0m as result of the inclusion of targeted drainage program \$0.5m, additional external contractor spend following transition to granular herbicide vegetation management \$0.2m and additional contractor resources to support rail maintenance activity levels \$0.2m.
Material and Plant Usage	\$0.4m	<p>Material and Plant Usage decrease against FY26 Budget is driven by:</p> <ul style="list-style-type: none"> General Track maintenance \$0.3m driven by rail materials required to support corrective rail maintenance activity levels \$0.2m and internal plant costs to support ballast maintenance requirements \$0.1m. Lower Track Resurfacing materials and plant usage (\$0.1m) which reflects reduced maintenance consumables, along with a lower allocation of resurfacing team labour due to reduced plant maintenance activities.

Cost Category	Change	Comment
Rail Grinding	\$0.9m	Increase in cost driven by Mainline scope driven by the cyclical impact of the Durroburra–Carmichael Mine Junction 105km. Turnout scope increased following realignment of frequencies under individual FLOC identification.
Total	\$4.3m	

Note: Figures may not add due to rounding.

The proposed FY27 maintenance scope and budget for the Newlands System and GAPE is outlined in Table 61.

Table 61 FY27 Maintenance – Newlands System and GAPE

Maintenance Item	Scope Units	FY26 Budget Scope	FY26 Budget (\$m)	FY27 Budget Scope	FY27 Budget (\$m)	Variance (\$m)
Resurfacing			1.9		2.0	0.2
Mainline	Km	188	1.6	188	1.8	0.2
Turnout	Site	21	0.3	21	0.2	(0.0)
Rail Grinding			2.5		3.5	0.9
Mainline	Km	Redacted	2.2	Redacted	3.0	0.9
Turnout	Site	Redacted	0.3	Redacted	0.4	0.1
Level Crossing	Track LX	Redacted	0.0	Redacted	0.0	0.0
General Track Maintenance			5.1		7.4	2.3
General Track	Activity		4.7		6.4	1.7
Corridor Maintenance	Activity		0.3		0.8	0.5
Ultrasonic Testing	Km	2,254	0.2	2,251	0.2	0.1
Signalling and Telecoms			3.8		4.5	0.7
Structures and Facilities			1.6		1.6	0.0
Trackside Systems			0.4		0.4	0.1
Other Civil Maintenance			0.3		0.2	(0.0)
Other General Maintenance			0.5		0.7	0.2
Sub-Total			16.1		20.4	4.3
Ballast Undercutting Plant Depreciation			0.3		0.3	(0.0)
Total Direct Maintenance Costs			16.4		20.7	4.3
Non-Coal Allocation			(0.1)		0.0	0.1
Total			16.3		20.7	4.4

Note: Figures may not add due to rounding.

Material movements in spend by maintenance category against the prior approved budget are also outlined in Table 62.

Table 62 Cost Movements by RIG Category – Newlands System and GAPE

RIG Category	FY26B v FY27V	Comment
Resurfacing	\$0.2m	Increase against the FY26 Budget reflects higher labour allocations, partially offset by lower resurfacing plant costs and reduced plant maintenance labour. Scope remains unchanged from FY26.
Rail Grinding	\$0.9m	Increase in cost driven by Mainline scope driven by the cyclical impact of the Durroburra–Carmichael Mine Junction 105km. Turnout scope increased following realignment of frequencies under individual FLOC identification.
General Track Maintenance	\$2.3m	<p>Increase compared to FY26 Budget driven by the following changes:</p> <ul style="list-style-type: none"> • Inclusion of contractor costs to execute 3 targeted corridor drainage sites, with very poor drainage condition. • Additional internal labour support, contractor support and rail materials required to support rail maintenance activity levels. • Increase in external contractor spend as a result of the transition to granular herbicide vegetation management. <p>Please refer to Drivers of Change in Maintenance Budgeting Approach – General Track in Appendix 6 – Works End to End Process for additional information on budget assumptions for rail maintenance, targeted drainage and vegetation management activities.</p>
Signalling and Telecommunications	\$0.7m	Increase in control systems labour costs is driven by an uplift in maintenance activity, based on increased corrective activity. This has resulted in a system mix reallocation, with lower costs allocated to Goonyella system, with work performed by the same labour resources.
Trackside Systems	\$0.1m	Minor uplift driven by escalation.
Other Civil Maintenance	\$0.1m	Remains in line with prior year.
Other General Maintenance	\$0.1m	Broadly in line with prior year.
Ballast Plant Depreciation	\$0.0m	Ballast undercutting plant depreciation in broadly in line with the FY26B, with the allocation between systems based on the number of days that the ballast plant is expected to be operating in the Newlands system in FY27.

For additional information on the budgeting approach and assumptions, please refer to Budget Setting and Procurement in Appendix 6 – Works End to End Process.

Figure 59 sets out a summary of historic and budgeted direct maintenance costs by maintenance category. To ensure comparability between periods, the direct maintenance costs presented in these figures exclude depreciation on ballast undercutting plant.

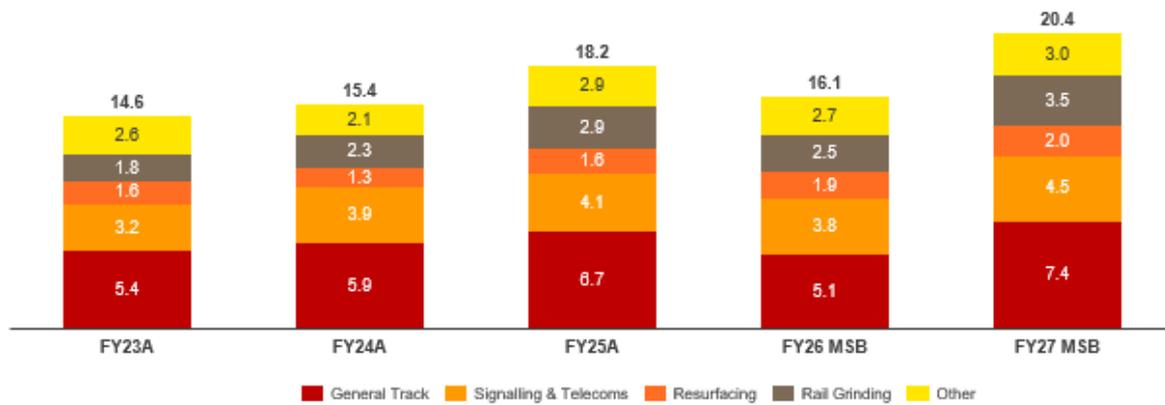


Figure 59 Direct Maintenance Costs by Category – Newlands System and GAPE

Figure 60 sets out a summary of historic and budgeted direct maintenance costs by activity type.

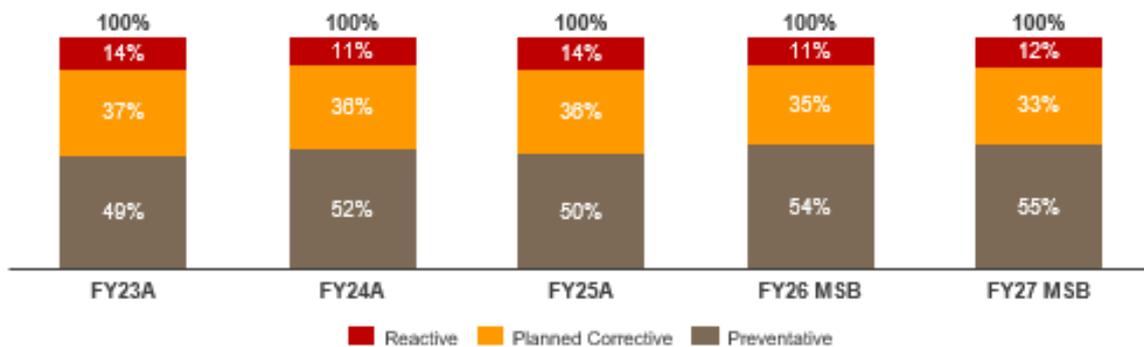


Figure 60 Direct Maintenance Costs by Activity Type – Newlands System and GAPE

6.4 Integrated Closure Plan – Newlands System and GAPE

Aurizon Network has developed an access plan to deliver the required scope for the Newlands System while balancing cost and access. Closure frequencies remain aligned with previous years, with one scheduled in each half and timed to coincide with port outages.

FY27 will see an increase in integrated closure hours however aligns with port outages (210 Integrated Closure hours and 140 single-line hours). Total closure hours have increased YoY however timing remains fully aligned with port outages.

Table 63 summarises Aurizon Network’s approach, incorporating customer and supply chain feedback received through development of the FY27 MRSB.

Table 63 FY27 Supply Chain Considerations – Newlands System and GAPE

Opportunity	Details
Optimising for Throughput	<ul style="list-style-type: none"> • Early staged handback of integrated closures (e.g. cross system and Newlands closures). • Closures loaded to resource and safe work integration capacity, with single line transitions used where possible to reduce total integrated closure durations (e.g. height limited machinery). • High impact scope prioritised for closures to minimise single line impact including high impact BCM Scope locations.

Opportunity	Details
	<ul style="list-style-type: none"> Aligned single line scope between disciplines where possible (e.g. RM902 plus bridge rollout plus rerail). Closure planning considers impacts on cross-system traffic, particularly as the network continues to operate at high-capacity utilisation.
Supply Chain Alignment	<ul style="list-style-type: none"> Newlands closure frequencies remain consistent with FY26, taking full advantage of 2 x 108-hour port closures. Aligned with Queensland Rail closures on the North Coast Line (NCL) to reduce cumulative impacts (involving changed team roster pattern).
Closure Timing	<ul style="list-style-type: none"> Aligned with NQXT in-loading shutdown forecasts as part of early MRSB engagement and development phases. Closures planned to avoid public holidays, weekends (where practical). Maintained one major closure to a single roster block to maximise internal resources. Considerations for regional events and significant sporting events to assist accommodation availability for crews. Higher ramp up of resurfacing machines within closures, allowing more work to be planned.
Program Staging	<ul style="list-style-type: none"> Avoiding high risk scope in the wet season where possible. Turnout undercutting packaged at stations for efficiency and to reset to design.
Integrated Closure Summary	<ul style="list-style-type: none"> 2 closures planned for FY27. Includes system and branch line closures. High network capacity utilisation in the Newlands system means network availability outside of Integrated Closures is maximised by: <ul style="list-style-type: none"> packaging renewal activity and maximising corrective maintenance into available Integrated Closure windows packaging and aligning corrective maintenance with moving products (CETS) shadows and other supply chain participant's outages, and incorporating the impact of activity affecting cross-system (GAPE) traffic.

Table 64 Planned Integrated Closures and Branch Closures – Newlands System and GAPE

FY27 Integrated System Closures													
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
Location			Ports HAV						Ports HAV				
Hours	0	0	106	0	0	0	0	0	104	0	0	0	210

Table 65 Driving Path Scope – Newlands System and GAPE

Closure	Driving Path Activities	Location
September 106-hour	RM902 Ballas Renewal	Armuna – Aberdeen
	Track Upgrade	Durraburra – Kaili
	Culvert and Level Crossing	Collinsville
	Formation	Cockkool
March 104 hours	Track Upgrade	Briaba – Collinsville

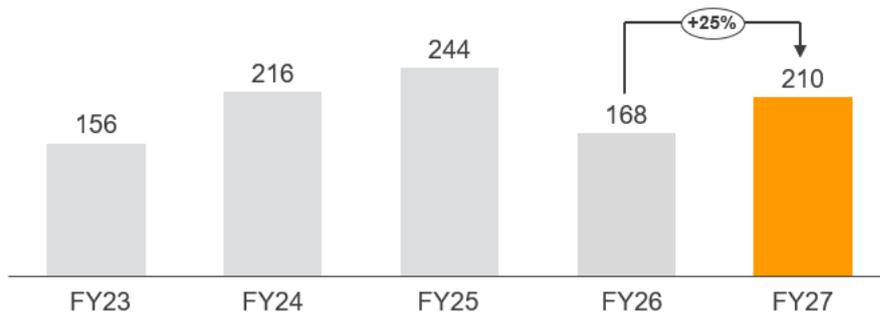


Figure 61 Trend of Integrated System Closure Hours (Mainline Only) FY23-FY27 – Newlands System and GAPE

6.5 Four-Year Forecasts – Newlands System and GAPE

This section outlines Aurizon Network’s indicative cost forecasts for Maintenance and Asset Renewal activity in each Coal System. Information is provided for this FY27 Final Draft Proposal plus a forecast period of four years (FY28 – FY31).

The FY28 – FY31 indicative cost forecasts are provided to increase transparency on forward looking asset renewals and maintenance expenditure. It is a high-level estimate based on currently available information. The outer year forecasts are predominantly based on the age of the asset and the strategic annual scope target to manage known future resourcing and access constraints where a significant number of assets are forecast to require renewal in similar periods (referred to as the ‘bow wave’ of required investment). For this reason, in a number of circumstances the number of renewals has been identified in each system and the specific site will be identified as further information about asset condition, viability of alternate multi-year asset management approaches, engineering designs, the access footprint and resourcing available to deliver the renewals become available.

Each future forecast considers the re-phasing of scope from year to year where scope has been deferred into future years or future scope has been brought forward.

Table 66 FY27 Plus Four-Year Maintenance Cost Forecast (Nominal \$m) – Newlands System and GAPE

System Maintenance	FY27	FY28	FY29	FY30	FY31
Resurfacing	2.0	2.1	2.1	2.2	2.2
Rail Grinding	3.5	2.6	3.7	2.4	3.1
General Track Maintenance	7.4	7.7	7.9	8.2	8.4
Structures and Facilities Maintenance	1.6	1.1	1.3	1.8	1.8
Other Civil Maintenance	0.2	0.2	0.2	0.2	0.2
Signalling and Telecommunications Maintenance	4.5	4.6	4.8	4.9	5.1
Trackside Systems Maintenance	0.4	0.4	0.4	0.5	0.5
Other General Maintenance	0.7	0.7	0.8	0.8	0.8
Total Direct Maintenance Costs (excl. Ballast Undercutting Plant Depreciation)	20.4	19.5	21.3	20.9	22.2

System Maintenance	FY27	FY28	FY29	FY30	FY31
Ballast Undercutting Plant Depreciation	0.3	0.3	0.3	0.3	0.3
Total Direct Maintenance Costs	20.7	19.8	21.6	21.2	22.5

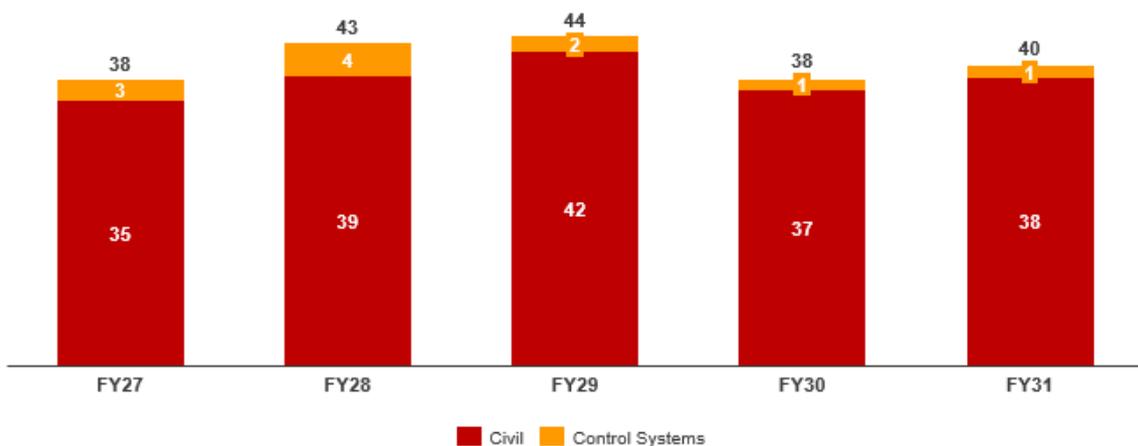
Notes:

- 3.2% escalation has been included for FY28 onwards.
- Rail Grinding forecast includes cost escalation and scope variation year on year driven by anticipated grinding requirements and stable management of rail asset condition. Future estimates are indicative only and may be subject to change and will be iterated in future MRSB submissions for RIG review and approval.
- General Track Maintenance forecast reflects a continued level of rail maintenance activity and targeted drainage works.

Table 67 FY27 Plus Four-Year Renewals Cost Forecast (Nominal \$m) – Newlands System and GAPE

Renewals Item	Asset Included	FY27	FY28	FY29	FY30	FY31
Civil Assets		35.3	38.6	41.7	36.7	38.4
Permanent Way	Rail, Track, Sleeper, Turnouts	17.3	17.7	17.8	15.0	15.7
Ballast Cleaning	Mainline and Turnout Undercutting, Bridge Ballast	6.0	7.4	8.1	7.9	8.2
Structures	Culverts, Bridges	4.4	8.5	10.5	9.2	9.6
Civil Renewals	Formation, Level Crossings, Access Points	7.6	5.1	5.3	4.6	4.8
Control Systems	Safe Working, Train Control and Detection, Interlocking, Telecoms, Power Resilience, Transmission, Optical Fibre	2.8	4.4	2.1	1.4	1.5
Total		38.1	43.0	43.8	38.2	39.8

Note: 4.4% escalation has been included.



Note: Four-year forecast is indicative only and does not account for access, resource considerations, detailed design and associated costings.

Figure 62 FY27 Plus Four-Year Renewals Cost by Scope Category (Nominal \$m) – Newlands System and GAPE

Four-Year Forecast Commentary – Newlands System and GAPE

Civil

The Ballast Cleaning program is 20% of the Civil program across the four-year forecast period. It includes on average 7km of ballast undercutting and 2 turnouts.

The renewal of Permanent Way assets is approximately 45% of the civil program and includes an average of 1600 sleepers, 8 rail km, 4 and 5 track km (both sleepers and rail) per year and 5 turnout or turnout component renewals over the period.

Structures include the renewal of an average of 7 culverts and 3 bridges per year.

The majority of costs in the civil renewal program are attributable to 0.5km of Formation, corridor fencing and security and access points and roads.

Control Systems

Safe Working Systems – Asset Protection, Transmission and Data Renewals and Universal train control renewals represent approximately 90% of the Control Systems four-year forecast.

Safe Working Systems – Asset Protection includes the replacement of 4 hot bearing detector/ hot wheel detectors over the 4-year period.

Renewals for Transmission and Data predominantly include digital microwave radio links, routers, switches and firewalls, generators and power supply.

Appendix 1 – Renewal Scope Detail Report

Explanatory Notes

The Renewal Scope Detail Report for each system is provided in this appendix and also as a Power BI report accessible to all users that have access to the Aurizon Network Customer Portal.

The Renewal Scope Detail Report includes four filters:

- System
- Scope Type
- Asset Class
- RIG Category.

For each selection made, the proportion of program by investment type will be calculated in the boxes on the right.

The report data can be extracted by hovering the cursor to the top right of the table and selection more options from the ‘...’ icon.

FY27 Renewal Scope Detail Report

Aurizon Network Performance Reporting
05319009 - FY27 Renewal Scope Detail Report

MRSB Renewal Scope for the Central Queensland Coal Network

System	MRSB Type	Asset Class	RIG Table Category	Program	Program 2	Scope Subset	Scope Quantity	Scope Unit	Start Station	Future Condition	Criticality Index	CRA Index
Blackwater	FUTURE SCOPE	CIVIL	Access Points & Rds	ACCESS POINTS	IFC	DESIGN	1.00	SITE	BURNGRIVE	10.00	10.00	100.00
Blackwater	FUTURE SCOPE	CIVIL	Access Points & Rds	ACCESS POINTS	IFP	DESIGN	1.00	SITE	ROCKLANDS	10.00	10.00	100.00
Blackwater	FUTURE SCOPE	CIVIL	Access Points & Rds	ACCESS POINTS	IFP	DESIGN	1.00	SITE	ROCKLANDS	10.00	10.00	100.00
Blackwater	REACTIVE RENEWALS	CIVIL	Access Points & Rds	ACCESS POINTS		REACTIVE WORKS	0.00	LUMPSUM		5.00	5.00	25.00
Blackwater	BASELOAD	CIVIL	Access Points & Rds	ACCESS POINTS	RENEWAL	RENEWAL	1.00	SITE	RAGLAN	10.00	10.00	100.00
Blackwater	REACTIVE RENEWALS	CIVIL	Access Points & Rds	ACCESS ROADS		REACTIVE WORKS	0.00	LUMPSUM		5.00	5.00	25.00
Blackwater	FUTURE SCOPE	CONTROL SYSTEMS	Safe Working Systems - Asset Protection	ASSET PROTECTION	MAINLINE PANCAM	DESIGN	1.00	SITE	KALAPA	5.00	4.00	20.00
Blackwater	FUTURE SCOPE	CONTROL SYSTEMS	Safe Working Systems - Asset Protection	ASSET PROTECTION	WEIGHBRIDGE	DESIGN	1.00	UNIT	KALAPA	4.00	4.00	16.00
Blackwater	BASELOAD	CONTROL SYSTEMS	Safe Working Systems - Asset Protection	ASSET PROTECTION	WEIGHBRIDGE	RENEWAL	1.00	UNIT	BOORGOON	4.00	4.80	19.20
Blackwater	BASELOAD	CONTROL SYSTEMS	Safe Working Systems - Asset Protection	ASSET PROTECTION	WILD	RENEWAL	1.00	UNIT	KALAPA	4.00	4.00	16.00
Blackwater	REACTIVE RENEWALS	CIVIL	Mainline Excavator Undercutting - C14	BALLAST UNDERCUTTING	MAINLINE C14	REACTIVE WORKS	2.27	KM		5.00	5.00	25.00
Blackwater	REACTIVE RENEWALS	CIVIL	Turnout Undercutting - C13	BALLAST UNDERCUTTING	TURNOUT C13	REACTIVE WORKS	4.00	TURNOUT		5.00	5.00	25.00
Blackwater	BASELOAD	CIVIL	Mainline Undercutting - C01	BALLAST UNDERCUTTING	MAINLINE C01	RENEWAL	8.43	KM	ALDOGA	4.50	4.10	18.45



Aurizon Commercial in Confidence

Last Refreshed at: 27/11/2025 14:47

Figure 63 Screenshot of FY27 Renewal Scope Detail Report

Provided as attachments are exports of the Renewal Scope Detail Report for each system.

Appendix 2 – Renewal and Maintenance Strategies by Asset Class

Assets for Renewal and Maintenance are presented in the MRSB in the classes and products as per Table 68.

Table 68 Asset Classes

Class	Renewal Products	Maintenance Products
Permanent Way	Rail, Sleepers, Turnouts, Track Upgrade	Resurfacing, Rail Grinding, General Track Maintenance, Track Inspection, Ultrasonic Testing, Friction Management
Ballast	Mainline Ballast Cleaning/Renewal, Turnouts Ballast Renewal, Bridge Ballast Renewal	Maintenance Ballast, Ballast Minor Undercutting
Structures	Bridges, Culverts	Structures Preventive, Structures Corrective
Civil Asset Renewals	Formation, Level Crossings, Access Roads, Fencing, Access Points, Corridor Drainage, Cuttings and Embankments, Stow & Crew Change Infrastructure	General Track Maintenance, Other Civil Maintenance
Control Systems Assets	Safe Working (Asset Protection, Interlockings, Train Detection, Train Detection, Minor), Power Resilience, Telecommunications Assets, Transmission Data & Renewal, UTC/DTC Systems Upgrades, Other Control Systems Renewals	Signalling Corrective, Signalling Preventive, Telecoms Corrective, Telecoms Preventive
Electrical Assets	Overhead Line Equipment (OHLE), Feeder Stations, Autotransformers, SCADA systems	OHLE Corrective, OHLE Preventive, Traction Corrective, Traction Preventive

This appendix describes the Asset Management Strategies applied to each of these products. This is a summary of information contained in the Network Asset Maintenance and Renewal Policy (AMRP).

The AMRP is reviewed on an annual basis to incorporate changes in strategic approach, enhancements in process or changes in asset policy.

Permanent Way

Permanent Way assets in a railway refer to the infrastructure that makes up the tracks, including rail, sleepers, turnouts, and friction management equipment. These assets are also the connection point between rollingstock and the below rail assets.

If efficient to do so, rail and sleeper products may be combined for renewal concurrently. Combined works are referred to as 'Track Upgrade' within the MRSB.

Effective maintenance and renewal of the Permanent Way assets provide the following benefits to the Coal supply chain.

- **Asset Reliability** – Reduces network delays associated with unplanned asset activity. Asset components such as rail, sleepers and turnouts have a low likelihood of failure in a new state and require minimal unplanned maintenance once renewed.
- **Capacity** – Renewing in a planned manner within an identified closure pattern avoids unplanned outages and associated throughput losses. Managing defects via temporary speed restrictions reduces the risk of a more severe operational impact resulting from an unplanned outage ahead of planned maintenance.
- **Safety**- Reduces derailment risk.

Rail

Given rail is a crucial component in the railway, it is manufactured to exacting standards suited to the operating environment, ensuring durability and safety.

Rail is managed through its asset life by undertaking patrol inspections, geometry inspections, ultrasonic inspections, rail reprofiling via rail grinding, alignment correction via resurfacing, lubrication on its curves and management of temperature-driven steel expansion and contraction through effective rail stress management.

Table 69 Rail

Item	Description
Typical Description	<ul style="list-style-type: none"> • Mix of rail types across the CQCN ranging from 47kg to 60kg • Current standard is 60kg through head-hardened rail • 110m continuous welded lengths joined by aluminothermic welds in field or Insulated Rail Joints (IRJ)
Maintenance	<p>Rail Inspection – Track inspections, ultrasonic testing, track geometry recording, and visual inspections are utilised to identify rail wear and rail faults. The severity of the fault drives the timing of correction.</p> <p>Friction Management – Lubrication of track on straights and curves and maintenance. That is, filling of any lubrication systems or devices, and testing and maintenance of remote monitored lubricators and software licences.</p> <p>Rail Break Repair – The immediate action after a rail break. Depending on the location and severity of the break this will typically be a temporary correction (plug rail insertion, break plating) to allow operations to resume ahead of a planned further repair or renewal. This includes weld and IRJ breaks.</p> <p>Rail Joint Corrective Maintenance – Maintenance of a rail joint including flash-butt welding or thermite welding of mechanical joints, grinding to remove metal flow from an IRJ, bolt and fish plate maintenance of mechanical joints, and lifting and lining joints (manual/mechanised spot tamping).</p> <p>Rail Stress Management – Ensuring rail is at the correct stress-free temperature to accommodate both rail expansion associated with summer heat and rail contraction associated with cooler winter periods. Uncontrolled rail expansion results in track misalignments or buckles in summer and rail breaks in winter.</p> <p>Rail Grinding – Removes micro cracks and small surface defects from the rail surface and restores the rail profile to minimise wheel/rail contact stresses and assist rollingstock steerability. Planned maintenance activities include rail grinding, track resurfacing and inspections to measure track profile and geometry compliance.</p>
Asset Renewal	Rail reaches the end of its life by either:

Item	Description
	<ul style="list-style-type: none"> • Rail Fatigue – The failure mechanism from an increase in rail defects which are caused through millions of wheel cycles over the rail (analogous to continuous bending of a paperclip). Rail fatigue generally only manifests itself in straight track or very large radius curves where the rail has been in service for significant periods of time. • Rail Wear – Progressive loss of steel in the rail head caused by the very high lateral forces under train operations and preventive grinding. The rail wears to the point where it is not sufficiently strong enough to sustain the heavy axle loads; rail wear generally only manifests itself in curved track. The sharper (i.e. tighter) the curve, the higher the wear rate. • Rail Corrosion – Corrosion on the rail results in thinning or reduction of the rail section and instability of the rail. This introduces a potential risk of displacement and large stresses that could lead to rail failure. Corrosion is difficult to manage, especially in highly corrosive environments such as loadouts where the rail contacts coal which traps moisture. These locations are difficult to visually inspect and assess therefore require proactive replacement to reduce failure.
Typical Requirements	Scope <p>There is over 5,400km of rail across the CQCN. The volume and weight of rail traffic is measured in Million Gross Tonnes (MGT). MGT is the key driver of rail wear and fatigue. Aurizon Network uses predictive modelling for the identification of rail wear and has identified an average amount of rail km to be completed each year for fatigue and corroded rail. A large proportion of fatigued rail is 53kg and 60kg standard carbon rail installed in the 1980s and 1990s. This rail is now reaching the end of its life and is being replaced progressively to avoid a bow wave of renewals and operational impacts if renewed at the same time. Across the CQCN, 119 rail km is sought to be replaced each year to manage wear, fatigue and corrosion.</p>
Supply Chain Risks being Managed	<p>The effective management of rail prevents issues such as worn rail and broken rails leading to delays and cancellations to rollingstock while repairs are affected, or the more severe event such as derailments which are a major incident that stops the supply chain until rollingstock is recovered and rail infrastructure replaced or restored.</p> <p>The predominate failure of a rail break is a square or angular sudden rupture, transverse separation of the head, web and foot of the rail, which results in a discontinuity of the track structure. It includes broken rail, failed or broken welds, broken fishplates in mechanical / glued insulated joints or where at least all bolts are missing or broken on one side of a mechanical / glued insulated joint.</p> <p>These types of failures usually occur at a weak point in the rail during very cold weather and are often caused by concentrated loadings (overstressing) from rollingstock or other track maintenance operations. Aurizon Network does not have a predictive tool to forecast defects requiring corrective maintenance and uses an average of the prior three years unless this is not reflective of current defect trends.</p> <p>Rail is managed to minimise the risk of rail breaks resulting in cancellations and delays to the supply chain.</p>

Sleepers

Sleepers perform the function of holding the rails to correct gauge and distributing the loads imposed on the rails to the ballast and critically, providing lateral stability to track. Other than some sidings, low traffic spurs and mine loops, all sleepers in the CQCN are concrete and of varying size and capacity.

Table 70 Sleepers

Item	Description
Typical Description	<ul style="list-style-type: none"> • 28 tonne axle limit full depth reinforced concrete sleepers • 685mm sleeper spacing • Pandrol e-clip sleeper fastenings

Item	Description
Maintenance	<ul style="list-style-type: none"> Galvanised e-clips in coastal and high corrosion locations <p>Sleeper Cluster Management – The repair of sleepers with defects in a row or cluster which may require spot insertion of sleepers, reborring, regauging, replating, respacing and/or spot replacement of pads, insulators and fasteners to rectify the defects and remove the cluster from the track.</p> <p>Sleeper Inspection – Sleepers are visually inspected, and defects are reported. The condition of all fasteners including clips, shoulders, pads and insulators and any damage are also reported during inspections. In addition to the visual condition inspection, timber sleepers are also tested at required intervals to check for defects that render the sleeper ineffective.</p> <p>Spot Tamping – Involves localised top and line restoration using manual or mechanised assisted processes to realign the sleepers within the track alignment.</p> <p>Track Geometry Recording – Measuring the track geometry parameters for sleeper defects. For example, gauge issues may be the result of missing fasteners or defective pads and insulators.</p>
Asset Renewal	<p>Sleeper renewal is the standalone replacement of sleepers in a section of track. The life of a sleeper is affected by many factors, including the design loading, quality and type of the sleeper, density of the traffic, curvature (i.e., the amount of curves in the track), maintenance conditions and the effect of derailments or other damage. Sleepers require replacement where a group or cluster is classed as defective.</p> <p>Sleepers are renewed via the Sleeper Laying Machine, Track Laying Machine or inserted using other on and off-track machines depending on the quantity being replaced and their location.</p> <p>Sleepers have a design life of 40 – 50 years for concrete (depending on type), 40 years for steel and 12 years for timber.</p>
Typical Scope Requirements	<p>There are over 4 million sleepers in the CQCN. The sleepers renewed each year are selected due to age and condition and the ability of the sleeper section to perform required functions.</p> <p>The FY26 – FY29 renewal program will see the replacement of concrete fist sleepers inserted in the 1980s in Blackwater, Moura and Goonyella, with concrete Pandrol e-clip sleepers and steel sleepers with concrete Pandrol e-clip sleepers on the Gordonstone Mine Spur.</p> <p>Sleeper renewal is a baseload scope item, with the level of renewals expected to fluctuate over the coming periods dependant on the location of aged sleepers being renewed.</p>
Supply Chain Risks being Managed	<p>Sleepers distribute the load of trains evenly to the ballast and formation. Worn or decayed sleepers can compromise this function, leading to uneven load distribution and resulting in rail wear and increased loading on ballast and formation. The effective management of sleepers will ensure sleeper condition does not deteriorate to a level where it becomes poor and leads to misalignment and deformation of tracks. This can lead to derailments or other incidents, causing cancellations and/or delays to the supply chain. Regular inspection, maintenance and replacement of sleepers ensures the track remains in optimal condition, minimising the risk of track failures.</p>

Turnouts

A turnout (also known as Switches or Points & Crossings) joins two tracks and enables a train to move from one track to the other or exit the mainline to a spur, siding or loop. Depending on the direction, a turnout is classified as right hand or left hand. When turnouts are provided at both ends of a connection between two tracks, the arrangement is known as a crossover.

A complete turnout consists of switch assembly, crossing assembly, all closure rails, insulated rail joints, base plates, any special plates and pads, blocks, guard rail assemblies, fasteners, rodding, and bearer set (sleepers).

Table 71 Turnouts

Item	Description
Typical Description	<p>Due to the arrangement of track, size of rail and required turnout speed, there are many variations of turnouts across the CQCN. These assets are designed to suit the requirements of each site and whilst endeavours are underway to rationalise turnout configurations, there are few typical arrangements.</p> <p>Turnouts are graded by three parameters:</p> <ul style="list-style-type: none"> • Rail size – The weight of the rail within the turnout (e.g., 60 kg, with 41 kg being smallest and 60 kg largest); • Crossing rate – The angle of divergence that defines the speed through the turnout (e.g., 1 in 12, with 1 in 7 being smallest and 1 in 25 being largest); and • Crossing type – The specific design of a crossing, with fabricated being the lowest standard, rail bound manganese next and Swing Nose Crossing the highest.
Maintenance	<p>Turnout Maintenance – Minor maintenance on turnouts including minor repairs of components, rail and jewellery, maintenance welding, chair lubrication, manual spot tie replacement (< 10 sleepers), manual top and line, manual (hand) grinding and any signalling and traction support to undertake the maintenance activities.</p> <p>Turnout Inspections – Scheduled and unscheduled inspections of turnouts to determine condition and any defects in the turnout.</p> <p>Turnout Resurfacing – Mechanised resurfacing carried out on turnouts involving mechanical lifting, lining and tamping of the turnout with a Tamper Liner, followed by ballast profiling using a Ballast Regulator and includes the associated activities such as signalling support.</p> <p>Turnout Grinding – High production mechanised process of establishment and maintenance of rail head profile on turnouts. This includes the removal and reinstatement of trackside equipment.</p> <p>Non-Destructive Testing – Manual ultrasonic testing of rail and other non-destructive testing methods for turnout components.</p> <p>Maintenance Ballast – The distribution of ballast for restoration of ballast profile for turnouts. This includes ballast ploughing or regulator ballast profiling after distribution of ballast (but without tamping).</p>
Asset Renewal	<p>Renewals for turnouts are either full turnout replacement or turnout component repair. Full turnout renewal involves the replacement of a complete turnout, including bearers, ballast, formation, steel components and all signalling and electrical equipment.</p> <p>Turnout component renewal involves the renewal of the major components such as switches, stock rails, lead rails, crossings (vees) and bearers due to fatigue and/or wear and/or rollingstock damage (e.g. derailment).</p> <p>Turnouts are complex assets that require a coordinated design between civil, signalling and electrical designers. The rail, bearer (sleepers) components, subgrade and tie-in to the existing track are civil assets. The turnout motors, detection and tie-in to the safeworking interlocking systems and signalling infrastructure are control systems assets. Any changes to the turnout geometry will have an effect on the overhead wires which are electrical assets.</p> <p>Due to the site-specific variability, turnout design and turnout renewals are managed as multiple project deliverables with design completed in one (or more) MRSB period and renewal in a future MRSB period.</p> <p>The tonnage lives of the turnouts are dependent on the type. Rail wear is usually the determining factor in swing nose crossings, while mechanical damage to the vee and components affects life in rail bound manganese turnouts. Fabricated turnouts are used only in existing track in low tonnage lines (20 TAL) and yard track. On average, the life of a swing nose crossing turnout is 1000MGT, while rail bound manganese turnouts</p>

Item	Description
	<p>have an average life of 320MGT and fabricated turnouts have an average life of 100MGT.</p> <p>The average life of turnouts in the CQCN is approximately 25 years excluding replacement of major components which have an average life of 10 years for Switch Assemblies and 20 years for Crossing Assemblies. At sites subject to high traffic demands, average lives for switch and crossing assemblies can be as low as 12-18 months.</p>
Typical Requirements	<p>Scope Turnout renewal is baseload scope as some renewals are typically required each year. The specific scope is dependent on the configuration of the turnout, traffic task and performance of the turnout.</p> <p>Strategic renewals are required in locations such as Callemondah Yard where there are several turnouts requiring renewal and requires integration with interlocking upgrades.</p> <p>Combinations of turnouts in yards and crossovers are designed as a group to improve the efficiency and outcome of the design process. Where possible these turnout groups are constructed at the same time to reduce construction costs and reset the track asset back to an integrated and well performing state.</p>
Supply Chain Risks being Managed	<p>The effective management of turnouts involves regular inspections, maintenance and the use of modern technology to ensure their reliable function to divert rollingstock from one track to another. Failures or misaligned turnouts may cause derailments, especially at higher speeds, extensively damaging rollingstock and rail infrastructure, resulting in severe supply chain disruptions. Preventive maintenance and timely repair and replacement of turnout components will reduce the likelihood of incidents, ensuring safe and on time performance of the supply chain.</p>

Ballast

Ballast is the material placed under, between and around the sleepers and its function is to:

- provide a firm and even bearing for the sleepers and to distribute the loads imposed by traffic as evenly as possible to the formation
- permit drainage of the track
- resist lateral movement of the track
- resist longitudinal movement of the track; and
- provide a medium for packing the track to vertical and horizontal alignment.

During its life, the condition of ballast degrades, primarily by:

- ballast particle attrition; and
- filling of ballast voids with fouling material, such as coal fines and subgrade material. Where track has ballast of poorer condition, this will result in the development of mudholes and a loss of track geometry manifesting in an irregular running surface and interface with rollingstock.

When the effects of fouled ballast become evident, it typically results in poor track geometry which leads to speed restrictions. This in turn leads to increased maintenance, including tamping to restore top and line and more extensive track closures to undertake remedial work. Both speed restrictions and extra maintenance requirements reduce the capacity of the system, increasing train operating and track maintenance costs. The condition of the ballast for the CQCN is determined through testing via Ground Penetrating Radar (GPR). GPR is a globally-recognised and non-invasive method of objectively

quantifying the ballast condition. As GPR testing is a cyclic activity and a management tool to monitor the condition of ballast, it is considered an operational activity and will be undertaken at a frequency as determined for each type of location.

Ballast cleaning and renewal is delivered by the Ballast Cleaning Machine or via excavator undercutting, for mainline and turnout undercutting or via removal and replacement of ballast as part of Bridge Ballast renewal.

The Ballast Cleaning Machine (BCM) or RM902 is a high production mainline ballast undercutting machine. The RM902 is most efficient at delivering crib and shoulder undercuts simultaneously over longer sections and entered production in May 2021.

Excavator Undercutting is undertaken using wet hire contractors and is appropriate for smaller sections and/or areas that are not suitable for the RM902 either due to location or ballast condition.

The management of fouled ballast on Network’s concrete bridges involves the removal of rail and sleepers prior to ballast replacement, it is therefore more intrusive, a slower activity and also requires rigorous, engineered safety protocols to manage the risks of working at height. Fouled ballast is removed (and similarly, clean ballast reinstated) using front end loaders. These work methods increase the unit rate of bridge ballast renewals. The need to remove the track is due to the inability to:

- spoil ballast to the side with excavator cutter bars due to bridge kerbing; and
- the actual width of the RM902 cutter bar is too wide and does not fit within the bridge kerbing.

Due to the intrusive nature of the work, a review of sleeper and rail condition is undertaken early in the condition assessment to potentially integrate the renewal of these components when required. Assessments will also be undertaken on the condition of the formation and relieving slabs on the approach, ability for the kerbing to contain ballast and demand for walkways with operational needs. Depending on the outcome of the assessments, scope can vary considerably between each bridge site.

Railway monuments are located within the rail corridor as a fixed points or on electrical masts to indicate the correct level or position of the track. Measurements are taken from these to confirm the correct position of the track to ensure that the ballast cleaning activity and associated resurfacing correctly locates the track to design alignment.

Effective maintenance and renewal of the ballast provides the following benefits to the supply chain:

- **Asset Reliability** – Reduce network delays due to asset failure associated with track geometry defects and mudholes linked to poor ballast condition due to ballast fouling.
- **Throughput** – Maintaining and renewing in a planned manner within identified closure pattern avoids unplanned outages and associated throughput losses. Proactive ballast condition management mitigates TSR’s caused by poor ballast condition and related geometry.
- **Safety**- Improve the wet weather resilience of track (reduced unplanned defects which need to be responded to in a reactive manner). Reduces train derailment risk by managing asset condition.

Table 72 Ballast

Item	Description
Typical Description	Ballast is sourced from a number of quarries across the CQCN. Location is a critical consideration to reduce transit distance and delivery costs.

Item	Description
	<p>Ballast is required to meet Aurizon Network’s specifications and standards. This engineering standard details:</p> <ul style="list-style-type: none"> • Size and Grading: Railway ballast typically consists of crushed stone with a range of particle sizes, from small fragments to larger pieces. The grading, or distribution of particle sizes, is deliberately specified to provide stability and drainage. • Angularity: The ballast material should have angular or rough-edged particles. This angularity helps interlock the particles, providing stability and preventing excessive lateral and longitudinal movement of the track. • Durability: Ballast must be durable and resistant to wear and degradation, as it is subjected to heavy loads and continuous stress from passing trains under varying climatic conditions.
Maintenance	<p>Mainline Track Resurfacing – Mechanised resurfacing by a tamper restores the geometry of the track by lifting (vertical) and lining (lateral) the track to the appropriate level and alignment and consolidating and stabilising the ballast underneath the sleepers. It is followed by ballast profiling by a Ballast Regulator.</p> <p>Turnout Track Resurfacing – Mechanised resurfacing carried out on turnouts involving mechanical lifting, lining and tamping of the turnout with a Tamper Liner, followed by ballast profiling by a Ballast Regulator and includes the associated activities such as removing turnout equipment or manually topping up with ballast to ensure all areas of the turnout are adequately packed with ballast.</p> <p>Track Inspection – Ballast is visually inspected and defects (e.g. mudholes) are reported, with speed restrictions imposed to manage track geometry degradation and hold ballast condition until maintenance or renewals are able to be undertaken.</p> <p>Track Geometry Recording – Involves measuring the track geometry (top and line) via mechanical systems such as ATIS, or manual means such as measurements taken by track inspectors. Track geometry measurements are required to understand the health of the track and ballast asset and are often shown as Track Condition Index.</p> <p>Maintenance Ballast – The purchase and distribution of ballast for restoration of ballast profile on mainline track and turnouts.</p> <p>Ballast Undercutting – Minor – This planned corrective maintenance activity involves the excavation of the fouled ballast and mud holes from beneath and adjacent to the sleepers. Fresh ballast is added and tamped to restore the track to the correct height and ballast depth for a length of track up to 40 sleeper bays (as a guide). This is for full width or shoulder ballast.</p> <p>Ballast Undercutting – Turnout Minor – This planned corrective maintenance activity involves the excavation of the fouled ballast and mud holes from beneath and adjacent to a turnout by minor mechanised equipment such as an excavator (with attachments) or by other means for less than 10 sleeper bays (as a guide). Fresh ballast is added and tamped to restore the turnout to the correct height and ballast depth.</p> <p>Top and Line Spot Resurfacing – Localised management of geometry defects within track using manual or mechanically assisted processes, such as excavators with tamper attachments or manual hand tamping equipment and sleeper jacks.</p> <p>Turnout Maintenance – Turnout spot resurfacing is included in this maintenance activity and is used to improve ballast and geometry profile through a turnout.</p> <p>Level Crossing Maintenance – Includes the resurfacing at the crossing interface to maintain ballast condition and improve the top and line through the level crossing. This includes removal of the road surface pre-resurfacing activities and thereafter reinstatement of the road surface as well as any requisite traffic management activities.</p>
Asset Renewal	<p>GPR is a globally recognised and non-invasive method of objectively quantifying the ballast condition. It is leveraged to understand current ballast condition and by comparison to prior GPR runs, enables an understanding of fouling rates. GPR is one of a few key metrics utilised to direct ballast renewal efforts.</p> <p>Condition, and ultimately scope is determined based on the number and frequency of ballast related maintenance activities (a lag indicator of deteriorating track geometry), track geometry history, and GPR which is then reviewed and validated by Operational</p>

Item	Description
	<p>teams. The most fouled locations or those showing the greatest degradation are matched where possible to the production of the undercutting fleet and track access constraints.</p> <p>Aurizon Network utilises a ballast condition analyser model to assist in identifying future years renewal requirements based on ballast fouling and geometry condition.</p> <p>Once locations of significant fouling have been identified, pre-digs are performed prior to execution. Pre-digs confirm the makeup of the material that is fouling the ballast (e.g., clay, coal) and the moisture content of the fouled ballast; this field testing informs site specific expected return rates and ballast volume requirements which are used in the planning process.</p> <p>The primary method to renew ballast is via ballast undercutting. This involves removing fouled material from ballast in track and turnouts, replacing with screened or new ballast and restoring track alignment and geometry. The intent of this activity is to re-establish a drainage path away from the sleepers and track infrastructure.</p> <p>Ballast Renewal products are:</p> <ul style="list-style-type: none"> • Mainline Ballast Cleaning (also referred to as Ballast Undercutting Mainline) – Utilises the BCM or excavator undercutting units. The ballast is removed from under the track structure via an undercutting bar for ballast beneath the sleepers and a shoulder cutter for ballast adjacent to the sleepers. The ballast is either screened and replaced by the BCM or removed from track in its entirety and replaced with new clean ballast via ballast trains. Utilisation of the excavator undercutter will see all fouled ballast removed and replaced with new ballast. The depth of the undercut and replacement ballast amount is site dependant, driven by the amount of fouling present and the moisture content of the ballast being undercut. • Turnout Ballast Cleaning (also referred to as Turnout Undercutting) – Using excavator undercutting units, the ballast under the turnout is removed and replaced with clean ballast. The BCM cannot cut through turnouts given the additional width and complexity of turnouts. • Bridge Ballast Replacement (also referred to as Bridge Rollout) – Given the access constraints on bridge structures, undercutting by the BCM or Excavator Undercutting units is not possible. Bridge ballast replacements see the entire track structure removed (rail and sleepers), the fouled ballast removed via loader, bridge deck cleaned and inspected, new ballast placed and the track structure re-instated. This results in a full ballast replacement for the selected bridge. • Monumenting – Detailed survey, design and installation of new track data plaques. This enables future track maintenance activities to align to the design alignments. <p>Ballast renewal can also be completed as part of Track Upgrade scope where more than one element of the permanent way assets is renewed together, for example rail and sleepers.</p>
<p>Typical Scope Requirements</p>	<p>Aurizon Network has historically cleaned 125km and 40 turnouts per year based on actual activities aligned to an averaged intervention threshold of 38% Percentage Void Contamination (PVC). Aurizon Network determines the ballast renewal scope via the Ballast Condition Analyser.</p> <p>The achievement of this scope is heavily dependent on weather conditions, access available, and the extent of fouling encountered at each work location. As a result of developments over recent years, Aurizon Network identifies and prioritises scope based on both asset condition, criticality and factors affecting execution. These developments include:</p> <p>the introduction of the Ballast Condition Analyser, which looks at current and historic GPR data and planned and historical maintenance activities (resurfacing, mudhole repair etc) to determine the future year scope locations; the improved understanding of site-specific conditions including depth of ballast (volumetric conditions), the existence of clay and other material through pre-digs (screenability and return rate); and the efficiency of the RM902 over longer sections of track.</p>

Item	Description
	Aurizon Network continues to progress further targeted improvements to address the root cause of coal fouling and improve the effective and transparent use of data in the scoping processes.
Supply Chain Risks being Managed	Effective management of ballast mitigates the risks such as track instability, derailments, water damage, excessive wear which result in delays and cancellations causing service disruptions in the supply chain. Regular inspections, cleaning, renewal and proper drainage management help to ensure the long-term stability of the ballast layer, ultimately reducing the risk of incidents and supporting the smooth operation of rollingstock.

Structures

Structures assets include the renewal and maintenance of:

- **Bridges** – over waterways and Aurizon owned road over rail, rail over road bridge and pedestrian bridges
- **Culverts** – of varying sizes and construction; and
- **Other ancillary structures** – retaining walls, load slabs, inspection structures.

Effective maintenance and renewal of Structures provide the following benefits to the coal supply chain:

- **Asset Reliability**— Reduce network delays associated with unplanned asset activity. Structures have a low likelihood of failure in a new state and require minimal maintenance once renewed.
- **Capacity**— Renewing in a planned manner within identified closure pattern avoiding unplanned outages and associated throughput losses. Renewing prior to culvert or pipe misalignment resulting in renewals completed under loaded traffic rather than requiring a dedicated track possession.
- **Safety**— Reduce derailment risk with trains by managing asset condition to be fit for purpose.

Table 73 Structures

Item	Description
Typical Description	<p>The choice and arrangement of culverts or bridge structures is dependent on the purpose of the structure and the hydrology required at the site.</p> <p>Structures can provide access for either permanent waterways, creeks and overflows or for flood mitigation and storm runoff.</p> <p>Culverts in the CQCN are either:</p> <ul style="list-style-type: none"> • Reinforced concrete box culverts of varying sizes • Reinforced concrete pipe culverts of varying sizes • Concrete or masonry arch culverts • Cast in situ pipe culverts • Corrugated metal pipes. <p>Bridges in the CQCN are:</p> <ul style="list-style-type: none"> • Concrete substructure (piers) and bridge (decks) • Steel substructure and bridge • Concrete substructure and steel bridge.

Item	Description
Maintenance	<p>Structures Inspection – All inspections of structures, collecting and recording of the condition of structures and prioritising defects for repair. This includes Civil Engineering Structures Standards inspections such as patrol, general and detail inspections – scheduled and unscheduled.</p> <p>Bridge Repairs – Corrective maintenance on concrete, steel or steel and concrete composite or timber bridges which result in the repair or replacement of minor components or defects.</p> <p>Drainage Maintenance – Corrective maintenance of drainage culverts and pipe defects including concrete repair works, painting protection, lining protection systems, scour repairs, embankment protection repairs or temporary supports.</p> <p>Ancillary Structures Maintenance – Corrective maintenance of ancillary structures such as retaining walls, slabs and loadouts, electrification barriers and inspection pits.</p> <p>Culvert Cleaning – Corrective and preventive cleaning of culverts including inlets, outlets and, through the culverts.</p>
Asset Renewal	<p>The renewal decision for structures is primarily based on condition. Other factors considered are location, size and long-term demand on the track section.</p> <ul style="list-style-type: none"> • Remove and Replace Culvert – Removal of track structure and ballast and full replacement of the culvert with a same size replacement, larger capacity to increase water flow capacity, or a smaller size that will still provide the required flood immunity. • Remove and Replace Bridge and Bridge Components – From replacement of small components such as bridge bearing pads, more significant components such as girders or strengthening of girders to upgrade the loading capacity, or removal and replacement of an entire bridge super- and sub-structure. • Lining Pipes – Corrugated Metal Pipes (CMPs) were historically installed on many parts of the network and have a considerably lower design life. The thin-walled section CMPs are very susceptible to severe corrosion. Several lining options have been considered for these assets to prevent the removal of the track above. Currently cured in place pipe (CIPP) and reinforced concrete lining are the main options for renewal of these assets without removing the existing asset. Aurizon Network continues to investigate alternative structural options for these lining techniques. CIPP lining and concrete lining is also being applied to deteriorated existing reinforced concrete pipes on the network. • Concrete Lined Box Culverts – There are many box culverts on the CQCN network where concrete lining is a structural solution for a deteriorated box culvert, subject to suitable height and width. Hydrology studies demonstrate a reduction of the waterway will still meet flood immunity and afflux requirements. The reinforced concrete lining provides for the full structural capacity of the track loading and has the benefit of generally not requiring any track closure. • Delete Structure – During hydrology assessments for assets to be renewed, if it is determined that the asset is not required to meet flood immunity and it is reasonable to divert any water to neighbouring structure then the asset will be considered for deletion. The deletion of an asset will also involve grout filling of the culvert and the earthworks on the inlet and outlet sides to provide reasonable drainage to any nearby structures.
Typical Requirements	<p>Scope</p> <p>Across the CQCN there are 354 bridges and 3,911 culverts. These structures can be categorised by their age and design load ratings. The installation dates of these structures range across the network, with some assets greater than 100 years old. The average age of Blackwater structures is 46 years, Goonyella is 45 years, Moura is 49 years, Newlands is 32 years and GAPE is 12 years.</p> <p>These assets are predominantly concrete structures and have design lives of up to 50-100 years. Several of these structures are operating above their design load capacity. Each Coal System currently operates at 26.5tal, whilst a significant number of culverts and bridges within the CQCN have load ratings from 15tal to 22tal.</p>

Item	Description
	<p>This overloading of structures is managed with regular inspections, and specific maintenance practices such as propping of culverts and speed restrictions, however the overloading increases the rate at which defects propagate and ultimately reduces the design life of the structure. As with all structural assets, the condition of the asset is the primary driver for renewal.</p> <p>Aurizon Network's condition monitoring regime informs the development of both the maintenance and renewal planning of the structural assets operating at and beyond their original design function.</p> <p>Structures renewals are considered as Baseload scope renewals. Three out of the four systems have an average age within 5 years of their original 50-year design life and therefore renewals are expected to continue at similar or increased rate in future financial years.</p>
Supply Chain Risks being Managed	<p>The effective management of structures plays a key role in supporting rail infrastructure and its proper management helps minimise risks from structural failures. Structural failures may result in delays due to temporary speed restrictions, or operational disruption to manage the failure which can severely impact the supply chain. Regular Inspections, preventive and predictive maintenance and renewals and upgrades will ensure that the structures remain reliable and safe, supporting the flow of rollingstock and minimising risks to the supply chain.</p>

Civil Assets

Civil assets are those assets that support the Permanent Way assets and include:

- Formation
- Level Crossings
- Longitudinal Drainage
- Access Roads and Access Points
- Corridor Fencing
- Slope Stability (Earthworks - Cuttings and Embankments).

Effective maintenance and renewal of the civil assets provide the following benefits to the coal supply chain:

- **Asset Reliability** – Reduce network delays associated with asset failure by strategically renewing assets to the current engineering standards.
- **Capacity** – Renewing in a planned manner within identified closure pattern avoiding unplanned outages and associated throughput losses.
- **Safety** – Reduce derailment risk of trains by managing asset condition.

Table 74 Civil Assets

Item	Description
Typical Description	<p>Formation is the track substructure in which ballast and the track superstructure is laid upon. The formation depth and material in which its constructed across CQCN varies, depending on when that particular asset was constructed or last renewed. There are large portions of CQCN that have pavement that is more than 50 years old and is the</p>

Item	Description
	<p>original pavement that was constructed for lesser axle loads than currently seen in CQCN. When renewing formation, Aurizon Network has a standard formation depth of 600mm, extending deeper where required to bridge unsuitable subgrade material.</p> <p>The formation is made up of capping material, which is a blended unbound granular material intended to help seal the surface under the ballast, reduce water ingress, and prolong the life of the formation. Geotextiles and geogrids are incorporated to the formation structure to improve the tensile strength of the formation.</p> <p>A level crossing or an 'at grade' crossing is an intersection where a railway line crosses a road or a pedestrian path at the same level. The CQCN rail network has several types of level crossings including Public, Private/Occupation, Pedestrian, Hi-Rail Access Points and Maintenance. These level crossings have either passive or active control and can have a sealed or unsealed surface depending on use and risk.</p> <p>Longitudinal Drains consist of cess and catch drains along the corridor that drain water from the track or getting to the track and integrate with the cross drains such as Culverts and Bridges to flow the water away from the corridor. Poor drainage accelerates the deterioration of formation and ballast defects, increasing the severity of defects, shortening the response time and resulting in increased impacts to operations.</p> <p>Access roads traverse along the rail corridor and link access points (entrances and exits) to the public road network. Like formation, access road construction across CQCN varies depending on when the asset was constructed or last renewed, with gravel unsealed surface being the most common.</p> <p>Fencing is installed along the rail corridor to provide security. Fencing ranges from high security fences to no fences depending on risk. A risk-based approach and consultation with adjoining landholders is completed to determine the type and standard of fencing required. The majority of the fencing in the CQCN is barbed wire stock fencing.</p> <p>As the railway traverses the natural ground topography the ruling grade (steepness of track) is managed via cuttings and embankments that allows the railway to pass at an acceptable level and gradient. In some areas, the batters (walls) of these embankments and cutting require specialised strengthening to improve slope stability.</p>
Maintenance	<p>Inspections – Scheduled and unscheduled inspections are annually undertaken to assess and record the condition of the asset and identify defects for testing, monitoring or rectification.</p> <p>Earthworks – Non-formation earthworks and drainage clearing and cleaning to open waterways, spot repairs of access roads, access points, stow locations, walkways and maintaining cuttings and embankments.</p> <p>Fencing – Repairs of existing fencing including associated signage, gate repairs, spot fence repairs and wire tensioning.</p> <p>Fire and Vegetation Management – Control by chemical, mechanical and burning off operations to manage interference with the running of trains, electrical overhead and sighting distances along the corridor. This maintenance activity is moving to be a preventive maintenance task away from corrective to allow for effective contractor engagement with define scope and cost. Also allows for planned location selection.</p> <p>Level Crossing Maintenance – Road surface repair, signage, repair and cleaning of the flangeways, resurfacing of the track at the road rail interface, cleaning/regrading of cess drains, vegetation controls for sighting distance.</p> <p>Corridor Drainage - Improving the drainage along the corridor to improve the performance and reliability of the CQCN. This involves relocating spoil from drains, reshaping, reprofiling and widening of the longitudinal drainage.</p>
Asset Renewal	<p>Formation Renewal Planned – Construction/renewal or strengthening of the formation over longer track sections that have presented reliability issues and attracted increased amount of corrective maintenance as either formation repairs or track geometry faults. Preventive formation renewal activity targets locations with poor formation material performance to prevent future failures.</p> <p>Formation Renewal Reactive – An allocation made for each system to rectify smaller sections of formation that have an accelerated condition degradation or are not</p>

Item	Description
	<p>receptive to holding works such as track resurfacing (e.g., lift and pack and tamping) to address track geometry issues.</p> <p>Level Crossing Renewals Planned – The scope of these works varies at a site level and are driven by a risk-based approach for renewal. Level crossing renewals may include upgrading of the safety systems from passive control (stop signs and give way signs) to active control (flashing lights, boom gates etc). The scope can also include road surface upgrades or widening, formation reconstruction, upgrades to the track structure through the level crossing, installation of rubber flangeways to the rail, upgrades to warning signage and lighting.</p> <p>Level Crossing Renewal Reactive – Allocation per system for minor safety enhancements such as signage, road surface management, resurfacing, ballast undercutting, repair of rail, rectification of wide gauge etc.</p> <p>Corridor Fencing Renewal - Renewal of fencing to replace life expired fencing and gates, upgrading the standard of the existing fences and/or gates or the establishment of new fences and/or gates in the corridor. Usually identified through detailed inspections and analysis of maintenance & incident history (i.e. trespass or livestock in corridor).</p> <p>Access Road Renewal – Renewal or upgrade the standard of the existing access roads. Usually targeted short /isolated locations to improve access reliability, impassible locations (i.e. causeways at culverts) or the establishment of access roads in the corridor to address legacy access/boundary issues.</p> <p>Access Points Renewal – An allocation is made for each coal systems for planned access point sites. These access points are heavily used access points for crew change, routine maintenance access, and for access during renewal/recovery works. These access points are not fully compliant with DTMR standards with respect to safe access and exist thus requiring constructing turning (or slip) lanes, drainage structures and signage installation. During the design phase, these access points are surveyed and if identified with inadequate sighting distance, proposal for relocation is sought.</p> <p>Slope Stability Renewal – Construction/renewal works associated with addressing or prevention of slope instability – including landslips within embankments, landslips within soil cuttings and rockfall / landslips within rock cuttings. Works including but not limited to mitigating the risk of rockfall and landslips through slope stabilisation, geomesh and soil nails, introducing wayside system monitoring at hazard locations, ground monitoring sensor installation to provide early warnings of landslip or providing increased resilience in severe weather events.</p>
<p>Typical Requirements</p> <p>Scope</p>	<p>Civil Assets are a combination of Baseload Renewals and allocations for Reactive Renewals.</p> <p>Formation deterioration is impacted by multiple factors and especially by unfavourable wet weather conditions which effect the formation integrity and associated reliability. This requires significant corrective maintenance of small sections of track due to geometry degradation likely resulting in multiple Temporary Speed Restrictions (TSRs).</p> <p>A strategic approach is to create an optimum balance between corrective/reactive works and preventive works. Planned renewals for formation across key problem locations across CQCN increases the reliability and performance of the asset whilst reducing the corrective action requirements to maintain the asset. Future Corridor Security (fencing) programs will also move toward a higher proportion of planned scope identification.</p>
<p>Supply Chain Risks being Managed</p>	<p>The effective management of formation, earthworks (cuttings and embankments, level crossings, vegetation, fencing and other corridor assets which form the foundation of the Rail Infrastructure is critical to their overall safety, reliability and performance of the rail operations. The failure of these assets directly influences the stability of the track and overhead and the reliability of the supply chain. Well managed Civil Assets, provides a stable foundation for the track, preventing track deformation, settlement and failure, ensuring that the trains operate at full speed without safety concerns, minimising delays and cancellations and ensure the corridor is accessible and secure.</p>

Control Systems

Control systems assets are the physical and digital assets that provide, train control, telecommunications, and wayside monitoring systems. These assets provide the capacity multiplier for the track assets, that is they allow for the safe movement of more train services over the track structure.

Control Systems include the renewal and maintenance of:

- Train Control Systems
- Telecommunications
- Wayside Systems.

Effective maintenance and renewal of the control systems assets provide the following benefits to the coal supply chain:

- **Asset Reliability**— Given these assets do not wear but rather age to a point where they are no longer supported, renewal ahead of failure is required to retain the assets' reliability.
- **Capacity** - Renewal and system improvements to best move trains through the system in an efficient and safe way.
- **Safety** - Ensuring the critical signalling and train control systems are robust and effective in the separation of trains. Providing clear communications functionality across the CQCN systems.

Table 75 Control Systems

Item	Description
Typical Description	<ul style="list-style-type: none"> • Train Control Systems: Signalling system, level crossing active protection, interlockings and point motors. • Telecommunications: the data network required to connect assets to train control, includes the optic fibre network, digital radio, and microwave radio systems. • Wayside Systems: assets in the rail corridor that provide a level of monitoring and alarming to protect track and overhead assets.
Maintenance	<p>An assessment has been performed on all asset types to determine the consequence of asset failure, and the viability of preventing failure. If asset failure would have significant safety, environmental, or operational impact, and the occurrence of failure can be mitigated by preventive intervention, then the assets will undergo further analysis to determine specific maintenance activities and intervals. Assets identified as having minimal consequence because of failure and/or no viable measures to minimise failure, are classified as fix on fail.</p> <p>Control Systems maintenance can broadly be grouped in 3 areas.</p> <ul style="list-style-type: none"> • Telecommunications maintenance <ul style="list-style-type: none"> ○ Telecom Network Maintenance – Maintenance of the major bearer systems and infrastructure providing bandwidth for train control, voice and communication services including Train Control Radio and Maintenance Services Radio. ○ Cable Route Maintenance - Maintenance and repair of all cableways, markers, troughing and cables including fibre testing and repairs. • Signalling maintenance <ul style="list-style-type: none"> ○ Signalling Field Maintenance – Maintenance of all field equipment associated with signalling control. This activity primarily involves inspections of equipment and correcting identified out of tolerance items.

Item	Description
	<ul style="list-style-type: none"> ○ Signalling Control Systems – Maintenance of control centre-based equipment relating to the signalling control of trains including the central computer systems: Universal Train Control (UTC) and Direct Traffic Control (DTC) ○ Level Crossing Protection – Maintenance of equipment such as pedestrian gates, boom gates, flashing lights and associated circuitry. It involves the inspection of equipment and where necessary spot replacement of early failure or damaged components. ○ Westect Automatic Train Protection (Westect ATP) Maintenance – Maintenance of Westect ATP Transponders, Westect ATP Radio and other specialised equipment through performance servicing and where necessary spot replacement of early failure or damaged components. ● Asset Protection and other maintenance <ul style="list-style-type: none"> ○ Wayside Maintenance – Maintenance of Dragging Equipment Detectors, Hot Bearing Detectors / Hot Wheel Detectors, Train Acoustic Detection, Coal Dust Monitoring Sites and other specialised equipment through performance servicing and where necessary spot replacement of early failure or damaged components. ○ Weighbridge Maintenance - Inspections of weighbridge equipment, performance servicing and where necessary spot replacement of early failure or damaged components. ○ Power Systems Control - Maintenance of field and master station control centre-based equipment including the Power Supervisory Control System (SCADA) such as Remote Terminal Units (RTU). ○ Remote Monitor System (RMS) – Maintenance of field and master station control centre-based equipment, which includes Field RTUs. Monitors Black Mountain Headways, Level Crossings and corridor weather stations.
Asset Renewal	<p>Control Systems assets are predominantly technology assets and electrical in nature. These assets are characterised by having a higher level of failure on install as latent defects are identified followed by a stable period where the rate of failure is relatively low and constant. As components wear out and reach the end of their service life, the rate of failure rapidly increases. Additionally, obsolescence of vendor supply support and componentry parts (e.g., operating systems no longer being supported, a reduction in spare part availability or advances in alternate technologies.) can trigger the end of life and the need to modernise the asset.</p> <p>The inherent nature of these assets is such that the exact point of failure is unknown. To promote reliability of operations, a level of redundancy can be typically built into these systems. Renewals are targeted where the rate of failure increases to a point where unacceptable throughput losses may occur.</p> <p>The design lives of Control System assets are typically:</p> <ul style="list-style-type: none"> ● Asset Protection – 10 to 15 years ● Posts, Gantries, Relay interlockings – 35 years ● Track circuits, Axle counters, Processor Based Interlockings – 25 years ● Points machines, Telemetry units – 20 years ● LED signal modules – 15 years. <p>Telecommunications Renewals</p> <p>The Telecommunications Operational Network consists of layers of infrastructure with the base component being optical fibre cable and the digital microwave radio system. Upon this sits the Synchronous Digital Hierarchy and Operational Data Communications Network over which operational systems such as TETRA, Power Supervisory System and signalling telemetry operate.</p> <p>A condition-based approach is generally applied to all the discrete equipment and is reflective of the age of the asset. Other factors that can affect condition of the asset include supportability, spares availability, and cyber-security vulnerabilities.</p>

Item	Description
	<p>Renewal programs will also consider changes in systems that use the telecommunications network. For example, a move from analogue telemetry to networked connectivity introduces different requirements for the telecommunications network.</p> <p>Signalling Renewals</p> <p>The Signalling Operational Network consists of layers of infrastructure and systems with the base components being signal heads and mounting structures, housing, interlockings, points, level crossings and UTC and DTC systems.</p> <p>A condition-based approach is generally applied to all the discrete equipment and is reflective of the age of the asset and the safety impact of failure and level of built-in redundancy. Other factors that can affect condition of the asset include supportability, spares availability, and cyber-security vulnerabilities.</p> <p>Asset Protection Renewals</p> <p>Asset Protection consists of a wide array of infrastructure and systems that measure, monitor, and protect Network and Rollingstock assets as well as support safe-working systems. Some key components being environmental monitors, weighing systems, rollingstock monitors, train detection, flood switches and train protection systems. A condition-based approach is generally applied to all the discrete equipment and is reflective of the age of the asset. Other factors that can affect condition of the asset include supportability, spares availability, and cyber-security vulnerabilities.</p>
<p>Typical Requirements</p> <p>Scope</p>	<p>Control Systems assets renewals are typically a combination of Baseload Renewals and allocations for Reactive Renewals.</p> <p>Some Control System assets renewals, such as interlockings and optic cables are considered Strategic renewals as these renewal plans require significant optioneering and result in multi-year investment plans.</p> <p>The trigger for the renewal of Control Systems assets is predominantly driven by the age of the asset along its life cycle. These assets do not necessarily wear with tonnage, and often don't show degradation until the point of failure. Obsolescence of data systems or components is also a key trigger for asset renewal.</p>
<p>Supply Chain Risks being Managed</p>	<p>The effective management of Control Systems' assets involves inspection, servicing, monitoring, and renewal and/or upgrades to better technology when assets degrade, or equipment/components become obsolete. It also includes providing a robust system with back-ups that are managed to prevent unexpected failures that could lead to incidents which result in cancellations and delays. Effective management of Control System assets enhances the safety and efficiency of the railway operations and therefore providing a reliable supply chain.</p>

Electrical Assets

The Electrical Safety Act in Queensland requires that as a Prescribed Entity, Aurizon Network must ensure that the asset is operated in a way that is electrically safe. This includes managing the high voltage electrical assets through effective maintenance and renewals activities.

- Electrical Assets include the renewal and maintenance of:
- Overhead Line Equipment
- Power Systems
- Traction Substations.

Effective maintenance and renewal of the Electrical assets provide the following benefits to the coal supply chain:

- **Asset Reliability** - These are typically long-run assets which will eventually fail due to age-related defects and/or environmental factors. Renewal decisions are typically made based on failure risk or safety.
- **Capacity** -Traction power systems have built-in redundancy and typically allow normal throughput to continue in the event of an outage of one major piece of plant. By contrast, a single dewirement on the overhead line system will impact both electric and diesel services. Because of this vulnerability, renewals and maintenance of the overhead line system follows a “Detect and Protect” strategy: Detect and rectify emerging failure conditions and Protect the asset from external factors (typically fauna and flora ingress) which cause electrical trips that have the potential to damage the asset.
- **Safety** - Many of the High Voltage traction assets have inherent safety functions (e.g., protection and earthing systems). As a Prescribed Electricity Entity, Aurizon Network has clearly defined obligations to maintain an electrically safe system. This includes a mandatory annual Safety Management System audit by a qualified external auditor who has been accredited by the Electrical Safety Regulator.

Table 76 Electrical Assets

Item	Description
Typical Description	<p>The Overhead Line Equipment comprises conductors (wires), insulators and mast structures, headspans and termination portals.</p> <p>Power System comprises substations (including transformers, switchgear, and secondary systems), trackside autotransformers, and motorised isolators.</p>
Maintenance	<p>Inspection and maintenance are regularly performed on the electrical substation and overhead line assets to manage the risk of failure.</p> <ul style="list-style-type: none"> • Preventive Overhead Maintenance - inspections of overhead equipment, performance servicing and where necessary spot replacement of early failure or damaged components. This includes inspections of critical equipment such as section insulators, neutral sections, isolators, balance weights (position and condition) and other specialised equipment, and inspection for vegetation clearing around overhead. • Corrective Overhead Maintenance - is undertaken for all field equipment associated with overhead infrastructure to correct an identified fault and restore network availability. • Preventive Traction Power System Maintenance - involves the maintenance inspection, operation, and performance servicing of all substation equipment. This includes transformers, switchgear, secondary systems, buildings and substation compounds and ancillary equipment such as fault locators. • Corrective Traction Power System Maintenance - is undertaken for all power systems equipment to correct any identified faults and restore network availability. Maintenance for this product covers the inspection, operation, and performance servicing of all the power system equipment and substation equipment. This includes transformers, switchgear, secondary systems, buildings and substation compounds and ancillary equipment such as fault locators.
Asset Renewal	<p>Primary Electrical system equipment are typically long-run assets with renewal intervals guided by the nominal asset service life and asset condition. The service life of Overhead Line can be reduced by environmental factors such as proximity to the coast. Examples of typical nominal service life for primary systems is:</p> <ul style="list-style-type: none"> • Contact wire: 70 - 80 years • Section insulators & Neutral Sections: 10 - 20 years • Power Transformers and Autotransformers: 25 – 40 years • Switchgear – 40 years

Item	Description
	<p>Secondary system assets typically have a shorter nominal service life than primary assets. Their renewal intervals are governed by this service life and other factors such as obsolescence of hardware. The replacement of legacy electro-mechanical protection relays with modern digital protection relays is an example of this. Examples of typical nominal service life for secondary systems is:</p> <ul style="list-style-type: none"> • Protection relays: 15 years • DC supply systems: 15 years • Fault locators: 10 years.
<p>Typical Requirements</p> <p>Scope</p>	<p>Electrical assets renewals are typically a combination of Baseload Renewals and allocations for Reactive Renewals.</p> <p>Some Electrical assets renewals, such as traction substations and auto-transformers, are considered Strategic renewals as these renewal plans require significant optioneering and result in multi-year investment plans.</p> <p>Some Traction Power Systems asset renewal is primarily driven by the age of the assets against their lifecycle. The renewal of other Traction assets including the Overhead Line is driven by a combination of age, environmental factors, and tonnage.</p>
<p>Supply Chain Risks being Managed</p>	<p>The effective management of Electrical Assets involves inspections, services and predictive maintenance and renewals to ensure failures are identified and rectified before they occur. This is due to electrical incidents, even though only a few in number, having a major impact on operations with significant delays and cancellations when an incident occurs. Electrical Assets are highly regulated and requires compliance and reporting of incidents to Electrical Safety Office (ESO). Effective management of the Electrical Assets not only minimises disruptions to rail operations but also avoids non-compliance with regulatory standards and resulting action imposed by the ESO.</p>

Assets with Interdependencies

Individual assets and have interdependencies on each other to form the railway. Aurizon Network takes an asset level view and a macro view to look at the system and the broader supply chain.

Turnouts

The turnout entails a complex geometry and multi-disciplinary engineering, which makes it one of the most critical railway infrastructures. The civil aspect of a turnout, which is the physical infrastructure, interacts closely with the other discipline components of the turnout. Within a turnout, control systems including Points Equipment move switches and crossings. The civil components e.g. ballast, sleepers, rails and formation, must be properly aligned and stable to support the mechanical components of the turnout and ensure that the turnout mechanisms operate smoothly under various loads and conditions. Corrective and preventive civil track geometry activities assist with the performance of the Points Equipment of the turnout.

Section Insulators/Track

Section Insulators are installed in the overhead contact line to electrically isolate different sections of the power supply system. When a train passes through the section insulator, its pantograph temporarily disconnects from the power line but continues to operate smoothly by drawing power from the next section. Section Insulators and the Track beneath form a system of assets, in which there needs to be reliable geometry alignment to be effective. Misalignment of the track beneath the Section Insulators leads to unfavourable passage of the pantograph. Creating a reliable Track/ Section Insulator System of Assets will minimise the likelihood of pantograph carbon strip damage incidents and resulting delays and cancellations.

Track Geometry and Overhead Line Equipment (OHLE)

The interdependencies between track geometry and overhead lines are critical for ensuring the smooth, safe and efficient operations of electrified trains in the CQCN.

The vertical height of the track influences the height of the overhead contact wire. Variations in track elevations such as gradients or undulations, must be matched by corresponding adjustment in height of the overhead to maintain consistent distance between the pantograph and the wires. If the wire is too high, the pantograph will lose contact and if the wire is too low, the pantograph will exert excessive force, causing wear and damage of the wires and pantograph. The horizontal track alignment especially on curves, affects the lateral position of the pantograph relative to the overhead wire. To ensure consistent contact, the overhead wire is staggered across the pantograph's width. The degree of stagger is designed to match the track's curvature, preventing the pantograph from deviating too far from the centre of the wire. If the overhead wire is not properly positioned on a curve, there is a risk of the pantograph losing contact or causing excessive lateral forces on the wire. Cant or superelevation of the curved track affects the relative position of the pantograph to the overhead wire. As the track lifts, the OHLE must be positioned to account for the change in angle, ensuring the wire remains positioned above the pantograph. Incorrect positioning can lead to uneven wear on both the pantograph and wire.

Track geometry irregularities such as mudholes, humps or lateral shifts such as buckles, can lead to variations in the pantograph – OHLE interaction. The track geometry relative to the OHLE equipment requires frequent measurement to ensure that the correct management activities are implemented to provide stability to the pantograph's position. As a result, the ATIS project and the Condition Monitoring team manage this interdependency between the Track Geometry and the Overhead Line Equipment.

Level Crossings

Level crossings are the intersection between the railway tracks and a road or pedestrian path at the same level, involving multiple engineering and operational disciplines to ensure safety, functionality and reliability.

The Civil Asset of a Level Crossing is the track; track geometry, drainage, the alignment of the track and the road or pedestrian path and the smooth surface, barriers, curbs and walkways of the crossing path to guide and protect users.

Control System Assets of a Level Crossing are the Active Protection which consists of flashing lights, boom gates, and barriers which activate when a train approaches and a train detection system that detects an approaching train and triggers the Active Protection. These are integrated with the overall signalling network and interlocked with the operating system to prevent a train entering the crossing until it is safe. Control System Assets also include systems used to monitor and control level crossings remotely. This includes the integration of CCTV camera, remote diagnostics and real time communications systems with the Network Control Centre.

The Electrical Asset is the overhead line equipment across the crossing for the passage of electric trains on the track infrastructure. The height of this wire and type of traffic allowed to transverse this crossing maybe controlled by the height of the overhead. Warning height signs are located prior to a level crossing to ensure that a road user's vehicle is the correct height to go under the OHLE.

The successful operation of a level crossing requires the close coordination between these disciplines.

Culverts and Track

Culverts are critical structures serving to manage water flow beneath the tracks by allowing streams, drainage channels or runoff to pass through without effecting the stability of the rail infrastructure. Culverts are designed to support the loads imposed without deformation or failure. The track structure (rail, sleepers and ballast) relies on the underlying culvert to provide uniform support.

Regular inspections and maintenance of culverts are essential to ensure they continue to function properly. Blockages, structural damage and wear can lead to failures that affect the track above. The track above a culvert requires regular monitoring to detect signs of settlement or instability caused by issues with the culvert. If a culvert failure is detected, repair of the culvert and restoration of the track structure and geometry is required.

The interdependencies between culverts and track in the CQCN is complex and require consideration and planned coordination during design, construction, and maintenance.

Longitudinal Drainage and Other Rail Infrastructure

Longitudinal Drainage plays a crucial role in managing water runoff along the track and affects various assets and components of the Railway Infrastructure.

Proper longitudinal drainage helps maintain the stability of the track structure by preventing water accumulation in the ballast and subgrade. Excess water can weaken the track bed, leading to settlement or slips or track misalignment.

Well drained ballast remains effective at providing support and distributing the loads. If water is allowed to accumulate, the ballast will become saturated, losing load bearing capacity and leading to track deformation.

Established longitudinal drainage will control ground water levels and surface water runoff, preventing the formation from becoming overly saturated. Saturated formation can lead to reduced shear strength and increase the risk of track deformation. Effective drainage also removes excessive water flow across and down the track structure, reducing erosion of cuttings and embankments and undercutting of the track structure.

Longitudinal Drainage must be integrated with culverts and cross drainage structures. If longitudinal drainage is ineffective, it can lead to blockage in culverts and result in flooding and erosion at crossing points. When water is managed with good longitudinal drainage, then there are fewer issues with track settling, ballast cleaning and other related maintenance tasks.

Water accumulation along the track due to poor longitudinal drainage can lead to track geometry top and line issues and ingress into signalling and telecommunication equipment causing failures, both of which require repairs.

Effective Longitudinal Drainage design and maintenance assists in the performance of the track structure but also enhance the reliability of the rail operations by mitigating the risk of water accumulations in leading to failures and subsequent repairs.

Appendix 3 – Alternate Considerations for Maintenance

The different approaches that Aurizon Network applies in maintaining the rail infrastructure result in the application of maintenance tasks across the system. A summary of alternate considerations used to support each approach is detailed in Table 77.

Table 77 Maintenance Considerations

Activity	Description	Alternative Maintenance Options
Mainline and Turnout Resurfacing	<p>Track settlement occurs in heavy haul railway conditions, presenting as track geometry defects that can result in derailments if not maintained effectively. Track resurfacing is an essential maintenance activity in railways to maintain safe track geometry for rolling stock. Track geometry defects can be symptomatic of an underlying defect, which is creating excessive or rapid track settlement.</p> <p>Multiple resurfacing interventions to maintain safety is a key consideration when determining whether ballast cleaning and formation renewal work is required. Resurfacing activities are currently delivered in a way that provides operational flexibility with these activities currently scheduled after customer train orders. Planned works are delivered in the shadow of other maintenance activities and/or where customer demand permits. Resurfacing scope is both preventive and corrective based.</p>	<ol style="list-style-type: none"> 1. Higher maintenance production / lower cost / high short-term access impact option, provides: <ul style="list-style-type: none"> • Larger blocks of uninterrupted maintenance access planned before trains are pathed • Focuses on plant productivity and cost minimisation • Negatively impacts access providing less flexibility to schedule between train services • Potential to increase response time to TSR's due to a longer planning horizon • Maintenance targets more easily achieved 2. Lower maintenance production / higher cost / low short-term access impact option, provides: <ul style="list-style-type: none"> • Smaller blocks of maintenance access planned between trains • Focus on capacity • Able to take advantage of periods of low demand (or advantageous access due to incidents) to increase production • Harder to meet maintenance targets • Closures utilised to target TSR's <p>Aurizon Network follows option 2 in Blackwater and Goonyella due to availability of access, resources and required performance, whereas in Moura and Newlands, Aurizon Network follows the approach of option 1 as it delivers the most appropriate and balanced outcomes for the supply chain given the resurfacing plant and possessions available in the respective corridors</p>

Activity	Description	Alternative Maintenance Options
Preventive Grinding	<p>Rail grinding is a critical maintenance activity to reduce rail breaks and extend the life of rail.</p> <p>The rail grinding approach through the CQCN seeks to control surface-initiated rail defects under a preventive regime. Intervention thresholds are based on throughput tonnage which are translated into a time-based frequency to allow long-term planning. These frequencies are dictated by the tightness of the curve as rail defects are directly correlated to the dynamic curving forces of trains.</p> <p>Rail grinding is also undertaken in a reactive way to remedy identified rail defects which are initiated from high traction locomotives or other unpredictable mechanisms.</p>	<p>Preventive grinding strategy with a small amount of corrective allowance</p> <p>Corrective rail grinding strategy of allowing rail surface defects to propagate to a severe condition, before reactively programming the rail grinder to perform deep rail grinding to remove the severe defect. This approach would reduce the rail grinding scope however significantly increases the risk that surface defects grow into the rail causing rail breaks. This approach would also restrict long-term planning leading to disruption in the network for unplanned maintenance. Corrective rail grinding also reduces the rail asset life as more rail is removed during rail grinding to remove surface defects and cracks. Corrective rail grinding strategies are adopted in other rail networks that have lower throughput with plenty of maintenance windows or where the demand is seasonal.</p> <p>Aurizon Network currently utilises option 1 across CQCN to ensure high availability and reliability of the rail asset.</p>
General Track	<p>The current inspection approach for General Track is a mix of the Track Recording Car, ATIS, Ultrasonic Test Car, High Rail Vehicle inspections, walking inspections and non-destructive hand testing as detailed in the Asset Maintenance and Renewal Policy.</p>	<p>Reduce Inspection Frequencies - reduce inspection frequencies and revert to additional fix on fail methodology. A move to reduce the frequency of inspections would require consultation and approval from the Rail Safety Regulator. This option is not recommended and would likely lead to an increase in unplanned delays and increased cost to rectify in an unplanned manner.</p> <p>Operational Intervention - to reduce the impact of high priority defects, Aurizon Network can apply temporary restrictions to manage risks e.g., Temporary Authorised Non-Conformance, Temporary Speed Restrictions, Axle Load Restrictions or rerouting of loaded and empty trains. These interventions can be localised to the defect to keep the rail line open whilst working with the above rail operators to find a least impact time to rectify the defect. Whilst this keeps the rail line open, this will potentially impact operational performance and could result in unplanned closures if the defect changes.</p> <p>Aurizon Network currently utilises option 2 across CQCN as it delivers the most appropriate outcomes for the supply chain.</p> <p>Aurizon Network will be phasing in ATIS as a replacement to the Track Recording Car.</p>

Activity	Description	Alternative Maintenance Options
Control Systems	<p>Maintenance is based on defined time-based inspections of equipment items (e.g., points, level crossings) and of equipment enclosures and power supplies.</p> <p>The frequency of inspection varies between equipment types and is based on failure modes and criticality.</p> <p>Frequency and tasks are reviewed annually for effectiveness based on observed asset condition, fault performance, and impact on rail services.</p>	<p>Maintain only on failure – not recommended and would likely lead to an acceleration of faults which will reduce the reliability of the systems which in turn reduces the capacity of the railway.</p> <p>Planned frequency - the current planned frequencies are reviewed on an annual basis to align the required inspections to the condition of the assets. Frequencies and activities are adjusted where it is believed that the in-service performance will be materially improved. Any change to the inspection frequencies requires consultation and approval from the Rail Safety Regulator</p> <p>Increased inspection frequency and/or accelerated replacement and refurbishment to reduce the likelihood of service affecting failures - this is not recommended outside of the annual review of planned frequencies and would increase the cost of control systems maintenance. Any change to the inspection frequencies requires consultation and approval from the Rail Safety Regulator.</p> <p>Aurizon Network currently utilises option 2 in line with its guiding principles of identifying and correcting defects before they become service disrupting faults</p>
OHLE and Power Systems	<p>The Electrical Safety Act in Queensland requires that a Prescribed Entity, such as Aurizon Network, ensures that the asset is operated in a way that is electrically safe. This includes managing the high voltage electrical assets through effective maintenance and renewals activities.</p> <p>Maintenance is predominantly based on defined time-based inspections of equipment items (e.g., overhead lines, transformers, isolators, etc).</p> <p>The frequency of inspection varies between equipment types and is based on failure modes and criticality.</p> <p>Frequency and tasks are reviewed for effectiveness based on observed asset condition, fault performance, and impact on rail services.</p> <p>The maintenance frequency is defined in the Asset Maintenance and Renewal Policy, and forms part of the RIM accreditation.</p>	<ol style="list-style-type: none"> 1. Maintain only on failure – not recommended: expect to see an acceleration of faults as asset condition drifts from an acceptable performance level. Move to a fix on fail approach would lead to more component failures and dewirements, potentially resulting in a notification of a dangerous electrical event to the Electrical Safety Regulator. 2. Planned frequency - the current planned frequencies are reviewed on an annual basis to align the required inspections to the condition of the assets. Frequencies and activities are adjusted where it is believed that the in-service performance, including safety outcomes, will be materially improved. Any change to the inspection frequencies requires consultation and approval from the Rail Safety Regulator. 3. Increased inspection frequency and/or accelerated replacement and refurbishment to reduce the incidence of service affecting failures: not recommended outside the annual maintenance process review and would increase the cost of power systems maintenance. <p>Aurizon Network currently utilises option 2 in line with its guiding principles of identifying and correcting defects before they become service disrupting faults</p>

Appendix 4 – Options for Renewal Approach

When an asset is presenting for renewal, several options are worked through to determine the renewal approach. Figure 64 describes these options.

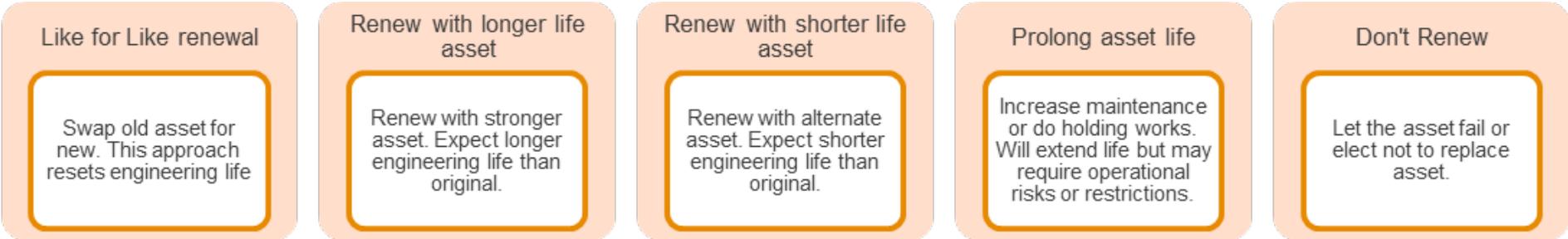


Figure 64 Asset Renewal Options

Table 78 through to Table 92 align these 5 options with each of the asset classes.

Rail Renewal is the standalone replacement of rail in a section of track due to fatigue (increased defect occurrence rate) and/or wear. The timing of renewal is dependent on the weight of the rail, its location in track (loaded / unloaded, on straights or curves), rail compassion (head-hardened, standard carbon on through-head hardened) and forecast tonnage

Table 78 Rail Renewal Options

Option	Description	When Used
Renew with like for like asset	Like-for-like renewal looking to re-life asset.	Majority of rail renewals are like-for-like replacements for mainline tangents and curves and passing Loops, Mine and Unloading Balloon Loops, Station Yards and sidings. This is undertaken when traffic task and performance are kept constant.
Renew with longer life asset	On renewal install rail of higher quality or properties to achieve longer life on installed asset.	Renewing 60kg standard carbon rail with higher quality 60kg variant (i.e., head-hardened or through-head-hardened). Renewing aged 53kg rail and renewing with 60kg rail variant. This is more common in Mine and Unloading Loops, Station Yards and sidings where older rail exists (i.e., lesser quality and size).

Option	Description	When Used
		This is undertaken when traffic task is constant or increasing and performance is to be kept constant or improved.
Renew with shorter life asset	On renewal install rail of lower quality or properties to install fit for purpose asset matching asset life to required task.	Renewing rail in low traffic mine balloons and areas or sidings with cascaded part-worn rail Renewing aged 60kg rail with a lower quality 60kg variant. (i.e., standard carbon rail) Undertaken when future traffic task and operational environment is uncertain.
Increase maintenance to prolong asset life	Tangents: Increase Ultrasonic Testing frequency (closure rails). General: Additional rail grinding, temporary plating of breaks or spot resurfacing to prolong period to required renewal Replace worn or fatigued rail as a reactive renewal. Use part-worn material with lesser life where appropriate.	To carry asset to planned future renewal point or known end of life point Can only be held to a point, once head wear goes below renewal trigger risk of asset failure increases along with associated service disruption, reactive renewal is required.
Choose not to renew	Not applicable unless Operational Risk measures taken. Increase Maintenance Activities and impose corridor restrictions to manage impact of traffic.	Rail repairs will increase with part-worn closure rails. Increase Ultrasonic Testing related to defect rates to monitor degradation of the rail condition.

Rail renewal can also be completed as part of Track Upgrade scope where more than one element of the permanent way assets is renewed together, for example rail and sleepers.

Table 79 Sleeper Renewal Options

Option	Description	When Used
Renew with like for like asset	Like-for like renewal looking to re-life asset in a row for a section of track.	Sleeper renewal like-for-like replacements where new sleeper and fasteners being installed are the same as the existing. Generally, this relates to 28tal concrete sleeper with Pandrol e-clip or fast clip. Like-for-like replacement of sleepers can also include using galvanised fasteners to replace older style fist clip fasteners and higher quality pads and insulators which are the modern-day equivalent. Replacing timber with new timber sleepers is also like-for-like Renewal. This is undertaken when traffic task and performance are kept constant.

Option	Description	When Used
Renew with longer life asset	On renewal, install sleeper of higher quality or properties to achieve longer life on installed asset.	Renewing 22.5tal Concrete Fist Sleepers with new 28tal Concrete Pandrol e-clip sleepers. Replacing timber sleepers with new full depth or 30tal or 20tal low profile concrete sleepers. Replacement of Steel Sleepers with full depth concrete sleepers is a renewal with a longer life asset. This is undertaken when traffic task is constant or increasing and performance is to be kept constant or improved.
Renew with shorter life asset	Renewal in a section of track with new or part-worn concrete sleepers.	Renewal of timber or concrete sleepers with part-worn sleepers, or low-profile concrete sleepers that would have a reduced life. This may occur in yards, sidings or branches with reduced traffic. This undertaken when future traffic task and operational environment is uncertain.
Increase maintenance to prolong asset life	To prolong the life of the sleepers, cluster management rather than the full section renewal is undertaken Cluster management can be undertaken using new or part-worn concrete full depth sleepers or low-profile concrete sleepers in an interspersed pattern. As fastener and component deteriorate, replacement will occur through maintenance to improve holding the rail to the sleepers.	To carry asset to planned future renewal point or known end of life point. Cluster management of defective and damaged sleepers can only be held to a point. Once a cluster of defective sleepers go above the sleeper replacement limits in standards the risk of asset failure increases along with associated service disruption. Inspections will be increased to monitor the condition of the sleeper asset Speed restrictions may be imposed to prolong the life of the sleepers with the reduction in operational speed and loading.
Choose not to renew	Increase inspections, reactive repairs and cluster management with like-for-like spot replacement to keep within engineering standards. Repair and replace fasteners through maintenance when defective.	Defective and damage sleepers are monitored at an increased frequency Speed and load restrictions may be imposed to manage the deteriorated condition. This is triggered as a corridor is approaching economic end of life.

Sleeper renewal can also be completed as part of Track Upgrade scope where more than one element of the permanent way assets is renewed together, for example rail and sleepers.

Table 80 Turnout Renewal Options

Option	Description	When Used
Renew with like for like asset	New modern day equivalent full turnout renewal like-for-like or major turnout component renewal life-for-like.	<p>This is when the renewed turnout is the same angle, crossing, rail and sleepers e.g., 1 in 12, 60kg/m Rail Bound Manganese (RBM) on concrete sleeper turnout is replaced with a 1 in 12 60kg/m RBM on concrete sleeper turnout.</p> <p>This is also for major component replacement when replaced like with like such as Swing Nose Crossing (SNX) to SNX.</p> <p>This is undertaken when traffic task and performance are kept constant.</p>
Renew with longer life asset	New full turnout renewal which is an upgrade from the existing turnout with at least one parameter of crossing rate, rail size, crossing type, or type of sleepers being a higher standard than existing and the others remaining the same.	<p>This is when a turnout renewal increases the crossing rate from 1 in 12 to 1 in 16 or a change to the crossing from RBM to SNX, 53kg/m rail to 60kg/m rail.</p> <p>This is undertaken to improve performance of the asset and efficiency of operation and may be required as traffic task/operational environment changes.</p>
Renew with shorter life asset	Repair/replace components as required.	<p>Planned major component replacement will renew parts of the asset as they deteriorate over time. The turnout is not fully renewed.</p> <p>This is undertaken when future traffic task and operational environment is uncertain.</p> <p>Formation failures may drive full upgrade and therefore shorter life replacement not possible.</p>
Increase maintenance to prolong asset life	Increase inspections, maintenance repairs and servicing, repair/replace components as part of reactive maintenance.	<p>To carry asset to planned future renewal point or known end of life point</p> <p>Can only be held to a point, once component wear goes below renewal trigger, risk of asset failure increases along with associated service disruption. Reactive replacement of components is required.</p>
Choose not to renew	Turnout condition is deteriorating however speed and operational restrictions are imposed to manage the condition.	<p>This is used for low tonnage and low traffic lines when the turnout condition is deteriorating but has not failed its primary function.</p> <p>This is triggered as corridor is approaching economic end of life.</p>

Table 81 Ballast Mainline and Turnout Renewal Options

Option	Description	When Used
Renew with like for like asset	<p>Ballast renewal on a face with the high production machine. Intended to include an effective combination of corrective and preventive ballast renewal, linked to asset condition and performance.</p> <p>Typical approach is for ballast replacement to be a combination of new and screened ballast, varying from site-to-site as appropriate. Functionality of the RM902 enables screening in comparison to excavator undercutting and bridge rollouts where only new ballast is introduced. New ballast will provide ballast characteristics of the highest integrity whilst screened ballast seeks (as far as is practical) to remove fouling material and smaller particles from track and return the larger particles. Wet weather can compromise the effectiveness of screening.</p>	<p>Mainline ballast undercutting machine (BCM or RM902) ballast cleaning and replacement of large scopes, typically in the range of 900m-5km. Complimented with excavator undercutting for smaller scopes and/or gaps in large scopes.</p> <p>This is undertaken when traffic task and performance are kept constant.</p>
Renew with longer life asset	<p>This option seeks too either:</p> <ul style="list-style-type: none"> Renew the full ballast profile with new ballast, that is, no screening. Transition from ballasted track to slab-track (i.e., no ballast) where the rails are fastened to an extended length of concrete. This solution has been used at Cooling Channel Bridge within the Callemondah and Gladstone Port precinct. 	<p>This option will be used where the condition of the ballast is such that it is unable to be screened due to the inability to effectively remove fouling material and/ or the ballast is degraded to the extent it is unable to perform its required function (e.g., rounded ballast). The mainline ballast undercutting machine (RM902) can be used for the renewal of large scopes, typically in the range of 900m-5km, whilst the excavator undercutter is utilised for smaller scopes and/or gaps in large scopes where the large machine is unable to reach.</p> <p>Slab track is used where the adjacent physical infrastructure and/ or the operational paradigm at the location is such that ballast degradation (i.e., rate of change of condition) has a sustained and detrimental impact on performance and maintenance and renewal efforts. The transition to slab track eliminates coal fouling impacts on ballast performance and the associated operational impacts.</p> <p>This is undertaken when traffic task is constant or increasing and performance is to be kept constant or improved.</p>
Renew with shorter life asset	<p>Ballast renewal is limited to screening only, performed on a face by the high production machine or the utilisation of excavator undercutting in short sections only. Intended to reduce fouling and restore ballast size distribution, but not</p>	<p>This is undertaken when future traffic task and operational environment is uncertain</p> <p>Ballast renewal is anticipated to be more viable in scenarios where coal contamination is low-moderate, but ballast particle degradation is moderate-high, producing a more screenable material (i.e., loaded, high MGT track, not near loading or unloading facilities / mines and ports). Alternatively, it is potentially viable where the ballast depth is high and</p>

Option	Description	When Used
	<p>necessarily equivalent to new ballast fouling levels (PVC) and ballast material specifications.</p> <p>Not viable in all locations, where the material is unscreenable (due to moisture and material characteristics such as fouling composition).</p> <p>Ballast shoulder cleaning only, performed on-a-face to aid ballast drainage.</p> <p>Not viable in all locations, where the material is unscreenable (due to material characteristics such as fouling composition).</p>	<p>only the top approximately 300mm of less coal/clay contaminated material is screened. The result would correspond with a reduced economic life</p> <p>Ballast shoulder cleaning is anticipated to be more viable in scenarios where the shoulders are moderately to highly fouled, and the ballast shoulder cleaner is still able to process the material. Potentially more suited to locations where the source of coal contamination is from the top of wagons, falling to the shoulders, rather than carry back from ports which results in fouling more focussed toward the track centre (i.e., Loaded track or duplicated track adjacent to loaded track, in close and moderate proximity to loading facilities/mines). The result is an anticipated minor improvement in track drainage and therefore we anticipate an increased resilience to wet weather impacts.</p>
Increase maintenance to prolong asset life	<p>Perform increased resurfacing and reactive maintenance mudhole dig outs only (increased maintenance costs/requirements)</p> <p>Train speed restrictions to reduce dynamic forces.</p> <p>For turnouts: Increased partial dig outs, focussing on the highest fouling/poorest geometry locations (typically around the switch and the vee)</p> <p>For Non-electrified infrastructure: Increase the depth of ballast (up to 500mm) with additional clean ballast drops. Intended to improve load transfer to fouled ballast, decrease settlement and improve drainage compared to fouled ballast alone, decreasing the rate of resurfacing and dig outs in the short to mid-term.</p>	<p>To carry asset to planned future renewal point or known end of life point</p> <p>Performance of track with poor condition ballast is managed by more frequent resurfacing to restore geometry, as well as reactive mudhole dugouts where (note that resurfacing is not effective in managing geometry local to mudholes).</p> <p>Consider maintenance resources in western districts. Speed Restrictions may be imposed to prolong the life of the ballast with the reduction in operational speed and loading.</p> <p>Performance of track with poor condition ballast is managed by adding new clean ballast on top of fouled ballast, typically by ballast train and mechanised resurfacing. Likely to be effective or more suited to when fouled ballast in the depth range of up to 300mm is increased by approximately 100mm to 400mm. Beyond c.500mm ballast depth, negative impacts to track stability are believed to outweigh the benefits of increased clean ballast.</p>
Choose not to renew	<p>Perform a standard rate of resurfacing, with typically an increase in the rate of mudhole dig outs to manage operational impacts from not performing renewals.</p>	<p>This is triggered as corridor is approaching economic end of life</p> <p>Intervention by ballast dig outs and resurfacing is typically only adopted when operational risk or impacts are above appetite.</p> <p>An alternative lever in addition to ballast [mudhole] dig outs may be to place 20mm aggregate in mud holes to improve ballast interlocking and reduce the rate of settlement as a lower cost / impact option, more suited to short to mid-term situations.</p>

Table 82 Bridge Ballast Renewal Options

Option	Description	When Used
Renew with like for like asset	Full Bridge Ballast Rollout (C20) which may include upgrades or renewals to rail, sleeper or formation renewals to align remaining asset lives. Includes curb raising and bridge modifications to achieve minimum 300mm ballast requirements.	<p>This is undertaken when traffic task and performance are kept constant</p> <p>Overall ballast condition is very fouled with rough track. Bridges with poor maintainability due to height, access (no handrails) and length.</p> <p>For non-mainline track sections, bridges to be rolled out at poor condition where visible deterioration of ballast and shorter planning horizons are acceptable. Lower dependency on condition-based renewal because of acceptance of lower reliability.</p>
Renew with longer life asset	Not applicable. As Bridge Rollouts are a 100% replacement of ballast there is no longer life asset option.	N/A
Renew with shorter life asset	<ul style="list-style-type: none"> Partial Bridge Ballast Rollout (C20) which will only include ballast replacement Curb raising and ballast depth lift. <p>Partial bridge ballast renewal by vac truck. Explore: Rail mounted vac truck. Currently being imported by LORAM.</p>	<p>This is undertaken when future traffic task and operational environment is uncertain.</p> <ul style="list-style-type: none"> Removes fouled track and reduces material costs for the renewal activity. Formation is not renewed unless catastrophically failing. Raise the ballast depth across the bridge without removing fouled ballast. Only applicable to ballast with shallow depths where this has not been performed before. Rail mounted vac truck, low production machine that can fit across the bridges. Remove sections of contaminated ballast on bridges, top up ballast as required and resurfaced. This is a technical solution to align asset life with economic life that has not been employed in the CQCN to date and is still being investigated.
Increase maintenance to prolong asset life	<p>Perform mudhole dig outs, resurfacing or introduce smaller aggregate to increase asset life. Increase detailed inspections of bridge ballast.</p> <p>Increase the depth of ballast (up to 500mm) with additional clean ballast drops. Intended to improve load transfer to fouled ballast, decrease settlement and improve drainage compared to fouled ballast alone, decreasing the rate of resurfacing and dig outs in the short to mid-term. Note that height and stagger of over heads will need to be check and adjusted as required.</p> <p>Explore: Rail mounted vac truck. Currently being imported by LORAM.</p>	<p>To carry asset to planned future renewal point or known end of life point.</p> <p>For long bridges with sections of severe ballast fouling only. Mudhole replacement is expected to extend the life of the remaining bridge ballast.</p> <p>This option differs from B due to curb raising already installed and available.</p> <p>Spot ballast replacement with hi-rail vac truck. Less invasive and lower safety requirements to remove mudholes on bridges.</p>

Option	Description	When Used
Choose not to renew	BAU – perform mechanised resurfacing based on track geometry thresholds Increased inspections, TSRs and spot ballast renewals Add small aggregate to improve ballast integrity.	Depends on asset condition and financial life. Operational restricts and maintenance become ineffective after prolonged periods of time. Will lead to shut truck.

Table 83 Structure Renewal Options

Option	Description	When Used
Renew with like for like asset	Replace existing structure with like-for-like based on waterway size E.g. - Replace culverts and other structures with same waterway size assets.	This is the preferred renewal option when the structure that requires renewal still meets the hydrology requirements for the site when traffic task and performance are kept constant.
Renew with longer life asset	Strengthen or replace existing structures with 300LA Load Rates structures E.g. - Remove and replace existing culverts with 300LA RCBC or Reinforced Concrete Pipe (RCP) units.	This is the preferred renewal option when the structure requiring renewal was originally designed to a lesser standard than current standard and when traffic task is constant or increasing and performance is to be kept constant or improved.
Renew with shorter life asset	All new structures are renewed with 300LA Load Rating structures Culverts and other structures: e.g., install a Corrugated Metal Pipe (CMP) which has a shorter life span online with reducing demand and defined remaining life.	For safety reasons, this option is not pursued for Bridges. <ul style="list-style-type: none"> This option can be considered with a variation to standard practice where corridors have lower tonnages and forecast declining demand.
Increase maintenance to prolong asset life	Complete maintenance inspections and repairs annually to maintain safe operating conditions. Propping and speed restrictions may be required to manage condition of the assets. Renewal will occur when condition has deteriorated to a point where the risk of failure is considered unreasonable.	This option may be considered fit for purpose in circumstances when future traffic task and operational environment is uncertain. This option requires regular inspections to collect condition data and will increase maintenance costs over the remaining life of the asset to ensure safe rail operations and time to maintain the structure to an acceptable standard.
Choose not to renew	The structure remaining life based on condition is within the life of the rail line above it, or remaining demand for the line.	This option can be considered if a structure is no longer required for safe operation of the rail network. This could apply for culverts that are no longer to provide corridor drainage to

Option	Description	When Used
		meet flood immunity requirements or when the line is expected to be closed prior to the remaining life of the asset. This strategy may or may not lead to additional maintenance costs depending on the condition and remaining life of the asset.

Table 84 Formation Renewal Options

Option	Description	When Used
Renew with like for like asset	Renew formation to Aurizon specification, typically 600mm depth, with 50-year design life.	This is the default option for renewal of formation and is undertaken when traffic task and performance are kept constant.
Renew with longer life asset	Renew with formation with longer design life.	This option only applies in scenarios when the formation to be replaced is of lesser standard than Aurizon specification (50 years).
Renew with shorter life asset	Renew with formation with shorter design life. The following techniques provide a shorter design life where relevant: <ul style="list-style-type: none"> • Application of shear keys for formation failures. • Reduction in capping layer thickness • Lime slurry pressure injection • Cement stabilisation. 	This is undertaken when future traffic task and operational environment is uncertain. A shear key (applied to resist lateral sliding failure of the formation) may only be used at a location for up to 2 years. The other techniques are not Aurizon Network standard practice but are investigated for specific location conditions and expected life of the corridor.
Increase maintenance to prolong asset life	Extend formation life through preventive actions: <ul style="list-style-type: none"> • Preventive drainage program • Ballast renewal • Increase the depth of ballast 	To carry asset to planned future renewal point or known end of life point The extent to which formation life can be extended via a preventive drainage program is subject to a review and design, of program specific to the local conditions Ballast options will reduce stress on the formation and further reduce the track geometry deterioration to prevent differential permanent settlement in both the ballast layer and the formation beneath, which may ultimately prolong the useful life of the formation.
Choose not to renew	Manage existing formation through operational actions: <ul style="list-style-type: none"> • Apply speed restrictions • Reduce axle load allowance • Heavy resurfacing, shear keys and drainage works 	This is triggered as corridor is approaching economic end of life.

Table 85 Level Crossing Options

Option	Description	When Used
Renew with like for like asset	Renewal of Level Crossings with like-for-like components or properties as per current Aurizon Network standards.	This is the default option for renewal of level crossings and is undertaken when traffic task and performance are kept constant.
Renew with longer life asset	Two options to renew asset with longer life asset: 1. Renewal of Level Crossings with higher quality components or properties as per current Aurizon Network standards to achieve longer asset life. 2. Upgrade of Level Crossings from passive to active controls either to primary flashing lights or flashing lights and half boom gates.	<ul style="list-style-type: none"> Option 1 can be considered when the level crossing to be renewed was constructed to a lower standard (e.g., replace black steel sleepers/fastenings with new galvanised sleepers and fastening systems, installing flangeways to reduce grease retention on road surfaces and to facilitate rail grinding works at level crossings, increasing effective drainage around level crossings by upgrading culverts and installing megaflo and tracktex to reinforce formation material). Option 2 will apply when a level crossing has inadequate sighting distances - This mainly applies to public crossings where major road usage with long vehicles has changed over time.
Renew with shorter life asset	Renewal of Level Crossings achieving shorter design life through partial renewal – replacement of selected components only.	<p>This option will only be considered if it does not affect the safety of the level crossing</p> <p>This is undertaken when future traffic task and operational environment is uncertain</p> <p>Partial renewal can involve replacing two or more components but not including formation</p> <p>When Formation failure is causing rapid deterioration of track geometry, formation renewal can extend the life of the level crossing. Rail, sleepers and other components can be reused.</p>
Increase maintenance to prolong asset life	Perform maintenance to rail, ballast and drainage to extend the life of the crossing.	<p>This option can be considered in corridors with relatively low tonnages and includes:</p> <p>Inspection and monitoring to ensure that asset component replacement is not required.</p> <p>Condition based maintenance intervention – i.e., ballast replaced when fouled at approaches rather than when the ballast has failed.</p>
Choose not to renew	Decommission level crossing if appropriate. Divert traffic to alternative level crossings, lower accessibility to corridor.	This option can be considered if the level crossing has very low traffic and can be safely decommissioned and traffic diverted to a nearby Level Crossing with minimal impact on the user.

Table 86 Access Road Renewal Options

Option	Description	When Used
Renew with like for like asset	Renew assets to like-for-like standard or modern-day equivalent to provide safer access to the rail corridor.	When traffic demand is consistent and certain, and the renewal reduces required maintenance and/or increases accessibility to the rail corridor.
Renew with longer life asset	<p>Renew to a higher standard of asset</p> <ul style="list-style-type: none"> For access roads, renew to type 1 (i.e., positioned at formation level of the track) from type 2 (i.e., adjacent to the track at natural ground level or similar) For access points, upgrade road surface, signage and drainage to a higher standard <p>For corridor security, upgrade from stock fencing to a higher standard for a longer life asset.</p>	This option is considered when existing access roads do not meet current Aurizon Network Corridor Access Road standards.
Renew with shorter life asset	Renew small sections or minor components, as part of reactive renewals to the current standards.	This option can be considered for access roads with reducing usage or when condition has deteriorated further than maintenance can manage, and a level of reactive renewal is required.
Increase maintenance to prolong asset life	Perform maintenance, manage vegetation and improve drainage to extend life of the access road.	This option can be considered when existing access road is overall fit for purpose and its more cost effective to repair than replace.
Choose not to renew	Remaining asset life is in line with remaining track asset life and is fit for purpose (local landholder considerations).	When existing maintenance schedule is sufficient to maintain assets fit for purpose status.

Table 87 Telecommunications Renewal Options

Option	Description	When Used
Renew with like for like asset	Like-for-like renewal looking to replacing an asset with same performance.	<p>This is undertaken when traffic task and performance are kept constant.</p> <p>For telecom structures and equipment rooms, this option will be chosen if the asset condition is beyond refurbishment potential</p> <p>This option is typically pursued when replacing assets such as Generators, Dehydrators and Batteries</p> <p>This option may also be chosen if spares are exhausted, or there is a risk of major component failure.</p>

Option	Description	When Used
Renew with longer life asset	One renewal, install equipment signalling of higher quality or properties to achieve longer life on installed asset.	<p>This is undertaken when traffic task is constant or increasing and performance is to be kept constant or improved</p> <p>This is the preferred option for renewal of older fibre-optic cables in the CQCN (with design life of 30 years). These cables are subject of an annual renewal programme with modern fibre-optic cables with improved capacity and longer expected life (design life of 50 years)</p> <p>This option can also be considered when renewing batteries, as higher capacity options are becoming available.</p>
Renew with shorter life asset	Replacing an asset with a lower specification.	<p>This option can be considered for certain types of assets in corridors with lower tonnages and forecast declining demand.</p> <p>The option may be considered on small and secure sites, e.g., Equipment Room – use of cabinets on external skids as opposed to constructed structures, and use of portable generators.</p>
Increase maintenance to prolong asset life	Increase inspection and repair or replace components as part of reactive maintenance.	<p>To carry asset to planned future renewal point or known end of life point.</p> <p>For Telecommunication assets, preventive maintenance typically keeps the asset operating within limits and does not prolong life. Additional condition monitoring, however, can detect problems before they impact asset life.</p> <p>This option may be considered for assets such as telecom structures for which repairs can prolong life.</p>
Choose not to renew	Systems decommissioning.	<p>This option will be considered for assets which are no longer required to fulfill a certain function in the corridor.</p> <p>As improved optical fibre is deployed, the need for Time-Division Multiplexing (TDM) systems will progressively be eliminated. The asset management plan for TDM systems is therefore based on progressive elimination rather than renewal.</p>

Table 88 Signaling Renewals Options

Option	Description	When Used
Renew with like for like asset	Involves the replacement of the asset and the same make and model or equivalent.	<p>Replacement usually occurs at the end of the design life or at failure when the equipment cannot be repaired.</p> <p>This is the default option for Signalling equipment renewals.</p>

Option	Description	When Used
		This is undertaken when traffic task and performance are kept constant.
Renew with longer life asset	Involves the replacement of an asset with a new make or model that has a greater design life.	<p>This option applies when the original equipment cannot be replaced like-for-like with the same design life because of new technology or obsolescence.</p> <p>There are limited opportunities to pursue this option for Signalling assets as they are designed to specified standards.</p> <p>This is undertaken when traffic task is constant or increasing and performance is to be kept constant or improved.</p>
Renew with shorter life asset	Involves the replacement of an asset with a new make/model that has a lesser design life.	There are limited opportunities to pursue this option for Signalling assets as they are designed to specified standards.
Increase maintenance to prolong asset life	Involves the increase of maintenance interventions to keep asset running past its design life.	<p>For Signalling assets, preventive maintenance typically keeps assets operating within limits and does not prolong life. Additional condition monitoring, however, can detect problems before they impact asset life.</p> <p>This option can be considered when there are sufficient spares available. For some Signalling assets, components from previously renewed assets are retained as spares for the remaining assets e.g., interlocking. Additionally, for Interlockings, individual relays can be replaced, rather than the renewing the whole interlocking.</p>
Choose not to renew	Systems decommissioning.	<p>This option will be considered for assets which are no longer required to fulfill a certain function in the corridor.</p> <p>This option could be considered if for example a level crossing is no longer required or if new technology has made the old system redundant.</p>

Table 89 Asset Protection Renewal Options

Option	Description	When Used
Renew with like for like asset	Involves the replacement of the asset and the same make and model or equivalent.	<p>Replacement usually occurs at the end of the design life or at failure when the equipment cannot be repaired.</p> <p>This is the default option for Asset Protection equipment renewals.</p> <p>This is undertaken when traffic task and performance are kept constant.</p>
Renew with longer life asset	Involves the replacement of an asset with a new make or model that has a greater design life.	This option applies when the original equipment cannot be replaced like-for-like with the same design life.

Option	Description	When Used
		<p>Obsolescence can drive the need to replace with an asset that may have a longer design life.</p> <p>To improve operational reliability, track circuits are often replaced by axle counters, that may result in a longer life asset</p> <p>This is undertaken when traffic task is constant or increasing and performance is to be kept constant or improved.</p>
Renew with shorter life asset	Involves the replacement of an asset with a new make/model that has a lesser design life.	There are limited opportunities to pursue this option for Asset Protection assets as they typically have a limited design life of 10-15 years.
Increase maintenance to prolong asset life	Involves the increase of maintenance interventions to keep asset running past its design life.	<p>For Asset Protection, preventive maintenance typically keeps assets operating within limits and does not prolong life. Additional condition monitoring, however, can detect problems before they impact asset life.</p> <p>This option can be considered when there are sufficient spare available.</p> <p>To carry asset to planned future renewal point or known end of life point.</p>
Choose not to renew	Systems decommissioning.	This option could be considered for assets which are no longer required to fulfill a certain function in the corridor, e.g., track circuits made redundant because of the introduction of axle counters.

Table 90 Overhead Line Equipment Renewal Options

Option	Description	When Used
Renew with like for like asset	Like-for-like renewal – replacing a life expired asset with an identical unit, or a modern equivalent, which will deliver the same level of performance.	<p>This is undertaken when traffic task and performance are kept constant.</p> <p>Some areas of the OHLE in the CQCN are life expired and like-for-like replacement of components and structural steelwork is appropriate. The Goonyella Ports OHLE which is affected by significant corrosion due to its coastal environment is an example of this. However, overall, the OHLE in the CQCN is only at half-life. There are no current plans to renew this asset across the entire CQCN as it still has another (approx.) 35 years of life left.</p>
Renew with longer life asset	On renewal, install OHLE of higher quality or properties to achieve longer life on installed asset.	Not relevant to the OHLE – see comments above.

Option	Description	When Used
Renew with shorter life asset	Renew life-expired components with second-hand components which meet the required service life for the application.	This is undertaken when future traffic task and operational environment is uncertain and suitably rated second-hand components are available.
Increase maintenance to prolong asset life	Increase inspection and repair or replace components as part of reactive maintenance.	To carry asset to planned future renewal point or known end of life point. Inspections can identify key components (normally small parts) requiring renewal Many of these components have a shorter service life than the overall asset. Note that masts have a service life of 80+yrs, conductors 70yrs, insulators 50yrs, small parts circa 30 years.
Choose not to renew	This option will be considered for assets which are no longer required to fulfill a certain function in the corridor.	This option can be considered for end-of-life branch-line that is no longer required to support Electric locomotive traffic.

Table 91 Power System Renewal Option

Option	Description	When Used
Renew with like for like asset	Like-for-like renewal – replacing a life-expired asset with an identical unit, or a modern equivalent, which will deliver the same level of performance.	This is the default option for Power systems renewals and is undertaken when traffic task and performance are kept constant Replacement usually occurs at the end of the design life or at failure. This is used when the expected corridor life exceeds the expected asset life (e.g., an autotransformer on the Goonyella trunk).
Renew with longer life asset	Involves the replacement of an asset with a new make or model that has a greater design life.	If longer life assets are available, this option can be considered for secondary system assets (DC supplies, protection relays). Rarely used with primary equipment as these assets typically have a service life of 40-50 years. This is undertaken when traffic task is constant or increasing and performance is to be kept constant or improved.
Renew with shorter life asset	Renew life-expired components with second-hand components which meet the required service life for the application.	This is undertaken when future traffic task and operational environment is uncertain. The required remaining service life for the asset is less than the service life of a new component, and suitably rated second-hand components are available.
Increase maintenance to prolong asset life	Increase inspection and repair/replace components as part of reactive maintenance.	This option can be considered for Transformers which may have their service life extended by a process called “oil regeneration” if the asset is in a suitable condition for this treatment.

Option	Description	When Used
Choose not to renew	This option will be considered for assets which are no longer required to fulfill a certain function in the corridor.	This option can be considered for end-of-life branch-lines where a renewed asset's life would greatly exceed the forecast corridor life.

Table 92 Traction Substation Renewal Options

Option	Description	When Used
Renew with like for like asset	Like-for-like renewal – replacing a life-expired asset with an identical unit, or a modern equivalent, which will deliver the same level of performance.	This is the default option for renewals of traction substations and is undertaken when traffic task and performance are kept constant.
Renew with longer life asset	Involves the replacement of an asset with a new asset that has a greater design life.	N/A
Renew with shorter life asset	Renew life-expired components with second-hand components which meet the required service life for the application.	This option may be considered for traction substation componentry where a full renewal of the substation is not recommended. This is undertaken when future traffic task and operational environment is uncertain.
Increase maintenance to prolong asset life	Increase inspection and repair or replace components as part of reactive maintenance.	This option may be considered for traction substations serving corridors with lower tonnages and forecast declining demand.
Choose not to renew	This option will be considered for assets which are no longer required to fulfill a certain function in the corridor.	This option can be considered for end-of-life branch-lines where a renewed asset's life would greatly exceed the forecast corridor life. The substations on the Bauhinia line (Struan Rd Feeder Station and Kinrola TSY) are examples of this.

Appendix 5 – Description of Practices Used to Carry Out Asset Activity

This section provides a description of the key maintenance activities, maintenance practices and renewal activities that are used to carry out asset activity. It also provides a general overview of:

- the benefit of completing the works
- the risks mitigated; and
- the relevant trigger for intervention.

Maintenance Activities

Table 93 Summary of CQCN Maintenance Activities

Activity	Description	Benefits and Risks Managed	Trigger for Intervention	Access Management
Resurfacing	Restores geometry of the track and turnouts by lifting and lining to the appropriate level and alignment and compacting the ballast underneath the sleepers.	Mitigates the need for temporary speed restrictions applied as a risk control prior to component renewal or full asset renewal.	Triggered by tonnage over a rail section. Track resurfacing: 50 million gross tonnes (MGT) Turnout resurfacing: 80 MGT Resurfacing to remedy geometry faults identified often required ahead of these limits.	Resurfacing tasks are typically managed between trains and planned after the ITP (Intermediate Train Plan) has been agreed. This minimises the impact to capacity and allows the work to be targeted for priority locations.
Rail Grinding	Grinding rail in track and turnouts to remove micro cracks and small surface faults from the rail, restoring a profile that spreads the contact band, and positions it for better wheel set tracking around the curves.	Reduces risk of severe defects (rail failure or breakage) and prolongs the life of the rail.	Triggered by tonnage over a rail section or curve. Straights: 40 MGT Curves 1001m to 2500m radius: 40 MGT Curves less than 1000m radius: 20 MGT	Annual programs are developed and negotiated to avoid conflicts with other regulated inspection vehicles.

Activity	Description	Benefits and Risks Managed	Trigger for Intervention	Access Management
General Maintenance	<p>Track Encompasses the planned corrective maintenance effort, responding to faults identified by drivers, track inspection, specific asset inspection, and Track Recording and Rail Flaw Detection inspections. Activity can be planned according to the severity and the time for fault/fault remedy of the identified fault.</p> <p>Fault severity ranges from:</p> <ul style="list-style-type: none"> • Immediate - Track closed until repair completed; to • 'Y1' – repair required within 1 year of identification. 	<ul style="list-style-type: none"> • Identification of faults through inspection – notification and prioritisation managed via SAP to minimise impact on capacity • Faults managed to mitigate against infrastructure failure leading to unplanned outages • Localised depots responding to infrastructure faults to reinstate operability of the network in a controlled manner. 	<p>Turnouts: 40 MGT</p> <p>Time based inspection regimes for track geometry recording, ultrasonic testing and track inspections.</p> <p>Planned corrective dependent on fault severity.</p>	<p>Tasks are planned in accordance to Network Maintenance Block rules. Predominately on nominated maintenance days or in shadow of existing renewal works.</p>
Other Maintenance	<p>Civil</p> <p>Minor activities on track, turnouts and corridor assets. Includes minor ballast cleaning, a corrective maintenance activity to replace the fouled ballast and mud holes from beneath the sleepers for a length of track up to approximately equal or less than 40 sleeper bays (as a guide).</p>	<p>Identification of faults not visible via person inspections allows for fault rectification in a controlled manner prior to the fault resulting in a failure.</p> <p>Undercutting Minor Activities Spot repair mudholes and small areas of ballast fouling which cause track defects and increase the risk of derailment and remove TSRs.</p>	<p>Dependent on defect severity and time to remedy.</p>	<p>Tasks planned in accordance to Network Maintenance Block rules, predominately on nominated maintenance days or in shadow of renewal works.</p>
Structures and Facilities Maintenance	<p>Periodic inspection of bridge and culvert structures to monitor asset condition and performance.</p>	<p>Trend of condition allows for component or renewal works to be forward programmed given the wear rate of the assets</p> <p>Faults managed to mitigate against infrastructure failure leading to unplanned outages.</p>	<p>Inspection frequency takes into consideration the structure condition, structural capacity, deterioration rates, age, rail traffic operating conditions and other environmental or local conditions.</p>	<p>Tasks are planned in closures or in accordance to Network Maintenance Block rules, predominately on nominated maintenance days or in shadow of renewal works.</p>

Activity	Description	Benefits and Risks Managed	Trigger for Intervention	Access Management
Signalling and Telecommunication Maintenance	Inspection and maintenance that is regularly performed on the signalling asset to lessen the likelihood of it failing. Performed whilst the asset is in place and working so that it does not break down unexpectedly.	Faults managed to mitigate against infrastructure failure leading to unplanned outages.	Time based – planned periodic inspection and repair activities. Planned rectification works on identified faults to return equipment to working condition.	Tasks are planned in closures or in accordance to Network Maintenance Block rules. Predominately on nominated maintenance days or in shadow of existing renewal works.
Trackside Systems Maintenance	Inspection and maintenance that is regularly performed on the wayside equipment assets to lessen the likelihood of it failing. Performed whilst the asset is in place and working so that it does not break down unexpectedly.	Faults managed to mitigate against infrastructure failure leading to unplanned outages.	Time based – planned periodic inspection, servicing and repair activities. Planned rectification works on identified faults to return equipment to working condition.	Where these tasks have an impact to train running, these tasks are planned in closures or in accordance to Network Maintenance Block rules. Predominately on nominated maintenance days or in shadow of existing renewal works.
Electrical Overhead Substation Maintenance	Inspection and maintenance that is regularly performed on the electrical substation and overhead line assets to lessen the likelihood of failure. Performed whilst the asset is in place and working so that it does not fail unexpectedly.	Defects managed to mitigate against infrastructure failure leading to unplanned outages.	Time based – planned periodic inspection and repair activities. Planned rectification works on identified defects to return equipment to working condition.	Tasks planned in accordance to Network Maintenance Block rules, predominately on nominated maintenance days or in shadow of renewal works.
Other General Maintenance	Asset Management and Inventory Management	Inventory is held and managed at specific location across the network so as materials required for recitation works are available.	Critical spares determined by lead time to obtain parts, level of supplier support and availability of materials / component.	Tasks planned in accordance to Network Maintenance Block rules, predominately on nominated maintenance days or in shadow of renewal works.

Renewal Activities

Table 94 Description of CQC Renewal Activities

Activity	Description	Benefits and Risks Managed	Trigger for Interventions
Ballast	<p>Over time ballast becomes fouled through, coal dust general degradation, and sub soil contamination.</p> <p>Ballast fouling is managed via the following approaches dependant on the location of the fouling:</p> <p>BCM - excavating the fouled ballast from beneath the sleepers by a dedicated ballast cleaning consist,</p> <p>Ballast replacement as part of a formation repair or track upgrade – ballast is replaced as part of the formation repair activity and only where required as part of a track upgrade activity.</p> <p>Ballast undercutting turnouts - excavating the fouled ballast and mud holes from beneath a turnout by minor mechanised equipment such as an excavator</p> <p>Bridge ballast rollout – due to the width, height and environmental constraints on bridges fouled ballast on bridges is completely removed and new ballast added.</p>	<p>Ballast cleaning removes these contaminants from the ballast and restores the drainage and load management properties of the ballast moving water away from the formation and spreading loads across the track structure to reduce the risk of track geometry defects and formation failures.</p>	<p>Ground Penetrating Radar (GPR) provides a measure of ballast fouling severity comparative to prior GPR runs. This provides a non-destructive level of fouling.</p> <p>Scope is determined based on the number and frequency of resurfacing activities (a lag indicator of deteriorating track geometry), track geometry and GPR which is then reviewed and validated by Track Inspectors and Supervisors. The most fouled locations or those showing the greatest degradation are matched to the production of the Undercutting fleet and track access constraints.</p> <p>Network utilises a ballast condition analyser model to assist in identifying future years renewal requirements based on ballast and geometry condition to determine renewal intervention.</p>
Rail Renewal	<p>Replacement of rail in a section of track due to rail fatigue (increased defect rates) and/or wear approaching wear limits. Rail Renewal includes rail stressing to restore continuously welded rails to a design stress state, reducing risk of rail misalignment (buckles) and rail breaks.</p>	<p>Renewing rail in a planned way reduces rail breaks and rail faults that would otherwise lead to unplanned delays</p> <p>Reduces derailment risk related to rail break or rail misalignments.</p>	<p>The timing of renewal is dependent on the weight of the rail, its location in track (loaded / unloaded, on straights or curves) and rail compassion (head hardened, standard carbon on through hardened)</p> <p>Network utilises a rail condition analyser model to identify future years renewal requirements based on rail wear against standard to determine the required renewal intervention</p> <p>The Rail Renewal Strategy includes scope focused on smoothing the anticipated bow wave of tangent rail renewals through renewing tangent rails that have fatigue related issues, such as squats and shelling. Where appropriate, rail which has been</p>

Activity	Description	Benefits and Risks Managed	Trigger for Interventions
Turnouts and Component Renewal	Turnouts (sometimes called Switches) allow trains to move between tracks in duplicated sections, as well to allow entry and exit from passing loops and to move from the main line into spurs and balloon loops. A turnout is a combination of civil assets being the steel rail and sleepers and Control Systems Assets being the points motors, rodding and electronics.	Component renewal extends the life of the turnout. Full renewal and maintain operability of turnout providing operational flexibility.	subjected to significant cyclic loading is renewed with sleepers to gain efficiencies in renewal. Renewal - Condition and location of assets and degradation rate. Component – items within the turnout that require renewals based on asset component condition.
Sleeper Renewal	Sleepers (or ties), along with sleeper clips, hold the rails to gauge and alignment. There is a variety of sleeper types across the CQCN with most being 28 tal concrete for 60kg/m rail. Other sleepers are older styles with different rail fastening (clips). In sidings and older track sections there are both timber and steel sleepers.	Reduction in track alignment issues relating to gauge and rail twist leading to temporary speed restrictions or unplanned delays. Reduces derailment risk cause by loss of gauge or rail twist.	Sleepers are condition rated based on weight, material and condition. The sleeper renewal program is renewing aged underweight sleepers with the 28 tal concrete standard.
Structures Renewal	Structures are bridges and culverts that allow for the flow of water through the rail formation or for access under the track. Bridges are located at large hydrological water flows (rivers, creeks etc) Culverts are located at low points allowing overland flows through the track infrastructure.	Renewal of assets prior to failure to reduce unplanned delays or safety risks associated with structure failures Strategy to review hydrology in renewal locations to reduce number of culverts.	Structures are inspected and assigned a condition rating and allotted a location criticality. Structures are then ranked based on condition and operational criticality rating.
Civil Asset Renewals	Civil assets are those assets that support the Permanent Way assets and include formation, level crossings, access roads, access points and corridor security.	Formation renewals reduces formation failures, track geometry issues and requirements for track resurfacing. Renewals of level crossings, access roads and corridor security ensure continuity of safe operations.	Civil assets are inspected and assigned a condition rating and allotted a location criticality.
Control Systems Renewal	Control Systems assets are the physical and digital assets that provide, train control, telecommunications and wayside monitoring systems. These assets provide the capacity multiplier for the track assets, that	Train control renewals ensure the continuity of the train control systems and provides	The trigger for the renewal of Control Systems assets is predominantly driven by the age of the asset along its life cycle.

Activity	Description	Benefits and Risks Managed	Trigger for Interventions
	<p>is they allow for the safe movement of more train services over the track structure. The main classes within the Control Systems grouping are:</p> <p>Train control Systems: signalling system, level crossing active protection, interlockings and point motors</p> <p>Telecommunications: the data network required to connect assets to train control, includes the optic fibre network, digital radio and microwave radio systems</p> <p>Wayside Systems: assets in the rail corridor that provide a level of monitoring and alarming to protect track and overhead assets.</p>	<p>incremental improvement to the operability of the system</p> <p>Telecommunications renewals reduce telecommunication interruptions and ensure the integrity of the safe working systems and track side equipment</p> <p>Wayside systems renewals ensure integrity for the real time monitoring across the network to identify out of tolerance or non-controlled rollingstock interface issues.</p>	<p>These assets do not necessarily wear with tonnage, and often don't show degradation until the point of failure</p> <p>Obsolescence of data systems or components is also a key trigger for asset renewal.</p>
Electrical Renewals	<p>Blackwater and Goonyella Systems are electrified, enabling the operation of electric rollingstock. The traction system comprises two main asset groups:</p> <ul style="list-style-type: none"> Overhead Line Equipment (OHLE) - infrastructure which enables distribution of traction power to trains on the network. This infrastructure includes mast and portal structures, overhead wires and sectioning equipment. Traction Power Systems – The traction power system connects to the high voltage transmission network (Powerlink or Ergon) and converts the transmission voltage down to 50kV for the traction system. The power systems assets include substations, switchgear, transformers, protection and control and metering equipment. 	<p>Renewals across the 2100km of OHLE mitigates the risk of OHL mechanical component failures (e.g. dewirements) to ensure the safe and reliable operation of the traction network.</p> <p>Renewal of traction power system assets mitigates the risk of unplanned outages of the traction power supply and safety risks associated with power systems assets to ensure safe and reliable operation of the traction system.</p>	<p>Both OHLE and traction power system renewals are triggered based on asset condition and criticality. The renewal of power systems equipment is predominantly driven by the age of the asset. OHLE renewals are typically driven by age, environmental factors and tonnage.</p>

Appendix 6 – Works End to End Process

In the identification, prioritisation, planning and execution of works, Aurizon Network applies a Works End to End (E2E) process. The E2E provides a structure for the works to be managed within a timeframe that leads to MRSB delivery. The E2E process is similarly used for capacity growth projects, third party works such as connections or system augmentations and wayleave work.

The E2E is separated into 5 elements as described in Figure 65. This section provides detail on each of the elements and how they interface.

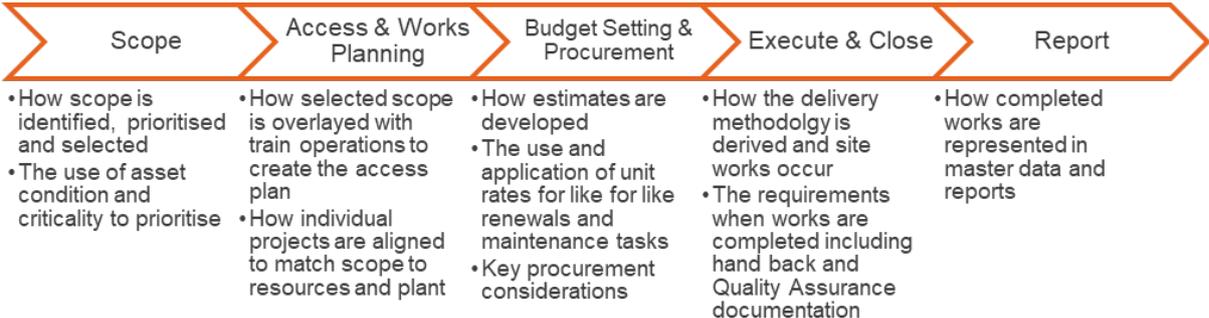


Figure 65 Works End to End Process

Scope

Aurizon Network’s asset management lifecycle strategy is focused on:

- inspecting and maintaining assets to prolong the useful life; and
- monitoring assets to identify the commencement of condition deterioration (signified by increases in planned corrective and reactive maintenance), at which point, renewal is planned as the asset approaches end of service life.

Effective asset management requires an understanding of the life cycle model, failure mechanism and design life of the asset. Aurizon Network’s assets can broadly be categorised into two asset life cycle models:

- Type 1 - Assets that gradually wear through use, e.g., rail, sleepers, contact wire and turnouts
- Type 2 - Assets which operate until a point where there is a marked increase in asset failures, e.g., electrical interlockings.

Aurizon Network monitors the asset condition through preventive maintenance inspections and analysis of historical failure trends, to determine the requirements for planned corrective scope and the timing of renewal intervention to ensure the supply chain objectives are met.

This section outlines the activities undertaken to:

- identify asset renewal scope
- identify maintenance scope; and

- improve scope identification.

Asset Renewal Scope Identification

The scope of renewal activity in each Coal System is identified and prioritised through a process which considers supply chain requirements, asset condition, strategic principles, relevant standards, design processes, resource and access planning, detailed execution planning and delivery optimisation, the key steps are outlined in Figure 66.



Figure 66 Asset Renewal Scope Identification Process

Asset Condition

The identification process commences three years prior to the execution of the relevant MRSB, using the relevant combinations of data available based on inspections and maintenance and renewal history. For example, in this financial year (FY27) preliminary scope for FY29 will be identified, prioritised and confirmed for refinement.

Profile Smoothing

In the development of the strategies for each asset class, Aurizon Network has identified the extent to which the renewal profile, based on the age of the asset, will result in significant peaks in renewal activity over limited timeframes, that is a ‘bow wave’ of renewals. Where large scale renewal is forecast to be required in a limited number of years, Aurizon Network applies a strategic smoothing of these renewals to better manage the risk of failure as the asset approaches end of life and the significant access and resources that would be required. Examples of smoothed asset products include rail and autotransformers.

Scope Categorisation

To assist in comparing levels of scope year on year, identified scope is categorised in accordance with the relevant asset strategy for that asset product. Four scope categories have been defined in Table 95.

Table 95 Definition of Scope Categories

Scope Category	Description	Examples	RIG Considerations
Baseload	Renewal scope that is typically repeatable year-on-year and consistent with scope endorsed in previous financial years.	Rerail Track Renewal Structures Ballas Cleaning UTC Upgrades Power Systems	This is scope that is generally repeated year on year following standard processes for scope identification.
Future Scope	Scope relating to preparation works for renewal activities that will be completed in future years. This includes design works and	Turnout Design Structures Design Power Systems Design Interlocking Design Level Crossing Design	This is design effort required to get to issued for construction design for works that will be completed in a future year.

Scope Category	Description	Examples	RIG Considerations
	procurement of long lead items.		
Strategic Scope	<p>Project scope that is not Baseload Scope and relating to renewal of a particular asset class due to age, condition or a change in safety requirements.</p> <p>The “strategic” description refers to the decisions made with regards to timing of scope delivery (single year or multi-year program) or the methodology of delivery.</p>	<p>Short Span Bridge Renewal</p> <p>Autotransformer Renewals</p> <p>Traction Substation Renewal</p>	Aurizon Network will consult with the RIG for Strategic Scope Programs of material value.
Reactive Renewals	An allocation made to renew assets that experience accelerated condition degradation against the expected condition change. Also utilised to rectify assets that fail in operation. The scope of reactive renewals is typically unknown or undefined at the time of MRSB development.	<p>Formation Reactive Works</p> <p>Turnout Reactive Works</p> <p>Level Crossing Reactive Works</p> <p>Fencing and Access Roads</p>	The railway is a dynamic environment where asset condition degradation can change. An allocation for addressing assets that have accelerated degradation is used to create a realistic estimate of costs.

Combined Risk Assessment (CRA)

To determine the priority of each asset renewal, the Combined Risk Assessment (CRA) framework is utilised.

The CRA methodology provides guidance for prioritising asset renewals scope for assessing condition-based risk, used for Civil, Electrical and Control System renewal scope, it specifies the parameters, values, and conditions to be used.

The reporting framework for CRA comprises three components:

- The **Condition** Index is a continuous scale between 1 and 5, which is an evaluation of the Probability of Failure (PoF). This is described as the likelihood of condition-based failure per annum for individual assets. See Table 96 for condition ratings.
- The **Criticality** Index is a combination of the Location Criticality and the likely Performance Impact and is a continuous scale between 0.5 and 5 which is an evaluation of the Consequence of Failure (CoF). See Table 97 for the performance impact score. Location criticality differs across each system and each track section within a system. As such, each track section is assigned a location criticality ranking.
- The CRA Index, in a continuous scale of 0.5 – 25, represents the overall risk of condition-based failure. The risk of condition-based failure associated with an individual asset is the product of PoF and the Criticality Index.
- **CRA Index**

- The CRA Index is calculated as the product of the future condition index and the criticality index.
- CRA Index= Future Condition Score X Criticality Index.
- CRA Index scores are plotted on a 5x5 matrix and can range from 1 to 25.

New assets and strategic renewals will be set with a CRA score of 100 so that they are easily distinguished from scope that does not include a modifier.

The Reactive Renewals allocations is assigned a CRA score of 25.

Table 96 Condition Rating Descriptions

Condition State	Subjective Rating	Description of Rating
1	GOOD ("as new")	Free of defects with little or no deterioration evident.
2	FAIR (Preventive Maintenance)	Free of defects affecting performance, integrity and durability. Deterioration of a minor nature that is monitored via preventive maintenance activities.
3	POOR (Corrective Maintenance)	Defects that are beginning to affect the durability/serviceability, which may require monitoring and/or remedial action. Some components or elements show quantitative signs of advancing deterioration. Corrective Maintenance activities are normally required. There is an increased probability of asset failure due to condition.
4	VERY POOR (Action Required)	Significant defects affecting the performance and structural integrity of the asset are present. Such defects require immediate intervention including inspection or operational restrictions. Asset shows advanced deterioration and/or evidence that it is acting differently to its intended design mode or function. Very high likelihood of a failure of the assets primary function.
5	FAILED (Immediate Action Required)	The asset has failed or has impending failure to one or more primary functions. Asset integrity is severely compromised. The asset has reached the end of its useful life.

Table 97 Performance Impact Score for the Criticality Index

Performance Impact Score	Performance Impact (MDT)
0.5	No Downtime
1	< 12 hours
2	1 day
3	3 days
4	7 days
5	> 14 days

Note: Performance impact for each individual asset type is separately determined and uses Mean Down Time (MDT) to provide a 0.5 to 5 score for the Performance Impact Score, based on the number of historical incidences and how long the system is shut to train services.

Maintenance Scope Identification

Aurizon Network’s approach to maintenance uses qualitative and quantitative data to minimise unplanned response or intervention, and therefore, mitigate impacts on Committed Capacity. The key steps are outlined in Figure 67.

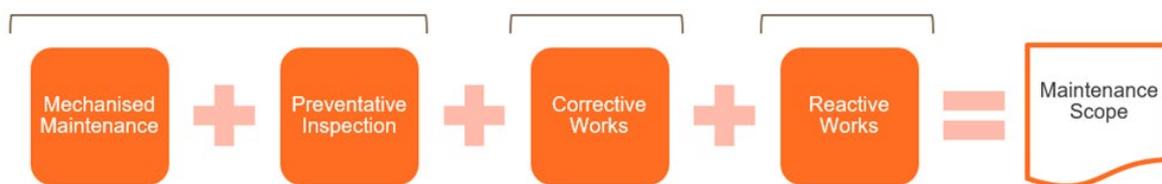


Figure 67 Maintenance Scope Identification Process

Preventive maintenance is conducted at the intervention levels specified in Maintenance Product Tables within Aurizon Network’s AMRP, which are based on intervals of time, condition and usage. Appendix 3 – Alternate Considerations for Maintenance provides further information on the triggers for intervention for maintenance activity. Due to their predictive nature, Aurizon Network seeks, wherever possible, to align the delivery of preventive maintenance activities with adjacent supply chain outages.

Preventive maintenance generally has a less intrusive impact on the supply chain, due to its planned and coordinated nature. Planned maintenance activities are packaged to maximise the amount of scope completed during planned closures in each location, which in turn can create access, delivery and cost efficiencies.

Not all activities can be planned. The forces exerted through the passage of rollingstock, and Queensland’s weather will, on occasion, create the need for unplanned interventions, which include reactive maintenance or planned corrective maintenance. Depending on rectification timeframes, reactive and planned corrective maintenance may be able to be scheduled in between train services to minimise impact to train operations.

Aurizon Network prioritises reactive and planned corrective maintenance activities based on impact to immediate operations, taking into consideration tonnage, traffic purpose and longer-term capacity impact, which informs the rectification timeframe options as outlined in Figure 68.

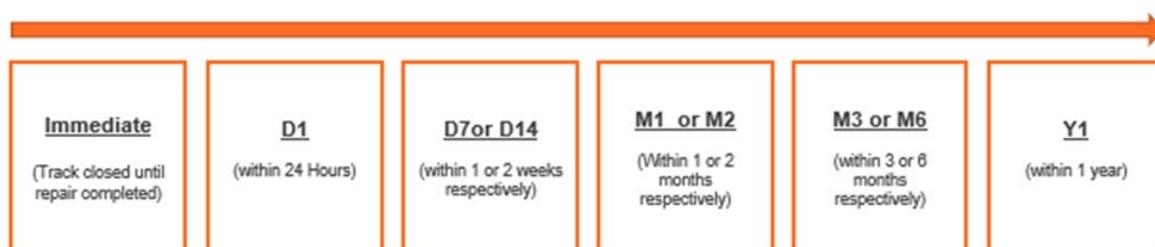


Figure 68 Timeframes Associated with Corrective Maintenance Activities

Table 98 outlines Aurizon Network’s maintenance approach across each asset type.

Table 98 Maintenance Approach

Maintenance Approach	Description	Applied to Assets	Maintenance Activity
Condition or Tonnage Based Intervention	Maintenance programmed to occur once a usage threshold is met.	Rail, turnouts and ballast	Rail grinding – of both track and turnouts to return the rail profile to design and remove any minor faults.

Maintenance Approach	Description	Applied to Assets	Maintenance Activity
	Maintenance can be programmed ahead of time due to forecast traffic movements.		Resurfacing – of both track and turnouts to maintain track to the design geometry and ensure track alignment.
Planned Inspection and Service (Preventive Maintenance)	<p>Periodic inspection of assets to understand condition and identify items that may cause a future fault.</p> <p>Period of inspection is known and can be planned.</p>	Rail, sleepers, turnouts, ballast, formation, culverts and bridges	<p>Track geometry recording – ATIS, to measure geometric characteristics of track alignment.</p> <p>Ultrasonic rail testing – non-destructive testing to identify internal rail defects.</p> <p>On track inspection – road rail vehicle inspection of the rail corridor.</p> <p>Structures inspection – inspection of critical elements of the structures to categorise defect type and quantify severity – ultimately providing an overall condition rating.</p> <p>Ground Penetrating Radar – specialised non-destructive testing employed to help understand and quantify ballast fouling severity. This data complements other contributory datasets (e.g., track geometry) to develop and determine ballast cleaning scope more accurately.</p>
		Signals, interlockings, level crossing protection, optic fibre, standby power system, SCADA system, radio system.	Control Systems Inspection - planned periodic inspection and minor servicing. Includes function testing, signal alignment testing, battery testing, cleaning and security check.
		Power systems and overhead line equipment.	Electrical Inspection - planned periodic inspections and minor servicing. Includes condition testing, oil sampling and isolator testing.
Planned Corrective Maintenance	<p>Planned rectification of faults found from inspections or remote monitoring.</p> <p>PeriTime to rectify is dependent on the severity of the fault or risk to operations.</p>	Rail, sleepers, turnouts, ballast, formation, culverts and bridges	<p>Rail joint maintenance – rail welding, rail plating and lifting and lining rail joints, squat removal.</p> <p>Maintenance Ballast – small section ballast repair / replacement, removal of mud holes.</p> <p>Sleeper cluster management – spot insertion of sleepers to</p>

Maintenance Approach	Description	Applied to Assets	Maintenance Activity
			<p>repair damaged sleepers, sleeper testing, fastening repairs and sleeper respacing.</p> <p>Rail stress adjustment – rail stress testing and adjustment to manage compression and expansion of the rail.</p> <p>Top and line resurfacing – hand track tamping and small machinery tamping.</p> <p>Structures repairs – minor concreting works, kerb repair, walkway repair, bridge drain cleaning.</p> <p>General earthworks maintenance – embankments and cutting repair, drain cleaning and access road maintenance.</p> <p>Drainage Improvements – large-scale reinstatement program to manage water accumulation adjacent to track.</p>
		Signals, interlockings, level crossing protection, optic fibre, standby power system, SCADA system, radio system.	Control Systems - maintenance and component repair.
		Power systems, overhead line equipment.	Electrical - general maintenance and component repair.
Reactive Maintenance	Immediate remedy of faults that have disrupted operation of the rail network.	Rail, sleepers, turnouts, ballast, formation, culverts and bridges.	<p>Rail repairs – immediate repair of broken rails, failed welds or internal defects.</p> <p>Mud hole removal – saturated fouled ballast sections dug out and repaired to maintain track alignment.</p>

Access and Works Planning

Once the scope has been identified and prioritised for Maintenance and Renewals, access and works planning is undertaken. In this phase of the E2E process, asset activities are subject to a progressively detailed review to align all the required scope and develop high level possession, resourcing and work execution plans. The process considers the requirements of customers and other Supply Chain Participants.

The process is iterative and may result in scope shifting between closures in the year or between financial years, driven primarily by the assessment of likelihood of change or delivery risk based on information known at the time.

This section outlines the key elements of access and works planning as depicted in Figure 69 and includes improvements captured in the development of the FY26 MRSB.

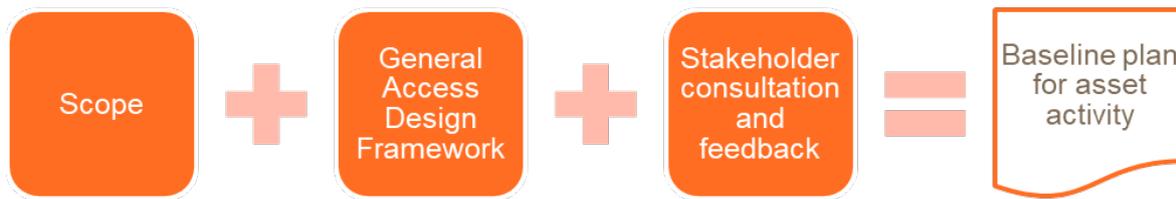


Figure 69 Overview of Access Planning Process

Access Design Framework

The Access Design Framework outlines key considerations when seeking to minimise the impact of asset activity on Committed Capacity. This involves engaging and consulting with stakeholders to deliver an access plan that aligns maintenance and renewal activities as closely as possible with customer and supply chain stakeholder plans.

Possession planning is typically undertaken based on the scope identified and the resulting level of customer impact. Aurizon Network assesses each element of scope and attempts to deliver it in such a way as to minimise the overall impact to all customers.

Key assumptions of the design framework are outlined in Table 99.

Table 99 Assumptions of the Access Design Framework

Description	Realised Benefits
Try to avoid June and December, and public holidays	Customers require these months to be kept free from major maintenance activities to allow for maximum railings for end of financial year and end of calendar year targets. Employee and contractor availability is reduced and more expensive on public holidays.
Strategic closure sequencing	Allowing adequate timing between corridor integrated closures, offsetting with other closures and alignment with the Queensland Rail network (NCL) closures provides for railing opportunities and gives people and plant time to move between corridors.
Alignment of major supply chain interfacing infrastructure outages (Port unloading closures, Train Loadout closures), with high impact Network activity and/or locations	Active engagement with customers and unloading facilities on their interfacing infrastructure maintenance outage plans to look for opportunities to coordinate Network maintenance activities, reducing customer impacts and maximising throughput for the supply chain.
Export terminals with overlapping major unloading/dump station	Early engagement with ports allows Aurizon Network to facilitate collaborative sessions to understand their requirements, align closures and identify opportunities to minimise supply chain disruption where possible.
Separation of major works across weeks/months	Separating works over the period allows the supply chain opportunity to recover in a stable way across the year, assists in delivery of monthly contractual obligations and the management of internal and external resources.
High impact Ballast Undercutting planned inside Integrated Closures where possible	Given the access required to deliver ballast undercutting, access planning targets high impact locations to be executed in integrated closures, with residual scope targeted for delivery in alignment with major supply chain outages where possible.

Description	Realised Benefits
Planning and levelling of work to best manage scope delivery risk	Consideration is given to the periods of known low resource availability, rosters and periods of high weather risk to the delivery of the program.
Consideration of critical support staff	With detailed consideration of critical support required including protection officers and electrical staff, works have been planned to ensure they are executable, having the resources required to deliver.
Resurfacing Plant Shutdown adjustments	Adjustments are made to resurfacing plant shutdowns to maximise plant availability inside Integrated Closures.
Maintaining availability for cross system producers	During Integrated Closures where there are cross-system customers, access planning looks to maintain an opportunity for railings and where possible, minimal disruption in the opposing corridor.

Works Planning Considerations

During the development of the Access Plan, high level factors impacting the planning of work that drive the duration of access are considered, including preparation, mobilisation, works duration, demobilisation and delivery risk.

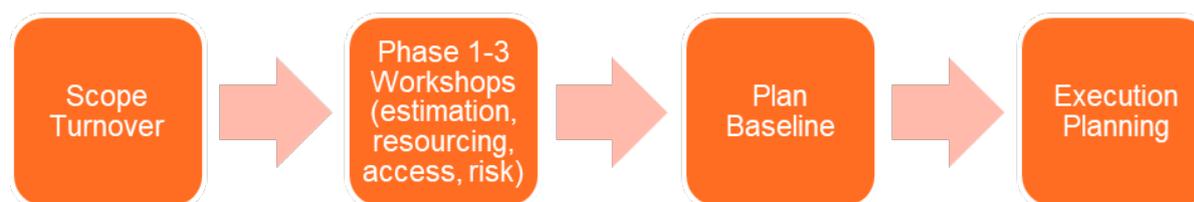


Figure 70 Overview of Works Planning

In developing the plan, Aurizon Network reviews each major renewal activity and the asset works program as a whole. The matters considered are listed in Table 100. Further detail on execution of works and possession types is included in Works Execution and Close in Appendix 6 – Works End to End Process.

Table 100 Works Planning Considerations

Matter for Consideration	Description
Can work be packaged together (integrated)?	For example, ballast cleaning, rerail and overhead work all occurring within the same vicinity would be undertaken as one block of work utilising the same possession, track protection and electrical isolation.
Can the work be undertaken during an integrated possession?	Generally, work activities are planned during integrated possessions to the limit of available resources (people, machines and equipment and/or available contractors) and reducing the impact to customers by minimising the footprints where possible.
Can the work be undertaken on a single line allowing trains to run on the adjacent track?	If the worksite is on duplicated track, a single line closure can be taken which would allow trains services to continue to operate on the adjacent track.
Does the work need to be undertaken during daylight or under specific weather conditions?	For example, welding is influenced by track temperatures so is planned to occur early morning or early evening, particularly in the warmer months. Other activities are also limited to daylight hours for either safety or visibility reasons (for example, the use of the Track Laying Machine).

Matter for Consideration	Description
Does the activity require specialised skills not within the Aurizon Network workforce?	External contractors may be engaged to supplement the Aurizon Network workforce where there are capacity constraints, equipment constraints or specific skills required. For example, the bridge bearing replacement program will be delivered by specialist bridge contractors that have the specific skills and equipment required to undertake the tasks.
Does the activity require long lead-time items?	Some inventory has greater than 6-month lead time for delivery. Activities that have inventory risk, start prior to the MRSB being approved. This increases the risk of having stranded inventory if projects are not approved or are delayed into future years.
Are we maintaining a consistent roster pattern?	Operational teams have communicated the need for a consistent roster pattern. During the planning phase, the closure regime and single line activities were planned into a consistent roster pattern.
Are seasonal conditions considered?	Larger closures are generally planned in the dryer / cooler months.
Is the work activity fixed, flexible or can be undertaken between trains in the day of operations?	All work activities are categorised into one of three categories with appropriate planning horizons applied. <ul style="list-style-type: none"> Fixed: work activities that require large teams, involve major plant and equipment or require pre-delivered materials. This work is deemed fixed and is planned up to 12 months in advance. Flexible: work activities that are flexible and could occur on different days of the week (with some notice). These activities are moved to minimise impact to train services. Between trains or 'plan through': work activities that are short in duration (e.g., inspections), don't involve breaking the track and could occur between trains in the day of operations.

Customer Consultation and Feedback

Aurizon Network's decision making during the access planning process is informed by feedback received from customers through planned and/or informal engagements.

The publication of the "CQCN – Asset Activities" Power BI report provides transparency around the detail of the relevant years renewal plan and subsequently informs the Capability Train Plan. The CQCN – Asset Activities Power BI report is the output from the Access strategy and planning processes.

To facilitate customer engagement as the plan is being developed, Aurizon Network has developed a three-phase access planning process in Table 101. This represents the evolution and maturity of the access plan leading to the submission of the Final Draft Proposal each year.

Table 101 Key Elements of Access Planning Process

Maturity of Planning Lifecycle		Maturity of Plan	Action to Progress Plan
Aurizon Network shares first draft of possible closure requirements for consultation			
Phase 1	Project Location (First draft CQCN Integrated Closure Plan)	Output of the Scope Priority Model shows the type and location of work required. This is used to determine an indication of required time on track and the level of impact to customers.	Early engagement with QR and the Ports to work through any misalignment issues on integrated closures across the supply chain. Discussions with producers on demand projections over the year to determine high demand/low demand months.

Maturity of Planning Lifecycle	Maturity of Plan	Action to Progress Plan
		Output: Draft CQCN Integrated Closure Plan highlighting critical path scope and locations.
Customers provide feedback as part of consultation process on proposed CQCN Integrated Closure Plan		
Phase 2	Project Scope (Second draft CQCN Integrated Closure Plan)	Includes customer feedback from Phase 1 and what we need to consider as part of Phase 2. A high-level project scope design informed by engineers and site walkouts, provides a clearer picture of the scope requirement and site-specific issues.
		Incorporate customer feedback in development of plan and provide updates on relevant considerations or changes. Output: Draft CQCN Integrated Closure Plan highlighting changes from Phase 1 and Integrated Branch line Closures and Draft Power BI CQCN Asset Activities Report.
Customers provide feedback as part of consultation process on Customer specific issues		
Phase 3	Project Delivery (Maintenance Strategy and Budget, Renewals Strategy and Budget and CQCN Asset Activities Report)	A detailed design, delivery method and procurement methodology for some asset activities with maturity continuing to increase closer to execution. The customers have provided feedback on the access plan, to inform the Draft Proposal.
		Output: Draft Proposal and related Power BI CQCN Asset Activities Report (representing the CAAC).

Treatment of Uncertainty

Aurizon Network notes that the development of the MRSB is an iterative process. Rail infrastructure in each coal system is exposed to extreme forces from rolling stock, climatic extremes, and localised geological and hydrological conditions. It is expected that asset conditions will change over time, necessitating amendments to scope, cost, and access.

The timeline from scope identification through site walkouts, detailed estimating, work and access planning, MRSB submission and approval, and the start of the MRSB year can be up to 11 months. Additionally, the approved scope item may not be scheduled for completion until late in the MRSB year, during which asset conditions continue to change.

During the MRSB delivery year, there is also the opportunity for changes affecting total project cost, project scope, required access to complete works, or a combination of these factors. While some common factors can impact cost, scope, and time, the likelihood of change may vary for each category depending on the controls in place.

The estimated costs consider the relative degree of scope maturity and estimating process maturity, which collectively define estimate accuracy. Historically, a single point value has been communicated as the base estimate value. However, it is important to convey the uncertainty associated with that single point value to describe the true probabilistic nature of the estimate and the causes of the uncertainty.

The dollar values against scopes in the Draft Proposal are values before full consideration and quantification of uncertainty and risk through scope maturity and delivery. This base estimate is the targeted budget for the associated scope of works and should be considered as a forecast, with a range of possible cost outcomes driven by the realisation of project delivery risks or opportunities through the year of delivery. Aurizon has not assigned a contingency amount against the MRSB scope costs. Instead, it seeks to understand known risks to the program's delivery and has a variation management

process (detailed in the next section) to react to unknown risks affecting cost, scope, or access.

Unknown risks cannot reasonably be anticipated and are rarely provided for in a budget. They are not included in a contingency and are managed reactively if they materialise, though they are rare. Known risks, however, are understood and expected to some extent. They are quantified and communicated, but no contingency (also referred to as a risk provision) is assigned. As part of final planning and delivery, risks are actively mitigated to minimize change impacts. We estimate the known knowns, calculate the known unknowns via a Quantitative Risk Analysis, and react to the unknown unknowns (variations) if they materialise.

Causes of Change – MRSB Development

Through the MRSB development process, there are three key milestones to identify the likelihood of change for each scope item.

Table 102 Milestones in MRSB Development and Likelihood of Change Consideration

Milestone	Description	Change Influence
Scope Turn Over (31 March)	Scope identified by Asset Management team and provided to Works Planning and Access Planning to develop the draft integrated possession plan.	<ul style="list-style-type: none"> Extent to which detailed designs have been completed and the impact design work may have on the delivery method. Assumptions in developing design (i.e. draft design requirements change as design matures to Issue for Construction).
Site Walk Outs (March to May)	Inspections of renewal sites to confirm scope and application of design to construction.	<ul style="list-style-type: none"> Site conditions may present issues / opportunities against proposed design. Site access and adjoining land issues can create non-considered scope requirements (i.e. temporary access requirements or additional land requirements). Pre-digs and hydrology assessments for ballast and formation scope may identify latent ground conditions or water flow considerations not considered or different to assumed as part of the design phase. Identification of site opportunities to improve asset layout, access and drainage leading to additional scope addition to the asset that was originally identified for renewal due to condition. Availability of resources and/or plant of scopes and clashes given the peak load within integrated possessions.
Phase Workshops (May to August)	Evolution of the access plan and assignment of resources to scope.	

Milestone	Description	Change Influence
		<ul style="list-style-type: none"> Finalisation of detailed estimates against forecast estimates or historic costs.

Causes of Change – MRSB Delivery

Most of the change occurs in the year of delivery but the reasons for change are known, as they have typically been seen within the delivery of the renewal and maintenance works in prior years. As a result, Aurizon Network has controls in its processes to be adaptable to change.

Table 103 details these typical risks and the existing controls.

Table 103 MRSB – Typical Risks and Opportunities

Change Risk	Example/Notes	Controls
Weather impacting planned closures	A planned integrated closure lost or weather effecting some scopes planned in a closure.	<ul style="list-style-type: none"> Front loaded delivery for civil renewals to take advantage of dryer conditions. Multiple Integrated Possession presenting opportunity to recover lost works.
Plant breakdown	Mechanised plant breakdown required to complete works.	<ul style="list-style-type: none"> Prequalification of contractor plant includes required maintenance history and maintenance plans. Mechanised plant has planned maintenance and overhaul cycles and maintenance days.
Increased reactive scope	Above the allocations made for fix on fail scopes in system.	<ul style="list-style-type: none"> Determination of capital spend for both planned and reactive scope by product within system and deferral of planned site to accommodate reactive scope. Scope added to program and subject to post period review in the Capital submission for QCA review and approval.
Latent site conditions	Ground conditions or site hydrology different to design. Wet ground effecting access or heavy vehicle movements.	<ul style="list-style-type: none"> Asset and Delivery team complete a site walkout to understand site conditions. Pre digs and hydrology reviews completed as part of design process. Site access plans developed including traffic management plan and route planning for heavy machinery movements. Site access upgraded to facilitate increased construction traffic and provide weather proofing.
Cost variation to MRSB estimate	Assumptions made in estimate prove to be different. Estimate provided ahead of tender process for delivery.	<ul style="list-style-type: none"> Separation of design and procurement and delivery across years to allow tenders to be completed to inform estimate. Learning from similar activities in prior years assigned to future year work. Monthly program forecasting and reporting during delivery and variance reported via Quarterly RIG reporting.
Loss or change of approved track access	Access lost due to planning irregularity. Access changed to accommodate other critical works.	<ul style="list-style-type: none"> Phase works planning to determine required closure pattern for renewal works and planned maintenance activity.

Change Risk	Example/Notes	Controls
		<ul style="list-style-type: none"> Near term works planning processes to accommodate reactive maintenance along with planned renewals. Re planning of planned renewals into future closure opportunities if access or resource are required to complete other critical work.
Ability to complete planned scope	Planned scope not delivered due to time allocated not suitable, plant breakdown, weather impacts.	<ul style="list-style-type: none"> Actual scope completed recorded against planned scope in SAP. Missed or incomplete scope portions planned in SAP for completion in the current year or a future year based on Asset Manager assessment of criticality of incomplete scope.
New scope presenting into program	Unplanned degradation of an asset requires its renewal Scope has no assigned budget.	<ul style="list-style-type: none"> Options to accommodate additional scope are: <ul style="list-style-type: none"> Include and incur costs above budget to be assessed as part of annual capital claim process. Substitute an existing planned renewal for the new scope and defer the planned scope to a future year. Accommodate the new scope in the existing program if there have been savings against the planned program completed YTD.
Design change or error	Design assumptions not deliverable at site. Design did not consider adjacent infrastructure or site requirements.	<ul style="list-style-type: none"> Standard designs are used if applicable to reduce complexity of design. If bespoke design is required, then design is developed in stages and iterated in conjunction with the Construction team. Designer attend site walk outs to understand site specific considerations. Design Managers assigned to complex designs incorporating several asset disciplines to drive design integration and development.
Significant weather event effecting system	Cyclone flood event effecting planned program.	<ul style="list-style-type: none"> Undertaking contains Variation Event provisions. Works brought forward in the shadow of event, if possible, to complete works and hand back future access to offset the access impact of the event.
Re-allocation of resources	Change in the resources assigned to scope. Mix of internal and contractor delivery. Support resources not assigned to works.	<ul style="list-style-type: none"> Phase workshop planning and midterm planning processes plan both access and assignment of resources to required works. Resource planning includes assignment of support activities (electrical resources to complete isolation, Protection and Site Safety staff). Seek to use internal labour to minimise use of contractor staff.
Site access or constraint impacts	Baseload works using unit rate estimating being completed in complex site. Limited access, workspace (in cuttings or at height).	<ul style="list-style-type: none"> Scope site walkouts to adjust delivery plan or access requirement if site work location is constrained and adjust delivery methodology is required. Engage specialised contractors and or equipment if required. For example, embankment strengthening, tree lopping, not core activity so engage suitable contractors.

Variation Management

Change has a variety of impacts, these being:

- Change within a system not effecting MRSB commitments - Site based changes within program within system, changes to program schedule but that can be accommodated with in the delivery year.
- Change resulting in a departure from the System MRSB commitments- Scope increase / decrease, cost to complete above approved budget, additional access required to complete.
- Change that requires customer engagement.

Program change is managed through a structured Change Management process and approved under a tiered review system.

Table 104 outlines the agreed engagement for escalation to the RIG Representative Group in relation to variation.

Table 104 Variation Escalation as Agreed with RIG Representative Group

Item	Variations Description	Proposed Engagement	Role of RIG Producer Group
Cost	<p>Renewals – System wide cumulative variance of >15% is forecast, Aurizon Network will provide an overview at the next available Producer Meeting on rationale. Final costs subject to QCA review as part of capital claim approval process.</p> <p>Maintenance – Forecast to exceed materiality thresholders per the Undertaking.</p>	RIG Quarterly Forum RIG Producer Group	Inform (Quarterly Forum) RIG Producer Group Feedback and Support
Scope	New individual renewal sites, excluding those that are expected risk events (i.e. due to deteriorated asset condition or design maturity).	RIG Producer Group	Feedback and Support
Access	Additional or extended integrated closures greater than 12 hours.	RIG Producer Group and/or Customer Specific Consultation by Customer Account Managers (CAMs)	Feedback and Support
Other Year Scope	<p>Roll forward scope – completed under approved year's budget.</p> <p>Deferred scope – incomplete scope identified for execution in future years.</p>	Quarterly report summary and commentary. RIG Producer Group	Inform Feedback and Support (if triggers access materiality thresholds)
Other Variations	<ul style="list-style-type: none"> • Changes that do not trigger the materiality thresholds (Internal change governance). 	Quarterly report summary and commentary	Inform

Item	Variations Description	Proposed Engagement	Role of RIG Producer Group
	<ul style="list-style-type: none"> • Time critical or responding to an incident or safety issue. • Significant program variations resulting in a shortfall or forecast scope delivery. • Positive program changes where efficiencies are gained. 		

Risk Controls to Maintain Train Service Operability

Aurizon Network may implement operational controls as a means of managing the risk of asset failure in each Coal System. Aurizon Network applies these temporary measures as a means of allowing continued Train Service operability in the period between the fault being identified through to Asset Activity to rectify the fault. The five types of controls are outlined in Table 105.

Table 105 Operational Risk Controls Which May Allow Continued Train Operations

Control	Description
Inspection Frequency	Aurizon Network completes additional targeted maintenance inspections to monitor the rate of degradation of the defect. The intent of this approach is to ensure that the defect does not result in asset failure ahead of the planned date of intervention.
Engineering Inspections	Aurizon Network utilises internal engineering capability to perform inspections, modelling and testing to understand the root cause and rectifications for complex defects.
Temporary Restrictions (TSR)	<p>Speed</p> <p>Track defects that are identified via inspections will be assessed as requiring either immediate rectification or the assets can be managed via a TSR until their rectification can be scheduled within a planned outage.</p> <p>Train speed is lowered during the period from fault identification to planned corrective action. This in turn, will reduce the risk of derailment or incident and the impact of dynamic forces caused by the passage of rollingstock.</p> <p>TSR's are also applied to manage risk of incident resulting from the environmental effects of heat or wet weather.</p>
Alternative Authority	A manual process used to authorise train movement where a Control Systems asset has failed, and a normal movement authority (signal) cannot be provided. While this process cannot maintain the throughput of a fully functioning system due to additional procedures necessary to ensure safety, it does mitigate the impact of a failure. This is the signalling equivalent of a TSR.
Temporary Authorised Non-Conformance (TANC)	<p>A TANC is applied if an asset is operating outside its minimum operational requirements or function (often contemplated within a Standard). An engineering and safety risk assessment is undertaken to determine the appropriate controls required to safely manage these assets until the point that they can be rectified. Track speed may also be reduced, and the typical risk treatment is increased inspection to monitor asset performance.</p> <p>A TANC is only raised in exceptional circumstances for defects that cannot be actioned within the required timeframe. The TANC form is completed by the inspecting officer detailing the defect and control measures to mitigate the defect until repairs can be undertaken. The actions required for closure of the TANC</p>

Control	Description
	<p>are also detailed. The maintenance superintendent then ratifies the TANC to provide assurance that the details are correct and that the resources are available to implement the required controls for mitigation of the defect until rectified. Once completed, the qualified engineer will review the proposal and ensure that the controls are robust and do not import unnecessary risk to the operation. The TANC is then able to be approved by the asset manager.</p> <p>Not all TANC's will require a TSR to be imposed. An assessment will be made based on the nature and location of the defect. Where a TANC does require a TSR, the impact is incorporated within Aurizon Network's TSR reporting.</p> <p>The number and status of TANC's are monitored internally by Aurizon Network.</p>
Temporary Track Closure	<p>If a fault has been identified on a section of track, it may be isolated by temporarily removing that section from service, and operating train services on alternate tracks around the fault.</p> <p>This is achieved by putting a coded block in the train control system to remove the ability to route a train into the affected area.</p>

Budget Setting and Procurement

This section presents an overview of Aurizon Network's costing methodology for maintenance and renewal activities.

Aurizon Network confirms that the methodology for allocating costs between operating expenses and maintenance / renewal activities is consistent with the QCA-approved approach under UT5. Furthermore, Aurizon Network's below rail regulatory financial statements are subject to an annual review by an external auditor appointed by the QCA. The scope of this review includes any such cost allocations.

Budget Development of Maintenance Activities

Overview

Aurizon Network's approach to setting the draft maintenance budget varies according to the nature of the asset activity categories that are required to be presented under UT5. While some activities, such as mechanised activities and preventive maintenance activities, are predictable and have a clearly defined scope, other activities are corrective (e.g. fix-on-fail) in nature which results in Aurizon Network utilising historical expenditure levels to inform annual budget forecasts.

Aurizon Network ensures clear separation between the costs attributable to asset activities in each Coal System. Any costs associated with asset renewals, asset activities on Third Party Private Infrastructure, asset activities on Non-Coal Infrastructure and Review Events (such as extreme weather events where losses exceed \$1 million) are separately captured, which enables Aurizon Network to exclude such costs in their entirety when forecasting the maintenance budgets for each Coal System.

Different methodologies are applied to determine the costs relevant to the various maintenance items. The appropriate method varies according to the individual maintenance activity. Due to the more routine nature of the major mechanised maintenance activities, these activities are budgeted at a more granular level than non-mechanised activities. Preventive maintenance activities are informed by the asset maintenance plan.

Aurizon Network is continuing to pursue opportunities to enhance its systems, data and processes to provide greater transparency of cost drivers and improve budgeting and forecasting process for future years.

The primary drivers of Aurizon Network’s maintenance costs are discussed below. Additional information was provided in the FY27 Draft Maintenance Budget Presentation provided to the Rail Industry Group in October 2025.

Labour and Indirect Costs

Labour and indirect costs account for approximately half of Aurizon Network’s maintenance costs.

Aurizon Network’s maintenance and asset renewal program is executed primarily by Aurizon’s Network Operations and Network Asset Management divisions in conjunction with externally procured resources.

An overview of Aurizon Network’s operating structure together with the primary activities performed by each of the teams are summarised in Figure 71.

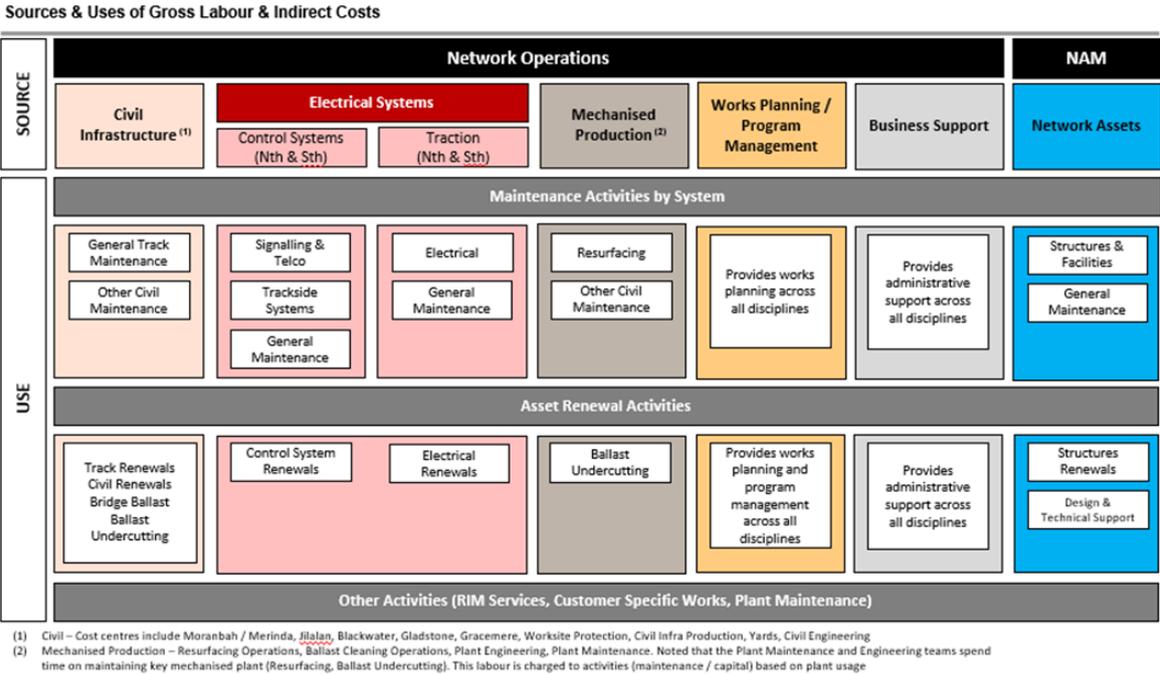


Figure 71 Aurizon Network Operating Structure

Aurizon Network’s internal maintenance labour costs are relatively fixed over the short term. Indirect costs refer to minor consumables, materials and depreciation incurred to facilitate staff in the delivery of maintenance and renewal activities within the depots (e.g. travel and accommodation, PPE, other minor depot costs). These costs represent ~15% of total labour and indirect costs.

The key drivers of Aurizon Network’s labour costs together with an overview of the FY27 Final Draft Budget approach are summarised in Table 106.

Table 106 Cost Drivers

Cost Drivers	Description	Budget Approach
Labour Costs		
Workforce Size	The number of FTE’s employed across Aurizon Network’s operating disciplines (Civil Infrastructure, Electrical Systems, Mechanised Production, Works Planning, Network Asset Management, Structures).	Workforce size is informed by a number of inputs including but not limited to; maintenance and renewal activity levels, depot size and location, qualification requirements, rostering requirements and on call support requirements. Forecast work requirements are developed based on the

Cost Drivers	Description	Budget Approach
		asset management strategy and on call response requirements.
Gross Labour and Indirect Cost Escalations	Increase in Labour and Oncosts to account for Enterprise Agreement rate increases. Aurizon Network.	For the Staff Enterprise Agreement, labour has been escalated at 3.5%. For the Infrastructure Enterprise agreement, labour has been escalated at 4.0%. Indirect costs escalated at 2.6% in line with RBA June 2027 CPI forecast at end of August 2025.
Activity Mix (Maintenance, Capital/Other)	Proportion of time (and therefore cost) allocated to RIG maintenance, non-contract maintenance, asset renewal and other activity. Activity mix varies by team and sub-function.	Activity mix is influenced by the forecast levels of activities and associated resource hours (maintenance/asset renewals/other) with variation mostly driven by changes in corrective maintenance or asset renewal requirements.
Coal System Mix	Proportion of maintenance hours allocated to each Coal System (Blackwater, Goonyella, Moura, Newlands).	Depots (or cost centre) costs generally flow to one or potentially two systems depending on location. The budget assumes that maintenance allocations by depot / team to each of the coal systems are broadly consistent with the mix seen in prior years.
RIG Category Mix	There are 9 RIG maintenance categories. (General Track, Other Civil Maintenance, Structures and Facilities Maintenance, Signalling and Telecommunications, Trackside Systems, Electrical, Track Resurfacing, Rail Grinding).	Activity by RIG category within each system is assumed to be broadly consistent with activity levels observed in prior years. Where there is a change in activity requirements, Aurizon Network will adjust forecast activity levels including between maintenance categories within a single Coal System or between Coal Systems, as required.
Non-Labour Costs		
Externally Procured Resources	Costs associated with external contractors, hire charges and trade services. Aurizon Network supplements its own labour and plant resources with externally procured contractors where specialist skills / equipment is required, or where a large volume of activity is delivered concurrently. Most of the contractor activity is used to support activity in the General Track, Other Civil and Structures and Facilities RIG maintenance categories.	Budgeted cost of known contracts including escalation rates (e.g. ultrasonic rail testing contract, rail grinding). Other contractor costs estimated having regard to historic spend and escalated at 3.4% informed by forecast WPI provided by Oxford Economics. ²
Materials and Plant Usage	The cost of materials (ballast, rail, sleepers etc) used in project operations either charged directly or consumed from inventories stores and pass-through costs for Aurizon Network owned major plant. All costs associated with major plant (e.g., operational and plant maintenance) are charged to jobs via a unit rate. The unit rate is used to allocate work between systems.	Machine charges are based on a detailed build-up of plant costs, escalated at 2.6% Other materials costs estimated having regard to historic spend and escalation at a weighted average of 3.7%, which has been estimated using 5-year Compounded Annual Growth Rate (CAGR) based on a combination of the following indices; 203 Cement, lime,

² Source: Oxford Economics Australia: Aurizon: Cost Escalation: Forecast to 2031/2032

Cost Drivers	Description	Budget Approach
	Under and overs in the year of execution are apportioned on a ratio of work completed.	plaster and concrete product manufacturing; 22 Fabricated metal product manufacturing; Domestic materials and Electrical Equipment (6427.0 Producer Price Indexes, Australia).
Consumables	The cost of computer hardware and software, technology costs, safety equipment, consultant fees, minor tools and plant, travel and accommodation, external freight and waste disposal.	Budgeted cost of known contracts (e.g. Freight Services contract). Other consumable costs are estimated having regard to historic spend and escalated at 2.6% with RBA June 2027 CPI forecast at end of August 2025.

Table 107 Maintenance Activity

Maintenance Activity	Description	Costing Methodology
Non-Mechanised Maintenance		
Preventative Maintenance		<p>Budget and forecasts for controllable or preventive maintenance expenditure categories have been set having regard to asset maintenance plans for each activity and the allocated resource costs associated to complete.</p> <p>Budgeted costs for the Targeted drainage program included within the General Track category, has been included for all recommended sites in FY27, informed by high level site estimates.</p>
Corrective Maintenance		<p>Corrective maintenance activities tend to vary year-on-year and are reactive in nature, predominantly due to inclement weather and degradation of asset condition. Consequently, Aurizon Network has estimated the costs for corrective maintenance activities with reference to historical corrective activities completed in FY23, FY24 and FY25.</p> <p>Any additional corrective maintenance activity requirements identified during the planning process are assessed in accordance with the Maintenance Scope Identification process as part of Aurizon's Works End to End process and have been adjusted for accordingly. Additionally, actual work completed in FY27 will also be assessed in accordance with the Maintenance Scope Identification.</p> <p>Corrective rail maintenance activity levels are expected to present to levels experienced in FY25, which has formed the basis of the FY27 activity level assumptions for this category. Costs have been escalated in line with the category commentary above.</p>
Mechanised Maintenance		

Maintenance Activity	Description	Costing Methodology
Rail Grinding	Budget for the forecast scope of works required in each Coal System reflective of the contractual arrangements with the external Service Provider.	<p>The Rail Grinding costs include the costs paid to an external third party for provision of rail grinding services as well as an allowance for the cost associated with the removal and re-installation of signalling and rail lubrication equipment from track before and after the rail grinding activity (predominantly labour and consumables). The budgeted cost of the rail grinding program in each Coal System is a function of the forecast mainline, turnout and level crossing grinding scope expected to be required in each Coal System. Pricing is in accordance with the Rail Grinding Services Agreement.</p> <p>Rail Grinding scope variation year on year is driven by anticipated grinding requirements and stable management of rail asset condition.</p>
Resurfacing	Forecast costs for the total resurfacing program with an allocation of cost between maintenance and capital activities.	<p>The resurfacing plant cost base is materially fixed year-on-year and is informed by the planned maintenance activity schedules.</p> <p>To set a budget for the FY27 resurfacing work program, Aurizon Network has:</p> <ul style="list-style-type: none"> estimated a forecast budget for operational labour and plant costs having regard to actual costs incurred in FY23, FY24 and FY25 and forecast / budget costs in FY26; apportioned the labour and plant cost forecast budget between maintenance (mainline resurfacing, turnout resurfacing and civil support by Coal System) and renewals activities based on the defined and agreed activities planned for FY26. <p>The cost of resurfacing support for renewal works are incorporated within the renewal program and are allocated to Coal Systems based on the location of planned scope for completion. Additionally, the resurfacing consist that primarily supports the ballast cleaning operation is included within the ballast cleaning program costs.</p>

Drivers of Change in Maintenance Budgeting Approach – General Track

Aurizon Network’s approach to setting the maintenance budget varies according to the nature of the asset activity categories within each system. The General Track maintenance category is largely corrective in nature. For most General Track maintenance activities, the corrective element of the budget has been based on historic corrective and reactive activity levels between FY23 and FY25.

For rail maintenance, targeted drainage and vegetation management, Aurizon Network has applied different assumptions informed by specific asset management strategies, operational execution methodologies and more recent levels of corrective maintenance activity. Further detail is provided below.

Rail Maintenance

During FY25, the General Track maintenance category saw an incremental uplift in rail maintenance activity levels, predominately driven by an increase in activities relating to rectification of Internal Rail Defects. Given the corrective and reactive nature of these activities, the FY27 Final Draft Budget has been based on the activity levels experienced in FY25. This is a change in approach for this category, with previous budgets and activity levels across other RIG categories generally informed by historical actuals in the preceding three-year period. As a result, additional costs have been included for internal Civil Infrastructure resource support, external contractor support and material costs to support the higher activity levels.

Targeted Drainage Program

Targeted drainage works have been included across all systems in FY27. The sites have been prioritised based on the site selection framework which includes asset condition, formation failure history and asset performance impacts. All 17 sites included in the FY27 Final Draft Budget have an asset condition rating of very poor and poor condition.

Vegetation Management

Vegetation management and maintenance activities are assumed to be delivered using a combination of internal labour and external contractors based on district specific strategies. A new vegetation management methodology, drone-deployed granular herbicide application was introduced in FY26 across all systems and is expected to continue into FY27. While this initiative has resulted in a short-term increase in contractor costs due to the concurrent use of traditional methods, it is expected to deliver long-term efficiencies through reduced vegetation management costs and improved operational reliability. The methodology will continue to be phased across the CQCN over the next 12 months, with outcomes monitored to validate cost-effectiveness and performance.

Budget Development for Renewal Activities

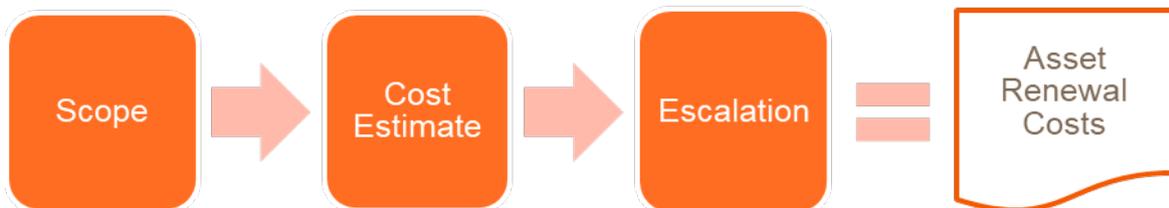


Figure 72 Renewal Budget Development Process

Costing Methodology for Renewal Activities

High Volume Asset Renewal Activity

Renewal activities such as track, rail and sleeper renewals are ongoing, annual programs of work that will generally see Aurizon Network undertaking a large volume of the same activity year-on-year.

These activities typically follow a standardised work methodology which includes:

- standard designs (that are adapted where necessary to account for site specific conditions); and
- a repeatable construction methodology at each work site.

Drivers of average cost variability in this asset category include, but are not limited to the following:

- scope quantity per site
- construction methodology – using plant such as the Track Laying Machine allows for a greater amount of scope to be completed within a shorter timeframe, however, will incur plant costs
- geographical factors – accessibility, space to store materials and manoeuvre plant and proximity to other track infrastructure (level crossings, culverts, turnouts, signalling equipment.
- ability to share resources such as signalling and electrical isolation support
- weather impacts; and
- available closure hours.

Aurizon Network developed cost estimates based on the historical level of activity required for each cost element. Adjustments have been made for known items that cause variability as described above. There will be cost variability between individual worksites that may influence the average cost per activity. Meteorological factors/conditions on the day of execution and in the days leading up to execution can further influence actual costs incurred.

Other Renewal Activity

Other renewal activities include Civil Assets (such as formation, structures and turnout renewals), Control Systems Assets and Electrical Assets. These activities generally have lower volumes of scope and require either a detailed, site-specific design, or the assembly of standard design elements appropriate for a specific site.

The budget for these asset renewal items is informed by the scope of work required to be delivered, guided by historical costs, site specific requirements and scheduling constraints. In addition to this, actual costs will also be a function of operational, geographical and meteorological factors and conditions.

Reactive Renewal Activity

Wet weather is the single biggest driver of reactive renewal work.

Aurizon Network will, from time to time, experience asset failure in some renewal categories such as formation, ballast undercutting and turnouts. The failure or imminent failure of these assets will be identified as part of routine asset inspections and will result in a reactive replacement of the asset.

Given the difficulties associated with accurately forecasting the occurrence of asset failure, Aurizon Network has made provision for 'reactive' works within the forecast budget for formation, ballast cleaning, turnout, level crossing, electrical overhead corridor asset renewals. These amounts are broadly based on historical average spend on reactive activities in each individual Coal System.

Mainline Ballast Cleaning

Mainline ballast cleaning is made up of three specific items being the Ballast Cleaning Machine (BCM), excavator undercutting and turnout undercutting.

Mainline ballast cleaning costs have been built up by BCM with total forecast costs allocated to systems based on forecast scope that is planned for completion each financial year. Key assumptions underpinning the cost build up are summarised below.

Budgeted costs for excavator undercutting and turnout undercutting have been informed by a combination of the contractor schedule of rates, where packaged works have been executed and historical costs for other support activities as required. It will also consider site specific operational requirements, including safeworking support, where required.

Mainline Ballast Cleaning Cost Build Up

Mainline ballast cleaning costs have been built up by BCM. Total forecast cost (excluding Ballast Undercutting plant depreciation) associated with the operation of the BCM have been allocated to each Coal System based on forecast scope that is planned for completion each financial year. Ballast undercutting plant depreciation has been allocated to systems based on the number of days that the BCM is planned for operation in each system.

Costs associated with the ballast cleaning operation are largely fixed costs, the majority of which are still incurred irrespective of scope that may be achieved and is subject to highly variable operating conditions.

Additional detail in relation to the make-up of costs has also been provided to the RIG Expert Advisor. Key assumptions underpinning the cost build up are summarised in Table 108.

Table 108 Mainline Ballast Cleaning Cost Assumptions

Items	Assumptions
Mainline Ballast Cleaning	<ul style="list-style-type: none"> • Scope for FY27 is 109.1km. • Machine Operation is the BCM RM902. • Freight includes: <ul style="list-style-type: none"> ○ 10 dedicated train crew and 5 locomotives ○ Costs reflective of current contracting arrangements. • FTE - The new BCM entered production in May 2021. The increase in workstations and increased componentry requires additional labour to maintain. At present there is also a requirement for the existing employees to be ticketed and trained in the BCM which is being filled by labour hire. Mechanised Production is reviewing the optimal structure for future operational and plant maintenance staff requirements. • Plant Depreciation – Ballas Undercutting plant deprecation has been allocated to systems based on the number of days that the BCM is planned for operation in each system. • Resurfacing Support – Utilise existing dedicated tamper and regulator. • Ballast - Cost estimates based on estimated ballast return rates utilising pre-dig (an excavated sample of track) screenability assessment and historical trends, returning track to the standard ballast profile, and the forecast average price per tonne. A change in conditions (wet or dry), material composition, variation in ballast depth and a change in material price may result in variability in ballast costs. • Production Rate - The production rate of the machine is the assumed rate of the cutting speed of the RM902 consist whilst in operation and can vary depending on site characteristics. FY27 average rate is 159 linear metres per hour. The machine production rate is different to the closure hour rate which can vary from 25m to 86m per closure hour. These rates vary greatly based what work is included in the closure (e.g., rail stress management may occur in the closure reducing closure production rate) and on-site specific characteristics. Site specific characteristics that create complexity include location for ballast stockpiles and spoil, whether there are multiple cut ins and cut outs and proximity to infrastructure such as level crossing, auto transformer sites, and the site access and additional land access requirements.

Items	Assumptions
	<ul style="list-style-type: none"> Ballast Return Rate - The ballast return rate is an assumed amount of ballast returned to track through the screening process. This return rate is based on a historical undercutting at these locations and a pre-dig assessment. The average across all FY27 sites is 32%. Where a 0% return rate has been nominated, this has been deemed unscreenable with all ballast to be replaced. Ballast Volume - The planned ballast being returned to track is at the standard track volume of 2.8m³ per linear metre, which equates to approximately 300mm depth below bottom of sleeper. This depth may vary between sites. The higher the volume required to be replaced, the lower the machine production rate.
Mainline Excavator Ballast Cleaning	<ul style="list-style-type: none"> Scope for FY27 is 10.3km. Machine Operation is the Excavator Undercutters (contractors). FTE – Excavator work will be completed by contractors with Aurizon staff providing support services. Resurfacing Support – Utilise existing tampers and regulators. Ballast – Cost of ballast and delivery of ballast isn't included in contractor packaging. Full ballast replacement occurs when undercut by excavators. High-impact ballast undercutting activities are prioritised during Integrated Closures; remaining work is done in single-line closures.
Turnout Excavator Ballast Cleaning Machine	<ul style="list-style-type: none"> Scope - FY27: 45 Turnouts (including undercutting of areas prior to, and after the turnouts to make a complete turnout undercut. In FY25, the adjacent area undercut would have been a C14 cost). Machine Operation is the Excavators Undercutters (contractors) FTE - Excavator work will be completed by contractors with Aurizon staff providing support services. Resurfacing Support - Utilise existing tampers and regulators (turnout specific tampers). Ballast - Cost of ballast and delivery of ballast isn't included in contractor packaging. Full ballast replacement occurs when undercut by excavators.

Procurement

Aurizon's Procurement Governance Management Framework outlines the systems, documentation, compliance mechanisms, and improvement processes that underpin procurement activities across the enterprise.

The Framework and systems are supported by a document suite of Standards, Procedures, Guidelines and Forms across all procurement process areas; sourcing, payments, contracts, and inventory. These documents detail our 'ways of working'. This suite is managed by the procurement systems and governance team, with regular reviews (annually or biennially) to ensure relevance and fit-for-purpose.

Key systems include SAP for master data, procureAURIZON for sourcing and contract management, Contract Suite for risk-mitigating templates, Informed 365 for human rights and modern slavery risk assessments, and EFTsure for fraud prevention and payment verification.

Compliance is managed through a risk-based Assurance Program, which includes risk-based sample testing, quality checks during sourcing and contract and inventory checks via annual stocktakes and external audits. This program is driven by a Key Controls Procedure; which defines internal controls for managing risk and monitoring mechanisms.

Key reporting metrics include:

- Category Management: Quality of Category Management Plans and Initiatives tracked via technology tool to ensure strategic alignment and visibility.
- Source to Award: Approval packs (Strategic Sourcing, RFx, Close and Contract) endorsed and uploaded in technology tool to confirm risk considerations, stakeholder engagement, compliance with Delegation of Authority (DOA) and governance framework.
- Contract Implementation: Checklists and Supplier Relationship Management (SRM) plans tracked to ensure effective execution and supplier engagement.
- Order to Pay: Controls include SAP-based workflows, segregation of duties (SOD), vendor verification via EFTsure, and regular purchase requisition/purchase order compliance monitoring and reporting.
- Inventory Management: 100% annual stocktake completion, inventory accuracy, obsolescence reviews, and PowerBI reporting on stock variation and write-offs.

Findings are reported to the Procurement Leadership Team, with actions tracked by the procurement systems and governance team. Continuous improvement is driven by team feedback, KPI monitoring, and audit outcomes, with initiatives prioritised by leadership for implementation.

The timing of procurement activities is determined by a number of factors, e.g. criticality/risk of the goods and services being procured, future business needs/demand, existing contract Term, market conditions and agreed procurement strategies.

Works Execution and Close

This section outlines Aurizon Network’s considerations to delivering and executing the asset activity required in each Coal System along with the supporting procurement.

Track Possession Types

Asset activity is executed using a variety of track possession approaches outlined in Table 109 which seek to minimise customer impacts and maximise safe access for people and plant.

Table 109 Summary of Track Possession Types

Type	Definition	Key Objectives	Example
Integrated Closures	When asset activity is required in high impact locations, requiring significant track time or results in significant capacity impacts. Track is typically non-operational to revenue services.	To combine asset activities into an integrated closure to enable maximum works to be completed as efficiently as possible. Where possible, this is in line with other supply chain outages (i.e., port closures).	Culvert Replacement Ballast Cleaning
Single line closures	When asset activity can be completed on one track in a duplicated section whilst the other track is kept operational to allow for continuous train services.	To allow execution of scope that can't be completed in Integrated Closures while allowing some services to continue, minimising network impact.	Rail Replacement
Shadow possessions	When asset activity can be completed in sections by taking advantage of areas of the network that are unviable for coal trains due to other renewal or	To maximise scope being completed without consuming additional capacity.	Rail Stress Management

Type	Definition	Key Objectives	Example
	maintenance activity occurring and doesn't consume any additional capacity.		
In-between train services	When smaller asset activity tasks can be undertaken in a safe and controlled manner on track whilst no trains are present or by utilising capacity not required for coal services (in low demand weeks).	To minimise the impact to capacity by working between trains. However, cost could increase due to inefficiencies (waiting access).	Points Maintenance
As a scheduled rail service (moving maintenance or resources)	There are track vehicles or track machines requiring access to perform inspections or maintenance such as, but not limited to, recording cars, high rail inspections, grinding and movement of rail plant.	To complete scope / inspections as efficiently as possible without impacting rail traffic.	Mainline Track Resurfacing
Plan throughs (nil access required)	When asset activity or general maintenance is completed outside the operational areas of the railway having no impact to train services.	To complete scope with no impact to capacity.	Fault Inspection

Asset Activity Undertaken During Integrated Closures

In planning for the execution of works in integrated closures, particularly for critical path work packages, consideration is given to the scope planned to be delivered and whether a portion may be able to be undertaken prior to the closure. Strategies used to manage the work include consideration of:

- whether activities can be split across multiple closures
- scheduling work activity whilst the system is in ramp up or ramp down, e.g. as consists are being stowed in preparation for the closure
- ensuring that the work site has adequate access, or if prework may be completed to improve access (and safety) prior to the start of the closure
- consideration given to asset condition as related to safety and operational performance and the associated interruptions to supply chains
- locations of laydown areas or equipment pads
- lead times to source and transport material
- activities which can be performed in parallel
- interface management requirements and assignment of resources for these, including isolations, protection; and
- access to key plant and labour resources e.g. resurfacing plant.

Critical Path Activities

- Each year, the closure pattern is driven by required renewals scope. For every integrated closure there is typically one or more significant renewal activities (i.e. the critical path activities) that will

determine the length of the closure. Critical scope or critical path activities are identified and distributed across the year during the access planning process.

- Other scope in the impacted locations is subsequently identified and planned for delivery within the same possession to ensure that Aurizon Network can maximise the scope of work to be delivered during the time the rail infrastructure is closed.
- Internal resources, contractor availability and other support facilities (e.g. accommodation) are considered to allow for on average 100-150 independent activities per closure. Some spare capacity is maintained to allow for any corrective maintenance to occur within the possession. These activities are often not known until 84 to 28 days prior to the planned closure.
- Other work may be added provided it can be completed safely, does not impact the resources or equipment that are required for the driving activity, and that it will not cause a delay in handing back the track at the expected end of the closure.

Asset Activity Undertaken Outside of Integrated Closures

Not all asset activities can occur within integrated closures due to the limited duration of these possessions, resourcing availability and the nature of delivering these activities.

Mechanised Maintenance and Renewal

Table 110 outlines some of the principles Aurizon Network applies to minimise supply chain impacts when planning activities that take place outside of closures.

Table 110 Mitigating the Capacity Impact of Works That Takes Place Outside of Integrated Closures

Task	Planning Principles
Ballast Cleaning	Ballast cleaning activities are delivered through both integrated closures and single line closures, depending on the requirements of the scope. Supply chain impacts are minimised by planning the highest-impact locations for completion within closures. Where possible, the BCM follows and utilises all systems closures to minimise its requirement for access outside of closures.
Rail Grinding	Rail grinding is a planned activity with frequency rates defined within track standards. The frequency is dependent on the track alignment, i.e. more grinding is required on curves than on straights. Planning is based on when track sections will reach throughput triggers. As a result of throughput triggers, grinding activity may vary from year to year to ensure stable management of rail condition.
Track Resurfacing	Track resurfacing is a planned task triggered by geometry condition deterioration to rectify identified defects after inspections. Track resurfacing is also undertaken as part of renewal activities where the track has been disturbed. This activity is planned between coal trains to minimise impact.
Road Runs	On-track inspections as part of the planned inspection strategy mandated by the SMS. Road Runs are a cyclic activity conducted each 96 or 192 hours dependant on location. Road runs are activities planned as part of the MRSB process.
Asset Inspections	Asset inspections include track geometry measurements, overhead alignment (Blackwater and Goonyella), fault identification and ultrasonic rail testing. This work can vary in terms of capacity impact, typically it will be packaged and aligned to integrated closures, single line possessions, or where possible, in between revenue services.

Non-Mechanised Asset Activity

Where possible, Aurizon Network plans non-mechanised asset activities to take place in the shadow of other work to minimise potential adverse impacts on train operations or system capacity. This allows multiple activities to occur simultaneously without consuming additional capacity.

An asset activity may also be planned and delivered after the Intermediate Train Plan has been laid down (which allows flexible activities to be planned in the spaces between trains) or in-between trains on the day of operations. This is achieved through direct consultation with Train Control. Where asset activities can be conducted efficiently and safely between trains, Aurizon Network’s operational teams will opportunistically utilise this time to minimise the impact of required asset activity on supply chain operations.

Asset activities that can be planned in this manner are outlined in Table 111.

Table 111 Activities that can be Completed Within Shadow of Other Asset Activity or In-Between Trains

Activity
Inspections and walkouts
Preventive maintenance and repair of signalling, overhead and civil components (e.g. rail lubricators)
Top and line spot resurfacing
Glued Insulated Joints (GIJ) management
Fencing
Fire and vegetation management
Access Points / Access Roads
Drainage
Monument and signage maintenance
Power systems

Key Plant and Equipment Utilised in Work Execution

Aurizon Network uses a combination of owned and operated and external sourced plant and equipment. The decision to in-source is based on level of specialisation and availability in the market, baseload scope to support utilisation, dependency of scope delivery on availability of plant and equipment and ability to respond to incidents. A large proportion of plant and equipment from external suppliers is procured under wet-hire contracts and the rail grinding contract. The major owned and operated equipment relate to resurfacing, ballast cleaning and other minor plant and equipment including that required for vegetation control.

Resurfacing

Aurizon Network’s resurfacing plant was progressively put into operation between 2013 to 2016 and replaced its aging fleet of tampers and regulators. The newer high production resurfacing plant are more efficient and can deliver the required scope of work with less track time.

Aurizon Network also has a resurfacing consist (MMA 505 Tamper and MMB 505 Regulator) that primarily supports the ballast cleaning operation.

The Resurfacing Plant are not dedicated to any individual Coal System, which provides flexibility for each resurfacing consist (comprised of an MMA and MMB machine) to be planned in a way that provides operational efficiency.

Ballast Cleaning

Ballast cleaning is made up of two specific items being the Ballast Cleaning Machine and, Excavator undercutting.

Ballast Cleaning Machine (BCM) is undertaken by the RM902. RM902 is most efficient at delivering undercut and shoulder cuts simultaneously over longer sections. The RM902 entered production in May 2021.

Excavator Undercutting is undertaken using contractors (work packages). Excavator undercutting is appropriate for smaller sections, turnouts and/ or areas difficult to access either due to location or condition.

Factors impacting delivery of ballast cleaning scope by the above plant and equipment are:

- **Wet weather**
- **Ballast fouling and return rates.** This relates to the moisture content and the presence of clay mixed with ballast contaminants. Heavily fouled ballast is unable to pass through the machine screens, hence is deemed unscreenable and requires all ballast to be replaced (total excavation). This factor has a significant influence on machine production rate with total excavation slowing production. The cost and scope that Aurizon Network can achieve during production is highly sensitive to changes in asset condition relative to plan. Aurizon Network has sought to mitigate this risk by implementing an additional pre-dig performed approx. 18 months from execution, which is used to inform the planning assumptions for MRSB;
- **Increased ballast depth** results in a higher volume of ballast material required to be processed, reducing the production rate;
- **Machine breakdowns.**

Works Completion and Reporting

From the outset of scope identification, information is captured, built, and stored to enable the planning process, execution, reporting and close out. System statuses in SAP allow users to indicate the readiness for scope to pass from one step in the process to the next. As work progresses, the scope, plan and actuals are captured in SAP consistently and enables the monthly, quarterly, and yearly financial reporting of actuals against planned scope and budget to the RIG. Work moves from a notification to a work order in SAP. Purchase orders are attached to work orders when work is procured externally.

As scope is identified through to execution, the status of the work is updated, and artefacts are retained in SAP to support decisions. This information is used to report on the status of the work and ultimately informs reporting and trend analysis for performance improvement. When work is identified as commissioned (or Technically Complete) it is included as part of the Capital Claim process.

During the year, closure and completion reports are undertaken which provide information for the Quarterly RIG Report and CAPEX Claim for that financial year. Post closure or completion reviews are also undertaken to improve processes going forward for maintenance and renewal activities.

Engagement and Reporting

Aurizon Network has, in conjunction with stakeholders, developed a pattern of engagement to support the development of the annual MRSB and to provide greater transparency around the delivery of the MRSB for the current year. This engagement is in addition to Aurizon Network's obligations under UT5 and includes:

- The development of an engagement plan in February each year, subject to the approval status of the MRSB escalation to the RIG representative group or affected stakeholders on variations to the approved MRSB; and
- The publication of a Quarterly Report providing relevant information for each Coal System.

Aurizon Network reconfirmed their nominated success criteria for the engagement with the RIG with respect to the FY27 MRSB, and that is:

- Approval of the FY27 MRSB
- FY26 investments accepted into RAB through CAPEX Claim using RIG and Project Reporting
- RIG requests for information and clarification assist Aurizon in decision making; and
- The engagement builds and maintains confidence in Aurizon Network's management and governance of maintenance and renewal activities.

Appendix 7 – Additional Information

This appendix provides a list of informational artefacts that support the approval of the asset maintenance and renewal strategy and budget for FY27.

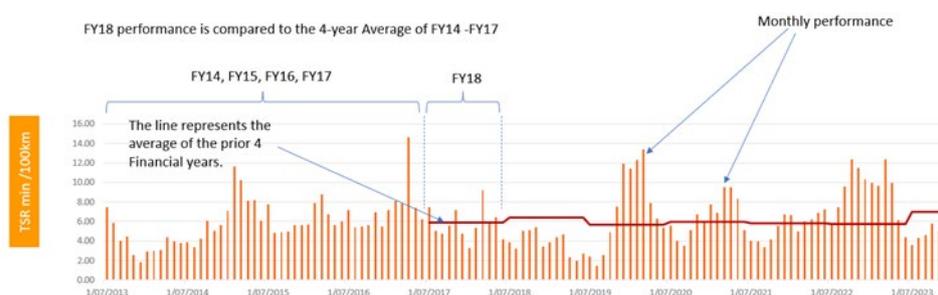
Table 112 List of Items for Additional Information

Item	Description	Link
2025 Sustainability Report		2025 Sustainability Report
2024 Annual Report		2024 Annual Report
2024 Modern Slavery Report		2024 Modern Slavery Statement
2022-2025 Reconciliation Action Plan		2022-2025 Reconciliation Action Plan
Blackwater System Information	Detailed information on the Blackwater System	Blackwater System Information Pack Blackwater System Summary Sheet
Goonyella System Information	Detailed information on the Goonyella System	Goonyella System Information Pack Goonyella System Summary Sheet
Moura System Information	Detailed information on the Moura System	Moura System Information Pack Moura System Summary Sheet
Newlands System Information	Detailed information on the Newlands System	Newlands System Information Pack Newlands System Summary Sheet

Appendix 8 - Glossary

Table 113 Glossary

Term	Definition
2017 Access Undertaking or UT5	Aurizon Network's 2017 Access Undertaking, as approved by the QCA on 19 December 2019, together with any subsequent changes approved by the QCA from time to time.
4-year averages	The average over a 4-year period.



Access Holders	A person or organisation that holds access rights to the Central Queensland Coal Network
ACOM	Communication System
AM	Asset Maintenance
AMRP	Asset Maintenance and Renewal Policy
APS	Advanced Planning and Scheduling
AT Renewal	Autotransformer Renewal
ATIS	Automated Track Inspection System
Aurizon Network	Aurizon Network Pty Ltd, the provider of access services in accordance with the 2017 Access Undertaking
AZJ	Aurizon Holdings Limited
Ballast	Ballast is the material that is laid on the rail bed under the sleepers, providing stability and drainage to the track structure.
Baseload Renewals	Scope that is part of the asset renewal program that includes rail renewal, formation, structures and ballast cleaning.
BCM	High Production Mainline Ballast Undercutter Machine
BOQ	Bill of Quantities
BW	Blackwater
BWG	Ballast Working Group
CAGR	Compounding Annual Growth Rate
Capex	Capital Expenditure
Capital Indicator	An in-principle summary of the extent to which assets in the proposed Renewals Budget would be allocated to each of the Newlands System and GAPE RAB.
CER	Communication Equipment Room
CETS	Civil Engineering Track and Standards
CIPP	Cured in Place Pipe

Term	Definition
CMP	Corrugated Metal Pipe
CMP-CIPP	Corrugated Metal Pipe to Cured in Place Pipe
Condition Based	MRSB Comment – reason for renewal is due to the condition of the asset.
Corrosion	MRSB Comment – reason for renewal is due to corrosion of the asset.
CPI	Consumer Price Index
CQCN	Central Queensland Coal Network
CWL	Central West Line
DBCT	Dalrymple Bay Coal Terminal
Defective Asset	MRSB Comment – Reason for renewal is the asset is defective and no longer performing function effectively.
DMR Link	Digital Microwave Radio Link
DNC	Deliverable Network Capacity
Don't Renew	Let the asset fail or elect not to replace asset.
Drainage Condition Description	<p>Required: very poor condition, compared to all sites in the CQCN have a higher performance impact, higher number of formation failures and a lower \$/t capacity benefit.</p> <p>Very Highly Recommend: Have been assessed as having at least 3 of the 4 benefits of 'Required'</p> <p>Highly Recommend: Poor to very poor condition, with either high history or potential performance impact or high number of formation failures historically.</p> <p>Recommended: Very poor condition with lower historical or potential performance impacts and lower number of formation failures.</p>
DTS	Dynamic Track Stabilisers
EFD	Early Fault Detection
egtk	Electric grow tonne kilometres
Electrical Safety Act	Electrical Safety Act 2002 (Qld)
FD	Final Decision
Fouled Ballast	MRSB Comment – reason for renewal is due to fouling of the ballast.
FOP	Front of Post – a FOP signal is a type of signal.
FTE	Full Time Equivalent
Future Scope	Incorporates the cost of designs relating to structures, level crossings, turnouts and formation to be delivered in future years.
FY	Financial Year
FY22 ARRT	FY22 Annual Review of Reference Tariff submission
FY27 Draft Proposal	Draft Maintenance and Renewals Strategies and Budgets for each Coal System for the Financial Year ending 30 June 2026/2027
GA	Goonyella
GAPE	Goonyella to Abbot Point Expansion
GAPE Link	Greenfield track between North Goonyella Junction and Newlands Junction
GPR	Ground Penetrating Radar – A non-destructive subsurface inspection technology that is used to measure the condition of Aurizon Network's assets, in particular ballast.

Term	Definition
gkt	Gross tonne kilometres
HBD/HWD	Hot Bearing Detector/Hot Wheel Detector
HDPE	High Density Polyethylene Pipe
HPCT	Hay Point Services Coal Terminal
ICAR	Initial Capacity Assessment Report as defined in the 2017 Access Undertaking
IE	Independent Expert
Improve Reliability	MRSB Comment – Reason for renewal is to improve reliability of the asset.
Improve Safety	MRSB Comment – Reason for renewal is to improve safety of the asset
Incident	An incident is an unplanned event that either: <ul style="list-style-type: none"> • Causes or could potentially cause delays to more than one train on the network • Damages or potentially damages the network • Causes or could potentially cause the cancellation of one or more services on the network • Causes excessive unplanned delays on the network.
IOT	Internet of Things
IRJ	Insulated Rail Joint
ITP	Intermediate Train Plan
Like-for Like Renewal	Swap old asset for new. This approach resets engineering life.
LV System Earthing	Low Voltage System Earthing
LX CCTV	Level Crossing Closed Circuit Television
MA	Moura
Maintenance Indicator	An estimate of the share of the proposed Maintenance Budget which would be recovered from each of the Newlands System and GAPE under the current pricing arrangements.
MCA	Multi Criteria Analysis – Engineering analysis tool
MCI	Maintenance Cost Index
MDT	Mean Down Time
MGT	Million gross tonnes
MI	Motorised Isolator
MNT	Million net tonnes
MRSB	Maintenance and Renewal Strategy and Budget
Mt	Million tonnes
Mtpa	Million tonnes per annum
NAMS	Network Asset Management System
NCL	North Coast Line
Newlands System	Significant upgrades and renewal of Newlands System Rail Infrastructure as part of the scope of the GAPE project.
NL	Newlands

Term	Definition
NMS	Communications Network Management System
NSAP	Network Strategic Asset Plan
nt	Net tonnes
ntk	Net tonne kilometres
Obsolescence	MRSB Comment – Reason for renewal is the asset is outdated and no longer used or supported.
OHLE	Overhead Line Equipment
Opex	Operational Expenditure
OTCI	Overall Track Condition Index – a measure of quality of the geometry of the track calculated from track geometry recording vehicle outputs.
Prolong Asset Life	Increase maintenance or do holding works. Will extend life but may require operational risks or restrictions.
PSC Site	Power Supply Cubicle
PVC	Percent Void Contamination – calculated by dividing the volume of contaminates by the volume of voids within the ballast profile. PVC is determined in a compacted state to simulate actual track conditions.
QCA	Queensland Competition Authority
QCA A	Queensland Competition Authority Act (Qld) 1997
QR	Queensland Rail Limited
QRC	Queensland Resources Council
RAB	Regulated Asset Base
Rail Fatigue	MRSB Comment – Reason for renewal due to the rail fatiguing over time.
Rail Wear	MRSB Comment – Reason for renewal due to the wear of rail to friction and heaving loading.
RAIL BAM	Bearing Acoustic Monitor
RBM	Rail Bound Manganese
RCBC	Reinforced Concrete Box Culvert
RCP CIPP	Reinforced Concrete Pipe – to Cure in Place Pipe
Reactive Renewals	Reflects the inclusion of an allocation for scope in response to changes in asset condition in the year of execution. It can relate to turnout components, formation mainline excavator and turnout ballast undercutting.
Relay to PBI	Relay to Processor Based Interlocking
Renew with Longer Life Asset	Renew with stronger asset. Expect longer engineering life than original.
Renew with Shorter Life Asset	Renew with alternate asset. Expect shorter engineering life than original
Reveloc	Processes Radio Location Information
RG TCT	RG Tanna Coal Terminal
RIG	Rail Industry Group
RIM	Rail Infrastructure Manager

Term	Definition
RIW	Rail Infrastructure Workers
RMS CT	Remote Monitoring Systems Current Transducer
RTF	Rail Transfer Facilities
SDH to IP	Synchronous Digital Hierarchy to Internet Protocol
SI Replacement	Sunny Island Inverter Replacement (Control Systems)
Single line possessions	When asset activity can be completed on one track in a duplicated section whilst the other track is kept operational to allow for continuous train services.
Sleeper Type Change	MRSB Comment – Reason for renewal due to the change in sleeper material or technical type of sleeper.
SMS	Safety Management System
Strategic Scope	Reflects cyber security, interlocking, Goonyella Ports, small components, autotransformers, traction substations and TETRA radio programs of work.
TC to Axle Counter	Track Circuit to Axle Counter
TETRA	Terrestrial Trunked Radio System
TLM	Track Laying Machine
TRSA	Transport (Rail Safety) Act 2010
TSR	Temporary Speed Restriction
Turnout	A section of railway track-work that allows trains to pass from one track on to a diverging path.
UT5	Aurizon Network's 2018 Access Undertaking, as approved by the QCA on 19 December 2019 and subsequently amended from time to time.
UTC	Universal Train Control
VPI Replacement	Vital Processor Interlocking (a form of PBI)
Wear – removing 107lb rail	MRSB Comment – Reason for renewal due to work, old 107lb/yd rail being replaced with modern day equivalent.
WICET	Wiggins Island Caol Export Terminal
WIRP	Wiggins Island Rail Project