Explanatory Submission – Queensland Rail's Draft Access Undertaking 1 (2015)

Volume 2

May 2015

Table of Contents

Executive Summary

This Volume sets out Queensland Rail's submission on the proposed West Moreton coal Reference Tariff to apply for the term of the 2015 Draft Access Undertaking (2015 DAU), from the date of its approval until 30 June 2020.

The environment for coal and non-coal services has changed markedly since the 2013 DAU was submitted, with both coal and non-coal volumes declining. This has seen lower contracted tonnages and the operation of more ad hoc train services. While the long term outlook remains positive for coal volumes, the current environment presents particular challenges for setting tariffs. Queensland Rail recognises the importance of coal producers continuing to use the West Moreton Network while also balancing this against ensuring that Queensland Rail can recover its efficient costs and a return, consistent with the pricing principles in the *Queensland Competition Authority Act 1997* (QCA Act).

Proposed reference tariff

Having regard to the changing environment, it is important to make a clear distinction between the establishment of the ceiling price, which reflects the stand-alone economic cost of providing the service[1], and the reference tariff that is actually applied. One of Queensland Rail's concerns is that the QCA's Draft Decision on the 2013 DAU effectively equates the ceiling price with the reference tariff to be applied in the next regulatory period, having regard to issues such as affordability and the pressure on producers' operating margins.

The purpose of the ceiling price is to set the maximum price that could be levied before a new entrant might be induced to bypass the network. Once the ceiling price has been determined, a number of considerations will then influence whether the tariff will be set at or below the ceiling, which at the current time, includes the challenging market environment. In setting the tariff Queensland Rail is highly incentivised to seek out mutually beneficial arrangements that support the long-term sustainability of the industry, as the cost and risk to Queensland Rail of volume reductions is high.

Queensland Rail therefore accepts that, in the current circumstances, its determined ceiling price[2] is in fact higher than the commercially prudent access charge. Notwithstanding this, Queensland Rail does not support attempts to manipulate the building block methodology to derive a tariff that more closely resembles the 'commercially prudent' price as this will invariably come at the expense of Queensland Rail's ultimate ability to recover its long term sunk investment if and when traffic volumes improve and would create an inappropriate regulatory precedent for other pricing decisions.

In the long run it would also effectively result in a transfer of value from the Government sector to the private sector, as reducing the Government owned Queensland Rail's ability to earn a return on its sunk investment will create greater opportunities for profit by the privately owned mining companies.

[1] Note, the approach proposed by Queensland Rail reflects the stand alone cost of all services on the West Moreton Network, but allocates costs between coal and non-coal services to arrive at the ceiling price for coal services.

[2] Referred to in the 2015 DAU as the Ceiling Reference Tariff

In developing this proposal, Queensland Rail has therefore separately assessed:

- the appropriate ceiling price for coal services on the West Moreton Network; and
- the reference tariff that it proposes to apply.

Queensland Rail proposes that the 2015 DAU base reference tariff will reflect the continued application of the current reference tariff of $19.14/'000gtk (1 July 2014 $s). Escalating this current tariff to the proposed commencement date of the 2015 DAU will give a reference tariff of $19.41/'000gtk at 1 July 2015. Queensland Rail has selected this tariff on the basis that it is a continuation of the current tariff, which itself was previously assessed by the QCA as being reasonable for application in the West Moreton Network. Further, Queensland Rail is satisfied that there is demand for capacity at this price.

Consistent with the approach historically adopted, Queensland Rail proposes to:

- recover overall revenues through a broadly equal split of train path based charges and gtk based charges; and
- apply the tariff developed for the West Moreton Network to the Metropolitan Network.

In addition, Queensland Rail has separately identified the tariff components applying in the West Moreton and Metropolitan Networks, and will separately recover the incremental capacity expansion capex through an incremental capacity charge added to the path-based (AT2) tariff component relating to each Network. Further, Queensland Rail has included prior incremental capacity expansion capex in an opening Incremental Regulatory Asset Base (Incremental RAB) for the Metropolitan Network. While this results in a small increase in the total reference tariff, it also enables the payment of rebates to mining companies in relation to user funded capex within the Metropolitan Network. This is consistent with the approach recommended by the QCA in its Draft Decision on the 2013 DAU.

Application of this approach gives rise to the following tariff structure:

Table 1 Proposed Reference Tariff (1 July 2015)

Loading Facilities	AT1 WM $/'000gtk	AT2 WM $/path	AT1 M $/'000gtk	AT2 M $/path		
				Base	Inc	Total
Jondaryan, Macalister & Columboola	9.71	3,259.66	9.71	1,337.82	230.50	1,568.33
Ebenezer	-	-	19.41	-	230.50	230.50

Jondaryan, Macalister and Columboola services will pay all four tariff components, while Ebenezer will only pay the two tariff components relating to the Metropolitan Network.

Proposed MAR and ceiling price

The ceiling price has been established based on a two-step process. First, a whole of West Moreton Network Ceiling Revenue Limit was determined based on the building blocks approach, which assesses the efficient stand-alone costs of providing network services, including a return on capital (this is also referred to as maximum allowable revenue or MAR). Second, an allocation was made between coal and non-coal traffics in order to arrive at a MAR for coal services.

Queensland Rail has prepared a forecast of efficient costs over the 2015-2020 period for the purpose of assessing the MAR. The resulting ceiling price is $34.92/'000gtk (1 July 2015 $s), which is a sharp increase from that determined for the 2013 DAU. The overwhelming factor contributing to this is the changed market outlook, for both coal and non-coal services.

Based on Queensland Rail's review of the QCA's Draft Decision on its 2013 DAU, one of the more contentious issues in this MAR is the value of the Regulated Asset Base (RAB).

The opening asset value proposed by Queensland Rail in the 2013 DAU was based on a roll forward of the value adopted by the QCA in 2009. That value was based on a Depreciated Optimised Replacement Cost (DORC) assessment by the QCA's consultant, Everything Infrastructure.

For the 2015 DAU, Queensland Rail's proposed asset value reflects its 2013 DAU proposal, with:

- minor adjustments, done so that Queensland Rail can adopt the QCA's recommended approach that all capex should be included in the asset value, but applied so that the resulting value should be allocated between coal and non-coal services based on forecast usage; and
- inclusion of interest during construction which was not considered in the original valuation, and which the QCA has accepted as a legitimate inclusion in its Draft Decision.

This value is then rolled forward to 30 June 2015, based on the standard regulatory approach, which adjusts for inflation, depreciation and capex over the two year period. This arrives at an opening asset value for the 2015 DAU of $487.5 million (1 July 2015), which includes both common network and coal specific assets.

Queensland Rail notes that in its original DORC valuation conducted in 2014 as part of the release of its initial Consultation Paper, the QCA's consultant, B&H, arrived at a value that was very close to (within 2% of) Queensland Rail's proposed 2013 DAU value.

In its Draft Decision on the 2013 DAU, the QCA has subsequently sought to reconsider the opening value of the West Moreton Network asset base, moving away from its own methodology, by proposing a modified approach to the DORC valuation, which places a zero value on certain assets. One of the principles that underpinned this was that life expired assets should be excluded from the initial asset base as this would result in 'double recovery' of the investment.

This has resulted in the QCA instructing B&H to prepare a revised asset value, causing a reduction to the asset value of 42%. Queensland Rail also highlights that B&H's original valuation, which was within 2% of the value it proposed in the 2013 DAU, was based on what is currently known about the age and condition of the assets.

It is generally recognised that when establishing the opening asset value, the DORC valuation is forward-looking. This is accepted regulatory practice in Australia, noting that in the majority of cases regulation has been applied to brownfields assets. Queensland Rail believes that the QCA's modified DORC approach fundamentally changes the methodology from a forward-looking to a backward-looking assessment. Noting that this is inconsistent with accepted regulatory practice, Queensland Rail could not have previously contemplated that such an approach would be applied, nor could it anticipate that this change in approach could see the opening asset value reduced by 42%.

Queensland Rail's other key concerns are that:

- The QCA has referred to issues such as affordability in setting the opening asset value. The opening asset value is being established for the purpose of setting the ceiling price. Issues such as affordability are not relevant to the assessment of the ceiling price.
- As noted above, the QCA has rationalised setting the value of certain assets at zero based on concerns regarding double recovery of costs. However, the QCA has not undertaken any investigation of whether Queensland Rail has actually fully recovered a return on and of capital for these assets, recognising that the capacity of users to pay has historically been limited. With an impact of a reduction of 42% of the West Moreton asset base, conclusive evidence is required to support the assertion that there has been double recovery of costs.
- The QCA has not properly considered the effect of excluding assets as valuing assets at zero, even where they have remaining service potential is the same as excluding them for pricing purposes. This highlights that the QCA's approach is not forward-looking, which would have regard to the remaining service potential of the assets. Further, the QCA has ignored the fact that certain assets have been renewed since they were originally constructed, which has extended their useful asset lives.

Queensland Rail therefore does not accept the QCA's proposed valuation or the backward-looking approach it has used to derive it. The QCA's proposed outcome may prevent Queensland Rail from fully recovering its sunk investments and also provides a significant disincentive to undertake new investment.

The other potentially contentious key issue is the approach used to allocate assets and costs between coal and non-coal services.

A number of cost components, including operating costs and future capex, are allocated based on a train path allocator which is intended to reflect the relative usage between coal and non-coal services. Queensland Rail has based this train path allocator on the relative forecast usage by coal and non coal services over the regulatory period.

When considering this issue in its Draft Decision, the QCA proposed that these cost categories be allocated based on coal's share of total '*available'* paths, rather than its share of forecast usage. Queensland Rail cannot accept this approach. With only 53 of the 112 available weekly paths currently contracted, and 62.8 expected to be utilised this regulatory period, such an approach will prevent Queensland Rail from recovering its efficient costs including a return. This is inconsistent with the pricing principles in the QCA Act. By basing the allocator on forecast usage, this will result in an allocation that is more aligned with expected activity and importantly, provides Queensland Rail with a greater opportunity to recover its efficient costs including a return.

In terms of the asset base, Queensland Rail:

- proposes to allocate all post-1995 assets based on coal's share of forecast train path usage (as discussed above), but capped at a level that reflects the Government imposed constraints on contracting paths to coal. This results in a capped allocation of 77.7% of the opening asset value to coal;
- does not accept the QCA's proposed adjustment factor for the metropolitan blackout period for pre-1995 assets. Queensland Rail considers that the QCA's approach to deriving the adjustment is flawed, resulting in it being materially overstated. Queensland Rail has proposed a factor of 12.1%.

For the other key components of the building blocks, being the cost forecasts, return on capital and depreciation, the difference between Queensland Rail's proposal in the 2015 DAU and the QCA's Draft Decision are less material.

Introduction to Volume 2

This document is Volume 2 of the explanatory submission that accompanies the Draft Access Undertaking (DAU) submitted by Queensland Rail (Queensland Rail) to the Queensland Competition Authority (QCA) on 5 May 2015 (the 2015 DAU). This volume addresses and explains Queensland Rail's proposed reference tariffs to apply to the operation of coal services in the West Moreton and Metropolitan Networks.

West Moreton Network characteristics

The West Moreton Network spans 314km from Rosewood to Miles and connects Surat Basin coal mines (as far west as Columboola) with the Port of Brisbane (Fisherman Islands) through the Metropolitan Network.

Historically the West Moreton Network catered for passenger, livestock, freight and agricultural products with the first section of railway line in Queensland, between Ipswich and Grandchester, opening in 1865. Heavy haul Coal carrying train services commenced on the West Moreton Network in 1994, with volumes progressively increasing as mines were developed and/or expanded.

As the network was initially designed to cater for non-coal traffics, investment in infrastructure improvements, by both Queensland Rail and West Moreton Network end-users, has been necessary to accommodate coal carrying train services. Being built on a black soil plain and having tight radius curves down the Toowoomba and Little Liverpool Ranges has created additional challenges.

As will be outlined in Part 1, the environment has changed markedly since the 2013 DAU was submitted. Volumes have declined with one of the three coal mines on the network, Wilkie Creek, closing in December 2013. Contracting behaviour has also changed given the network is currently not capacity constrained, with lower contracted tonnages and users running more paths on an ad hoc basis. While the long term outlook for coal volumes still remains positive, the current environment presents particular challenges for setting tariffs.

History of tariff development

Tariffs for the West Moreton Network were first developed as part of QR Limited's second access undertaking, which was approved in 2006 and covered what are currently Queensland Rail's and Aurizon Network's rail infrastructure. At the time, the West Moreton Network was capacity constrained. The QCA rejected QR Limited's proposed replacement cost approach although indicated that it would consider a cost-based approach, based on DORC, if it met certain requirements[3]. The QCA's approved tariff was benchmarked against the Moura system. The QCA acknowledged the difficulties in assessing a tariff for the West Moreton Network and that 'it would be possible to arrive at a lower or higher tariff depending on the weighting given to a range of factors.'[4]

[3] Queensland Competition Authority (2005a). Decision, QR's 2005 Draft Access Undertaking, December.
[4] Queensland Competition Authority (2005a). p.76.

In its 2009 DAU, QR Network (now Aurizon Network) developed a ceiling price based on a stand-alone cost methodology and proposed a reference tariff below that ceiling price. In its 2009 Draft Decision, the QCA rejected QR Network's proposed ceiling price and tariff, arriving at a ceiling price that was based on a similar approach but using different input assumptions. This included a DORC valuation assessed by the QCA's consultant, Everything Infrastructure, which modified Connell Hatch's DORC valuation originally proposed by QR Network. The QCA stated that the tariff it derived using this approach was 'effectively a ceiling price for the Western System'.[5] It accepted QR Network's argument that the tariff developed to apply west of Rosewood could also be applied to the Metropolitan Network.

QR Network accepted the QCA's revised tariffs as set out in its Draft Decision and submitted these in its 2010 DAU. These tariffs were approved by the QCA. However, it should be noted that the 2010 DAU was prepared and approved immediately prior to the privatisation of the Aurizon Group and that the 'Western System' was not one of the privatised assets.

2015 DAU Proposal

As noted above, circumstances have changed considerably since the 2013 DAU was submitted. Due to this, Queensland Rail withdrew its 2013 DAU in December 2014 to enable it to take account of the changed circumstances (including the closure of the Macalister Mine) and to be able to properly consider matters raised in the QCA's October 2014 Draft Decision, which materially varied from the QCA's previous positions and accepted regulatory practice in a range of areas.

Queensland Rail has developed a revised proposal for its 2015 DAU, having regard to the requirements of the QCA Act, including the pricing principles. While Queensland Rail recognises that the QCA has stated that it sought to take these into account, it is concerned that the QCA's assessment does not fully consider the implications of its tariff proposal against these criteria. In particular, Queensland Rail does not consider that the QCA's proposal as set out in its Draft Decision meets the requirements of section 168A(a), which is that prices must:

> *…generate expected revenue for the service that is at least enough to meet the efficient costs of providing access to the service and include a return on investment commensurate with the regulatory and commercial risks involved…*

For the reasons that will be set out in this Volume, Queensland Rail is concerned that the QCA's tariff proposal in its 2014 Draft Decision, if implemented, would not allow Queensland Rail to recover the efficient costs of providing the service, and will serve as a strong disincentive for it to commit to any form of investment (either expansion or renewal) in the West Moreton Network. A reference tariff set at the level proposed in the 2014 Draft Decision would arguably not allow Queensland Rail to satisfy its statutory obligation to act commercially.

This 2015 DAU has been developed having regard to the network characteristics and history of the development process as outlined above. Specifically, it has been drafted taking into account the outcomes of the industry consultation undertaken to date and, in particular, the QCA's Draft Decision.

[5] Queensland Competition Authority (2009). Draft Decision, QR Network 2009 Draft Access Undertaking, December, p.92.

However, Queensland Rail considers that it is critically important that, consistent with the pricing principles in the 2015 DAU, the ceiling price should be established based on sound economic principles, to reflect the maximum price that Queensland Rail can charge for coal services without venturing into the realms of earning monopoly returns. To the extent that setting the actual reference tariff at a level that will achieve this ceiling price is not commercially achievable, Queensland Rail considers that this needs to be addressed separately to the ceiling price.

Therefore, in developing this proposal, Queensland Rail has separately considered:

- the appropriate ceiling price for coal services on the West Moreton Network; and
- the reference tariff that Queensland Rail proposes to apply.

The reference tariff proposed by Queensland Rail under the 2015 DAU has been assessed based on its forecast costs for the period 1 July 2015 to 30 June 2020. This reference tariff will be applied from the date of the QCA's approval of the 2015 DAU until 30 June 2020.

Structure of this volume

This Volume is structured as follows:

- Part 1 defines the West Moreton Network and presents the volume outlook;
- Part 2 presents Queensland Rail's proposed coal reference tariffs; and
- Part 3 assesses the ceiling price to apply to West Moreton coal services, using the following process:
    - Assessment of the appropriate building block components for the whole of West Moreton Network;
    - Determining the appropriate allocation between coal and non-coal traffics; and
    - Based on these inputs, deriving a maximum allowable revenue and ceiling price for coal services in the West Moreton Network.

Part 1 – West Moreton reference tariff and volume outlook

1.1 Application of West Moreton reference tariff for coal

The 2015 DAU proposes a reference tariff that will apply to all coal-carrying train services using the West Moreton and Metropolitan Networks. This includes loading points at Ebenezer, Jondaryan (New Acland mine), Macalister (Wilkie Creek mine, currently closed) and Columboola (Cameby Downs mine).

The railing of coal from the Wilkie Creek mine began in 1994, with Macalister as the loading point. Following the development of the New Acland mine, railings from Jondaryan commenced in 2002. The final Surat Basin mine utilising the West Moreton Network, Cameby Downs, began operations in late 2010 with train services transporting coal from Columboola.

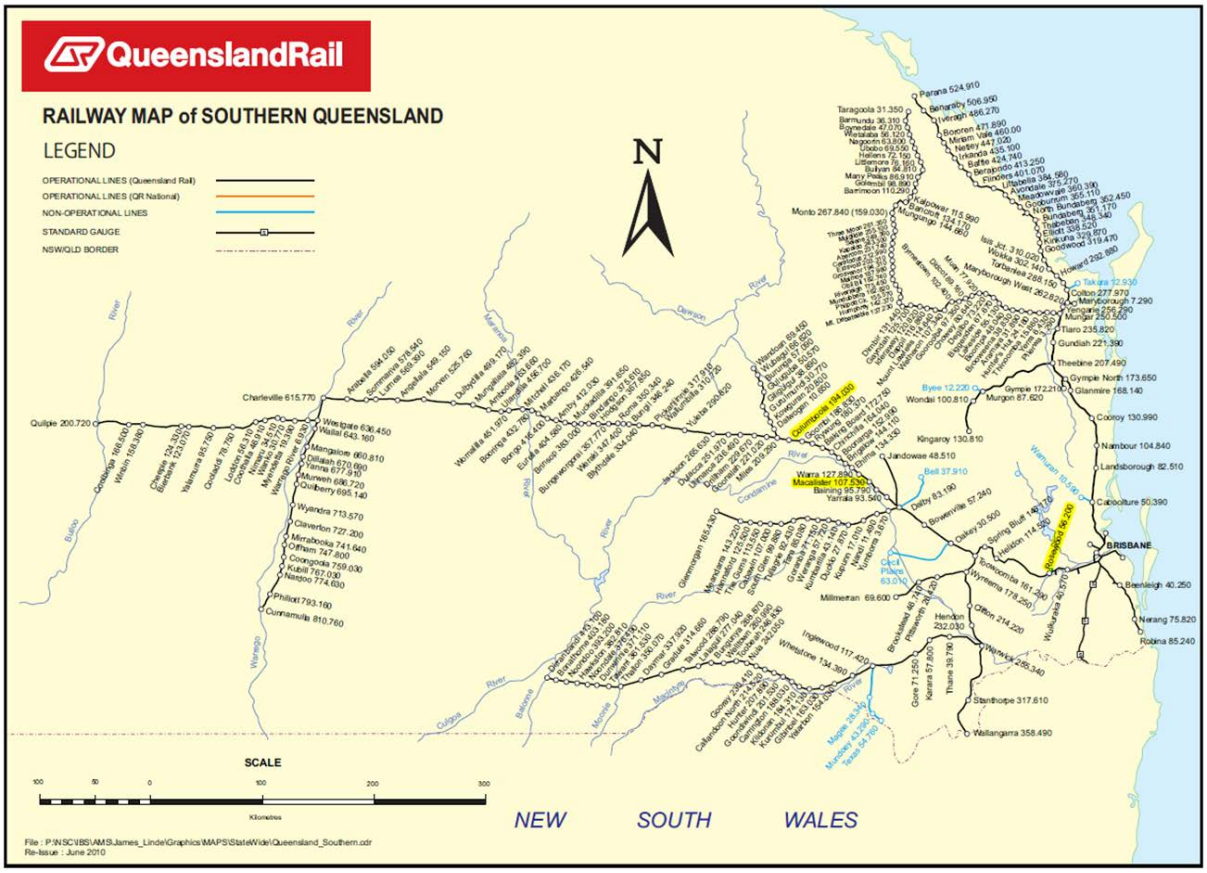
The West Moreton reference tariff extends from the Port of Brisbane in the Metropolitan Network to Columboola in the West Moreton Network. This means the West Moreton reference tariff includes the following segments:

- the Metropolitan Network, which covers the route from Fisherman Islands to Rosewood; and
- the West Moreton Network between Rosewood and Columboola.[6]

The route of the West Moreton reference tariff is illustrated on the following map:

[6] While the West Moreton Network extends 314km from Rosewood to Miles, the West Moreton reference tariff and the West Moreton reference tariff ceiling price are based upon building blocks (e.g. maintenance costs, capital expenditure etc.) that only apply as far as Columboola and do not apply to the section of the West Moreton Network between Columboola and Miles. This is because coal services do not travel west beyond Columboola.

Figure 1 West Moreton map



Queensland Rail's detailed proposal in relation to the application of a reference tariff for both the West Moreton Network and the Metropolitan Network is addressed in Part 2 of this volume.

The 2015 DAU considers the West Moreton Network in the context of the following two major route sections:

- Rosewood to Jondaryan; and
- Jondaryan to Columboola.

Therefore, the building block assessment of costs and volumes for the West Moreton Network are separately assessed for these two component route sections. The breakpoint at Jondaryan reflects the point at which volumes significantly reduce, with there being higher volumes east of Jondaryan as compared to its west.

This contrasts with the 2013 DAU, which considered the West Moreton Network within the context of the following two major route sections:

- Rosewood to Macalister, and
- Macalister to Columboola[7].

However, the 2015 DAU methodology takes account of the closure of the Wilkie Creek mine, which occurred subsequent to the lodgement of the 2013 DAU and which has resulted in the point at which volumes change moving from Macalister to Jondaryan.

[7] This allocation reflected that the reference tariff in '*QR Network's Access Undertaking (2008) June 2010*' (2008 AU) only applies as far as Macalister.

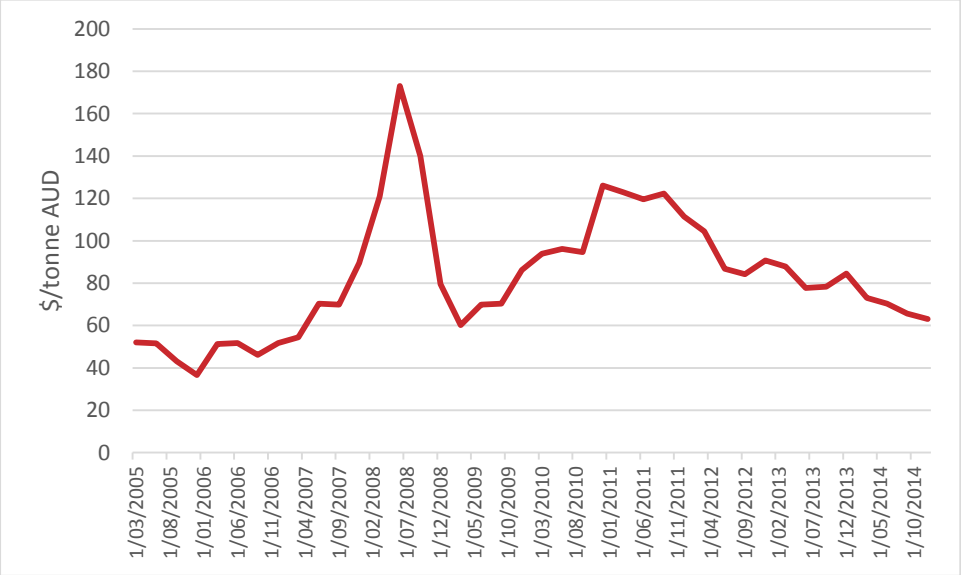
1.2 West Moreton Network volume outlook

1.2.1 Forecast coal services

1.2.1.1 Coal market outlook

The current difficulties faced by the export coal industry are well known. The West Moreton Network services the Surat and West Moreton basins, which are thermal coal basins. In recent years, demand growth for thermal coal has moderated considerably as a consequence of the reduction in coal prices, as shown in the following figure.

Figure 2 Newcastle Thermal Coal price (quarterly)



Source: Bloomberg

The following table shows production for the last five years in the three coal mines in the West Moreton Network. As noted above, the Wilkie Creek mine closed in December 2013.

Table 2 Exports by mine (million net tonnes)

Mine	2009-10	2010-11	2011-12	2012-13	2013-14
Cameby Downs	-	0.433	1.433	1.274	1.493
New Acland	3.364	3.853	4.742	4.405	4.757
Wilkie Creek	1.771	1.070	1.598	1.575	0.876

Source: Queensland Government, Exports by Collieries, https://data.qld.gov.au/dataset/coal-industry-review-statistical-tables/resource/54e5e4c4-46a8-4f12-bc57-9936f0a04f23. {Accessed 8 April 2015}

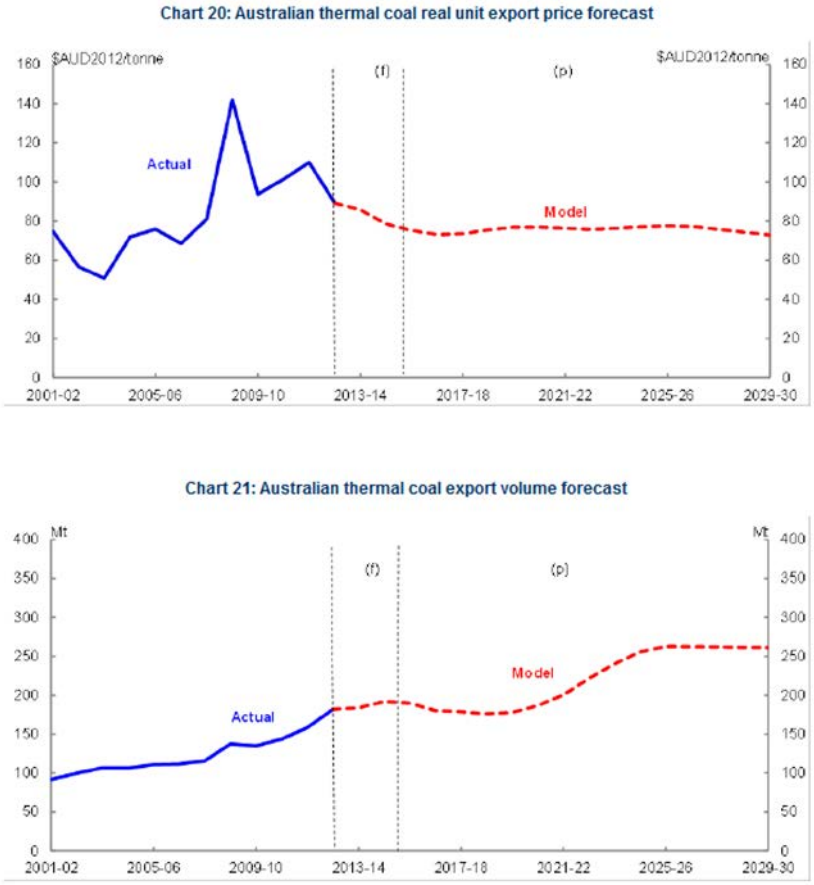
The fall in the thermal coal price has been influenced by a number of factors. On the supply side, producers in major exporting nations such as Australia and Indonesia ramped up production in response to favourable market conditions. 2011-12 also saw a major increase in exports from the United States following a shift in domestic demand from electricity to gas.[8] At

[8] Reserve Bank of Australia (2013). Statement on Monetary Policy, February, p.14.

the same time, import demand also moderated. This includes a reduction in demand from China, which is partially attributed to government policy measures designed to support domestic production.[9] Despite this, Australia increased its market share in key export markets during 2014.[10]

Overall, however, the long-term outlook for thermal coal remains positive. The Commonwealth Treasury forecasts thermal coal exports prices to remain relatively stable in the future, with volumes to be steady over the next five years, before a resumption of growth.

Figure 3 Thermal coal outlook



Source: Australian Government Treasury, Exports of non-rural bulk commodities: thermal coal, ref http://www.treasury.gov.au/PublicationsAndMedia/Publications/2014/Long-run-forecasts-of-Australias-terms-of-trade/HTML-Publication-Import/5-Exports-of-nonrural-bulk-commodities-thermal-coal (accessed 31 April 2015)

The export coal industry is clearly experiencing a challenging market environment and this has been reflected in the volume forecasts for the 2015-20 period, which are lower than the forecasts submitted at the time of the 2013 DAU.

[9] Department of Industry and Science (2015). Resources and Energy Quarterly, March 2015, p.47.
[10] Department of Industry and Science (2015). p.57.

1.2.2.2 Forecast coal services

Basis for forecast

Queensland Rail's 2015 DAU proposal is to base its forecast volumes on its best estimate of actual expected volumes over the regulatory period.

This contrasts with the approach used for the 2013 DAU, where Queensland Rail had proposed that contracted volumes be used as the basis for setting forecast volumes (with coal then contracted for 7.5mtpa or 77 return paths/week and freight/passenger contracts for return 29 paths/week). This was proposed in an environment where the network was almost fully contracted, with contracted paths representing 106 out of a possible 112 return paths on the network.

In its June 2014 Consultation Paper, the QCA noted that contracted volumes had not been achieved.[11] It also noted that while export volumes through Fisherman Islands had exceeded contract, this was due to higher coal railings from the Ebenezer loading point, which only operates in the Metropolitan Network. It stated that:[12]

> *Queensland Rail's proposed volumes therefore appear reasonable, given that past volume forecasts (based on contracts) have not been achieved, and this may be repeated in the future.*

In its Draft Decision, the QCA proposed to accept Queensland Rail's approach to forecasting traffic volumes on the basis of contracted volumes. It also noted concerns raised by New Hope that the use of contracted paths as the denominator for calculating train path allocation would create incentives for Queensland Rail to reduce the number of paths that are contracted and offer more paths on an uncontracted basis. This led the QCA to propose amendments to the approach for train path allocation, which is addressed later in this submission.

Since the 2013 DAU was submitted, there has been a material change in the contracting environment in the West Moreton Network. Rather than the previous environment, where users set their contracts at a level close to, or even above, their usage, users are now comfortable that capacity will be available on an ad hoc basis and are railing significant tonnages in excess of contract (which at least for coal users, was enabled by the closure of Wilkie Creek). In the context of cost allocation, the QCA has previously described contracted volumes as 'verifiable, and reflects clear evidence of customer demand.'[13] Queensland Rail would have previously agreed with this statement. However, contracted volumes no longer provide a reasonable indicator of likely future demand.

Queensland Rail therefore no longer considers it appropriate to use contracted volumes for the purpose of developing its cost and revenue forecasts. Instead, it considers it more appropriate to base its forecasts on its 'most likely' view of actual expected volumes (forecast volumes) over the five year period, which in turn reflects more recent contracting and railing behaviour.

Queensland Rail also notes the concerns previously expressed by New Hope that the use of contracted volumes encourages Queensland Rail to deliberately under contract paths for coal

[11] Queensland Competition Authority (2014a). Consultation Paper, Queensland Rail's Western System Coal Tariffs, p.9.
[12] Queensland Competition Authority (2014a). p.9.
[13] Queensland Competition Authority (2014a). p.9.

and offer more paths on an ad hoc basis.[14] Queensland Rail does not agree with this statement, noting that the recent reduction in contracted volumes has been driven by users. However, Queensland Rail's proposed approach of using forecast volumes (including both contracted and ad hoc services) addresses the concern raised by New Hope, by ensuring that if there is a reasonable expectation of volumes in excess of contract to be railed, these will be included in the volume forecast.

Coal Paths – General

Queensland Rail's assessment of the forecast volumes for the 2015 DAU period is 6.2 mtpa, based on 62.8 return paths per week, 53 of which are currently contracted. This volume profile is assumed to remain constant over the five year period.

This compares to the coal volume forecast submitted in the 2013 DAU (for the 2013 to 2017 financial years) which assumed that volumes would be sourced from three mines, being New Acland (at Jondaryan), Wilkie Creek (at Macalister) and Cameby Downs (at Columboola). The forecast for total coal volumes on the West Moreton Network (west of Rosewood) was 7.5 mtpa, using 77 contracted return paths per week.

As noted above, Wilkie Creek closed in December 2013. Since then, some additional volumes have been transported from New Acland and Cameby Downs. Therefore, in preparing its 2015 DAU forecast, Queensland Rail has assessed forecast volume on a mine by mine basis, as discussed below.

Coal Paths – New Acland Mine

There are currently railing from the New Acland mine:

- [redacted] contracted return paths per week; and
- [redacted] ad hoc return paths per week (on average over the current financial year),

resulting in [redacted] return paths per week being included in Queensland Rail's forecast of 62.8 return paths per week.

Using the reference train service, the proposed [redacted] return paths will transport [redacted] mtpa, which is approaching the New Acland Mine capacity and is consistent with New Acland mine tonnages for the 2013-14FY[15]. Any material increase in railings from [redacted] return paths per week would be expected to result in the need for capacity expansion at the mine.

There is the potential for a future increase in volumes due to New Hope's stated plans in 2017 for its Stage 3 expansion of the New Acland mine, something that Queensland Rail would welcome. However, there remains substantial uncertainty over whether the Stage 3 expansion will proceed.

It is also understood that New Hope may look to significantly scale back its operations if this expansion does not proceed. Given the uncertainty around the expansion, Queensland Rail has not included potential Stage 3 tonnages in the 2015 DAU forecast. However, it is not appropriate to assume a substantially scaled back operation at this point. Hence, Queensland Rail has based its 2015 DAU forecast on a continuation of the current volume from the New Acland mine, being [redacted] return paths per week.

[14] Queensland Competition Authority (2014b). Draft Decision, Queensland Rail's 2013 Draft Access Undertaking, p.145.
[15] In 2013-14 4.571mtpa was railed from New Acland mine.

Coal Paths – Columboola Mine

The 2015 DAU volume forecast is further built up by assuming:

- The current [redacted] contracted return train paths per week from Columboola; and
- An additional two ad hoc train services per week,

resulting in a forecast of [redacted] return paths per week being applied by Queensland Rail for this mine.

Yancoal ran on average [redacted] return paths per week during 2013-14 and at the date of this submission has averaged [redacted] return paths per week for the 2014-15, which is consistent with Queensland Rail's forecast from the Columboola mine.

Coal Paths – Macalister Mine

The Macalister mine has closed. Therefore, an allocation of tonnages from this mine has not been included. While Queensland Rail has since received several access applications to rail from Macalister mine (including one current access application), these have not reached a level of certainty that would justify including forecast tonnages from the Macalister mine in the 2015 DAU volume forecast.

Forecast Coal Path Summary Table

The below table summarises the 2015 DAU's forecast return train paths per week per mine

Table 3 Forecast return train paths per week by mine

Mine	Contracted	Ad Hoc	Total
Cameby Downs	[redacted]	[redacted]	[redacted]
New Acland	[redacted]	[redacted]	[redacted]
Wilkie Creek	[redacted]	[redacted]	[redacted]
Total	**53**	**9.8**	**62.8**

1.2.3 Forecast non-coal services

1.2.3.1 Current non-coal freight market outlook

Agricultural products constitute the main type of non-coal freight transported on the West Moreton Network. Grain traffics account for the highest share of non-coal volumes. Livestock and containerised agricultural products, such as cotton, have also been transported by rail.

These products are destined for domestic and export markets. Demand for these services is inherently seasonal, with production influenced by climatic conditions from year to year. Volumes are influenced by a number of factors, including rainfall and climate, economic conditions, world prices, exchange rates and government policies (including trade agreements). For example, in recent years there has been a significant drop in livestock volumes as a consequence of the drought.

However, in the longer term, the key issue for the West Moreton Network is the transfer of non-coal volumes from rail to road. In the last few years, Queensland Rail has observed a dramatic

reduction in non-coal freight transported on the West Moreton Network, due to a transfer of transport mode to road.

This was subject to a specific inquiry by the Queensland Parliament, concluded in 2014.[16] This inquiry was initiated in response to the observed shift by the agricultural sector away from rail transport. It noted that in Queensland, the transport of livestock and agriculture is heavily skewed towards road, with between 70% and 100% of individual commodities transported by road, which is above the average (69%) for road freight.[17] It observed that:[18]

> *The Committee is extremely concerned that the agriculture industry has been increasingly choosing to use road freight over rail freight in Queensland and that this trend is having serious consequences in relation to road congestion, road maintenance costs the environment and safety. Without targeted intervention by the State Government there will be further decline in rail freight use with significant consequences for Queensland's roads, the community and the state's economy.*

Queensland Rail has seen this trend increase following the decentralisation of the wheat market. Prior to this occurring tonnage movements were managed in a more coordinated way. Now, there are multiple grain handlers in the market with their own objectives and strategies.

The second main issue influencing modal choice has been road pricing. This has achieved some focus at a national level, with the Productivity Commission completing a review in 2007 and, more recently, the Competition Policy Review also addressing this issue.

One of the responses to this was a review of heavy vehicle charging, resulting in the establishment of the Heavy Vehicle Charging and Investment Reform project, which ceased operation in 2014. It is understood that the Transport and Infrastructure Council was to present advice on the next steps to longer term reform at the December 2014 COAG meeting.[19] Heavy vehicle registration charges increased by 1.3% from 1 July 2014 and the Queensland Government is yet to consider the recommended charges to apply from 1 July 2016.[20] It is noted that the Queensland Parliament's inquiry recommended continued involvement in the Heavy Vehicle Charging and Investment Reform project, "with the aim of achieving more equity in the contribution paid by rail and road freight providers towards the cost of infrastructure".[21]

The recent Competition Policy Review also highlighted that a lack of proper road pricing leads to inefficient road investment and distorts choices between transport modes, particularly between road and rail freight, leading to its recommendation that "Governments should introduce cost-reflective road pricing with the aid of new technologies, with pricing subject to independent oversight and revenues used for road construction, maintenance and safety."[22]

While Governments remain positive about opportunities to increase rail's modal share, efforts to achieve this are likely to be focused on the major transport corridors. At this stage, having regard to the implemented and proposed reforms, there is little evidence that there will be a

---

[16] Transport, Housing and Local Government Committee (2014). Rail Freight Use by the Agriculture and Livestock Committee, Report No.45, Queensland Parliament, June.
[17] Transport, Housing and Local Government Committee (2014). p.14.
[18] Transport, Housing and Local Government Committee (2014). p.8.
[19] Department of Transport and Main Roads, National Heavy Vehicle Charges, http://www.tmr.qld.gov.au/business-industry/Heavy-vehicles/National-heavy-vehicle-charges.aspx. {Accessed 14 April 2015.}
[20] Department of Transport and Main Roads, National Heavy Vehicle Charges, http://www.tmr.qld.gov.au/business-industry/Heavy-vehicles/National-heavy-vehicle-charges.aspx. {Accessed 14 April 2015.}
[21] Transport, Housing and Local Government Committee (2014). p.9.
[22] Harper Review Committee, Competition Policy Review, Final Report (2015). P.38.

significant shift from road back to rail (particularly in the West Moreton Network) at any time in the near future.

1.2.3.2 Forecast Non-coal services

Since 2013, all access agreements for non-coal freight services have expired, and the operator of those services has chosen to not contract for freight paths, but rather to run ad hoc services as required. As noted above, there has been a dramatic move from rail to road transport for agricultural products in this region, with average current usage now being one return freight service per week. Queensland Rail continues to supply two return paths per week for passenger services.

For the 2015 DAU, Queensland Rail has based its forecast of non-coal volumes on average current usage, consistent with the approach now being adopted for coal services. Based on this information, only three non-coal return paths per week are expected to be used. Consistent with the comments above on the outlook for freight services, and particularly noting that there is little evidence that there will be a significant shift from road back to rail, Queensland Rail has assumed that this volume profile will be constant over the five year regulatory period.

This contrasts with the non-coal freight and passenger volumes adopted for the 2013 DAU, which reflected the then contracted levels of 29 return paths per week (27 of which were for freight services, and 2 for passenger).

1.2.4 Summary of forecast volumes

Queensland Rail's forecast volumes for the West Moreton Network for 2015-20 are presented in the following table.

Table 4 2015-20 volume forecast (2015-2020)

Loading point	Forecast weekly return paths	Annual					
		One way paths	Net tonnes (million)	Fisherman Islands to Rosewood '000gtks[a]	Rosewood to Jondaryan '000gtks	Jondaryan to Colum-boola '000 gtks	Total Haul '000gtks
Jondaryan	[redacted]						
Macalister	[redacted]						
Columboola	[redacted]						
Total Coal	62.8	**6,280**	**6.154**	**866,138**	**1,666,223**	**444,155**	**2,976,517**
Non Coal	3	**300**	**N/A**	**N/A**	**30,916**	**14,873**	**N/A**

a Excludes Ebenezer

Part 2 – Proposed reference tariff for coal services

2.1 Proposed West Moreton reference tariff

2.1.1 Queensland Rail's Proposed Coal Reference Tariff

As described in Part 3 of this Volume 2, Queensland Rail has undertaken a detailed building block assessment of the maximum revenue that it is entitled to earn, consistent with the pricing principles established in the 2015 DAU and based on the efficient costs of providing access in the West Moreton Network. However, due primarily to the changes in the volume outlook for the West Moreton Network (as discussed in Part 1), Queensland Rail's assessed ceiling price reflects a sharp increase from its 2013 DAU proposal – with the ceiling price now in the order of $34.92/'000gtk (1 July 2015 $s).

Queensland Rail has previously taken the view that the reference tariff should be set at the ceiling price, but that in the event that setting actual access charges consistent with this price would be likely to result in a material reduction in tonnage from what would otherwise be anticipated, then Queensland Rail would be prepared to consider alternate arrangements.[23] Queensland Rail is highly incentivised to seek out mutually beneficial arrangements, as the cost to Queensland Rail of volume reductions is very high.

In this context, and given the significant increase in the ceiling price assessed for the 2015 DAU, Queensland Rail has taken a commercial decision to propose a reference tariff which is lower than the ceiling price, and indeed lower than the reference tariff proposed for the 2013 DAU of $22.22/'000gtk which was set at the ceiling.

This currently proposed reference tariff is intended to apply to all coal services on the West Moreton Network, providing the QCA and customers with certainty about the tariffs that Queensland Rail will apply.

Queensland Rail therefore proposes that the 2015 DAU reference tariff will reflect the continued application of the current reference tariff of $19.14/'000gtk (1 July 2014 $s). The rationale for this approach is discussed in detail in PwC's report for Queensland Rail – Reference Tariff for the West Moreton Network (Appendix 1). Escalating the reference tariff to 1 July 2015 dollars will give a reference tariff of $19.41/'000gtk.

The proposed reference tariff is a continuation of the status quo tariff, which itself was previously assessed by the QCA as being reasonable for application in the West Moreton Network. Further, Queensland Rail is satisfied that there is apparent demand for capacity at this price. As discussed in Part 1, while demand on the West Moreton Network has fallen with the closure of the Wilkie Creek mine, Queensland Rail is confident in the longer term outlook for the coal industry. Importantly, there remains demand for the unused train paths, with Queensland Rail having received two current access applications for 42 additional paths on the West Moreton Network. The projects to which those applications relate are not sufficiently certain of proceeding to build the paths into the forecast.

[23] Queensland Rail (2014). Queensland Rail Submission - Response to the QCA's Consultation Paper on the West Moreton Reference Tariff, p.29.

Further, as Queensland Rail explained in its response to the QCA's 2014 Consultation Paper, although challenging market conditions and cost pressures did result in the Wilke Creek mine closure,[24] mine operating costs reflect a broad range of inputs, and Peabody's decision to close the mine is likely to have reflected a combination of factors.

No approach was made by Peabody or its above-rail haulage provider to indicate that an alternate tariff could have influenced its decision.

Queensland Rail emphasises that retaining existing volume and attracting new demand is critical in order to maintain the financial viability of the West Moreton Network. However, there is a commercial trade-off that must be made in terms of a decision to reduce the proposed reference tariff in an endeavour to make the network more attractive to customers and hence attract a higher level of demand. If the tariff reduction does not actually promote sufficient additional demand to offset the revenue foregone from applying a reduced tariff to existing volume, then there is no commercial justification for this tariff reduction. Further, in these circumstances there is no economic requirement for the tariff reduction, as the price remains within the cost based floor and ceiling prices. Rather, this tariff reduction would simply result in a transfer of value from Queensland Rail to users.

While customers will certainly argue that Queensland Rail's proposed reference tariff is too high and that it will jeopardise future volumes, this must be recognised as the commercial positioning that it is - clearly it will be to users' commercial benefit if the tariff is reduced and they will strongly argue that this is necessary, regardless of the actual sensitivity of their volume decisions to the access charge.

Fundamentally, the risk that Queensland Rail's proposed reference tariff is set too high to maintain existing volume and attract new volumes is rightly Queensland Rail's commercial risk. Queensland Rail is prepared to accept this commercial risk based on its proposed tariff, knowing that the consequence of the price being set too high is that it will not attract the volume that it requires. In the event that this proves to be the case, Queensland Rail will reconsider the level of its access charge.

In this environment, the QCA clearly has a role to ensure that Queensland Rail's proposed price is no greater than a properly determined ceiling price. However, it is appropriate for Queensland Rail to determine the extent of the reduction from the ceiling price as this decision is clearly subject to effective market forces. If Queensland Rail's reference tariff is too high, the market will respond by deferring or reducing demand.

Queensland Rail proposes to continue to maintain a QCA reviewed ceiling price to provide certainty to both the QCA and customers that its reference tariff does not exceed the price ceiling. As part of this process, Queensland Rail proposes to maintain an endorsed Regulatory Asset Base (RAB), to facilitate future reviews of the reference tariff.

2.1.2 Treatment of capacity expansions

One of the issues raised as a concern in the QCA's Draft Decision is the risk that the current reference tariff approach may distort Queensland Rail's incentives to expand capacity in the most efficient way. While Queensland Rail does not currently forecast any requirements for capacity

[24] Queensland Rail (2014). p.28.

expansion for the 2015 DAU regulatory period, it is acknowledged that there is the potential for increased volume towards the end of the regulatory period and some capacity expansion may be required if this occurs.

Therefore, Queensland Rail proposes to adopt the following methodology for incorporating the costs of capacity expansion (if they occur) into the West Moreton reference tariff:

- Separate AT1 and AT2 tariff components have been identified for the West Moreton and Metropolitan Networks;
- for the Metropolitan Network:
    - an Incremental RAB will be maintained for the Metropolitan Network, incorporating capacity expansion capex;
    - an Incremental capex capital charge will be derived to, over time, recover the Incremental RAB value – this will be charged in addition to the base Metropolitan Network AT2 tariff component;
    - to the extent that actual capacity expansion capex differs from forecast, this will be recorded in a capex carryover account for the Metropolitan Network and any over (or under) recovery will be reflected as a decrease (or increase) to the incremental capex capital charge applicable in the next regulatory period;
- for the West Moreton Network, incremental capacity expansion capex will be included in the West Moreton Network RAB. To the extent that actual West Moreton capex differs from forecast, this will be recorded in a capex carryover account for the West Moreton Network and any over (or under) recovery will be reflected as a decrease (or increase) to the MAR applicable in the next regulatory period.

In proposing this methodology, Queensland Rail has accepted the approach proposed in the QCA's Draft Decision for the treatment of capacity expansion capex in the Metropolitan Network tariff. By incorporating the costs of capacity expansion capex into the reference tariff in this manner, Queensland Rail ensures that it retains a clear incentive to invest in efficient capacity enhancements, and the separation of the two networks ensure that the pricing methodology does not cause any distortion of the incentive to identify the most efficient means of enhancing capacity.

2.2 Implementation of reference tariff

2.2.1 Tariff structure

Consistent with the approach historically adopted for the West Moreton reference tariff, Queensland Rail proposes to recover overall revenues through a broadly equal split of train path based charges and gross tonne kilometre (gtk) based charges.

Base Tariff

In order to implement discrete tariff components for the Metropolitan and West Moreton Networks as discussed above, Queensland Rail has separated the base $/path charge into a 'Metropolitan' and 'West Moreton' path charge. Ebenezer will continue to pay a base reference tariff of $19.41/'000gtk.

Incremental capacity charge – Metropolitan Network

As discussed above, an incremental capacity charge will be determined for the Metropolitan Network so as to recover incremental capacity expansion capex in that network. This will be applied in addition to the base reference tariff. Consistent with the QCA's Draft Decision recommendation, Queensland Rail proposes to levy the incremental capacity charge as an addition to the base $/path reference tariff component.

Queensland Rail proposes to adopt an opening value for the Metropolitan Network incremental RAB, based on the following projects:

Table 5 Metropolitan Network Incremental RAB Opening Value at 1 July 2015 ($m)

Project	Value (1 July 2015 $m)
Surat Basin Stage 2	[redacted]
Surat Basin Stage 3	[redacted]
Columboola	[redacted]
Total	**21.2**

Queensland Rail notes that including these projects in the Incremental RAB is consistent with the approach recommended by the QCA in its Draft Decision on Queensland Rail's 2013 DAU. This Incremental RAB will be rolled forward in accordance with standard regulatory processes, increasing with CPI and decreasing to reflect asset depreciation.

Queensland Rail has assessed the $/path incremental capital charge required to recover the Metropolitan Network Incremental RAB value using with the methodology and relevant parameters described in Part 3. This results in an incremental capacity charge of $230.50/path for the Metropolitan Region. Queensland Rail acknowledges that this will cause a slight increase in the total West Moreton reference tariff (compared to the current tariff). However, by including these projects in the Metropolitan Network Incremental RAB, Queensland Rail will commence the payment of rebates in relation to user funded investments.

Summary of proposed tariff structure

Application of this approach gives rise to the following proposed tariff structure as at 1 July 2015:

Table 6 Proposed Reference Tariff as at 1 July 2015

Loading Point	AT1 WM $/'000gtk	AT2 WM $/path	AT1 M $/'000gtk	AT2 M $/path		
				Base	Inc	Total
Jondaryan, Macalister and Columboola	9.71	3,259.66	9.71	1,337.82	230.50	1,568.33
Ebenezer	-	-	19.41	-	230.50	230.50

Mines located in the West Moreton Network (New Acland, Wilkie Creek and Cameby Downs) will pay the sum of all four reference tariff components. Mines located in the Metropolitan Network (Ebenezer) will only pay the tariff components relating to the Metropolitan Network.

2.2.2 Form of regulation and reference tariff review

The reference tariff will be applied as a price cap, consistent with current practice. This means that Queensland Rail will bear all costs and retain any benefits associated with actual volumes varying from forecast. As Queensland Rail is pricing below the ceiling, it is entirely reasonable that Queensland Rail captures the benefit of volume increases on the rail network (unless the volume increases are sufficient to cause the tariff to breach the ceiling revenue limit). In the context of Queensland Rail's decision to accept the commercial risk of whether the level of its proposed reference tariff is sufficient to attract volume, it is also appropriate that Queensland Rail bears any costs resulting from volume reductions. Through its acceptance of the volume risk on the West Moreton Network, Queensland Rail's incentives are highly aligned with those of its customers, in terms of having a very strong objective to facilitate maximum possible volumes of coal on its network.

Consistent with current practice, the reference tariff will escalate on an annual basis in accordance with CPI. Additional price reviews will apply in the event of endorsed variation events and review events as defined in the 2015 DAU.
This proposal is consistent with the approach proposed by Queensland Rail for the 2013 DAU which the QCA accepted in its 2014 Draft Decision.

2.2.3 Take or pay arrangements

Queensland Rail proposes to apply a take or pay obligation equal to 80% of the access charge. This reflects no change to the current take or pay arrangements for the West Moreton reference tariff.

Queensland Rail acknowledges that, in its 2014 Draft Decision, the QCA proposed some adjustment to the take or pay arrangements, so that Queensland Rail would only be entitled to recover take or pay on the West Moreton Network up to the amount required to lift its annual revenue to 100% of the target revenue used in developing the West Moreton reference tariffs.[25]

Queensland Rail has not implemented this proposal. As noted by the QCA,[26] take or pay is included in access agreements to achieve a number of outcomes, the most important of which are to support revenue certainty for the infrastructure provider and to encourage customers to accurately contract for the capacity that they require. Queensland Rail considers that the QCA's proposal undermines the effectiveness of the take or pay arrangements in achieving both of these objectives.

From a revenue certainty perspective, it is important that the QCA's consideration of take or pay arrangements explicitly acknowledges that Queensland Rail's proposed reference tariff has been set at a level below the price ceiling. Any assessment of target revenue based on applying Queensland Rail's proposed reference tariff to its forecast volume therefore bears no relationship to the ceiling revenue, and as a result there is no economic basis for restricting Queensland Rail from collecting revenue payable under the terms of its contracts.

Further, even with the take or pay arrangements as proposed in the 2015 DAU, Queensland Rail bears some uncertainty around its access revenue stream. It is not appropriate for the QCA to

[25] Queensland Competition Authority (2014b). section 3.4.
[26] Queensland Competition Authority (2014b). p. 46.

limit the application of take or pay in order to truncate Queensland Rail's revenue upside in the event that actual volumes exceed forecast, where take or pay will not necessarily be paid when actual volumes are less than forecast (noting in particular that Queensland Rail's volume forecast is significantly higher than its current contracted volumes).

Queensland Rail is also concerned that the application of network-wide take or pay caps may lessen the incentive for customers to accurately contract for their required capacity. If users' believe that their take or pay obligation will be reduced in the event that another user has demand for additional capacity, they may be more willing to take a risk on over-contracting in order to ensure that they have sufficient capacity to allow haulage of peak volumes. This has certainly proven to be the case in central Queensland, where take or pay system capping is applied, and over-contracting by customers occurs. Queensland Rail understands that, in Central Queensland, all stakeholders see the benefit of moving to an arrangement where users have an unambiguous obligation to pay take or pay on their unused contracted tonnages, with any collection of revenue exceeding the revenue ceiling returned to users in a non-distortionary manner.

2.2.4 Tariff application date

The proposed reference tariff will apply from the approval date of the 2015 DAU and will apply for the term of the 2015 DAU, which will continue until 30 June 2020.

Part 3 – Ceiling price for West Moreton Network coal services

3.1 Ceiling price for West Moreton Network coal services

Queensland Rail has developed the ceiling price for coal services on the West Moreton Network by considering the building block components applicable to all services operating on the route, and then allocating this between coal and non-coal services to derive a ceiling price specific to coal services on the West Moreton Network. This is consistent with the approach used for the 2013 DAU.

In summary, the Maximum Allowable Revenue (MAR) for coal services on the West Moreton Network is as follows:

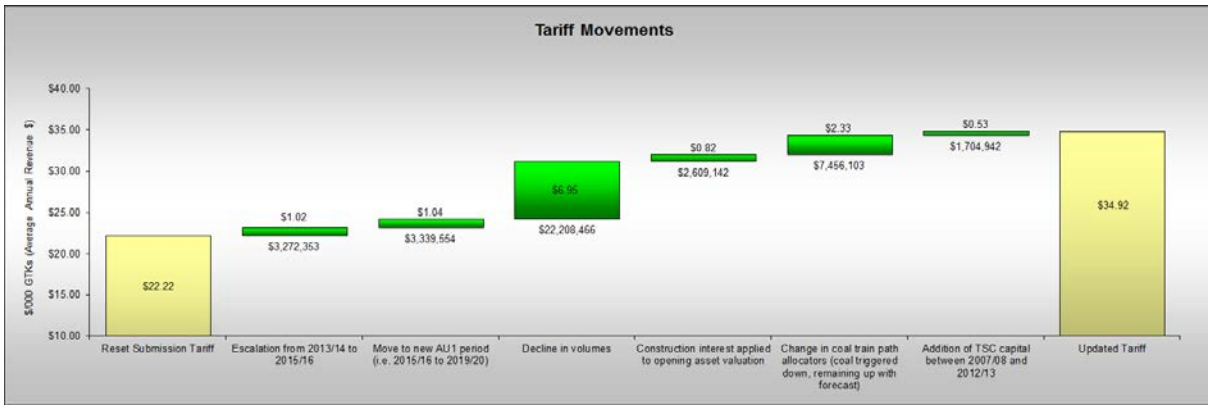
Table 7 Coal Services Maximum Allowable Revenue ($m, nominal)

	2015-16	2016-17	2017-18	2018-19	2019-20	NPV
Unsmoothed Revenue (Maximum Allowable Revenue)						
Return on Assets	25.4	26.4	27.5	28.6	29.5	
Add Depreciation	22.5	22.8	21.3	22.4	23.7	
Less Inflation	-9.2	-9.5	-9.9	-10.3	-10.6	
Add Maintenance Costs	40.7	22.2	29.4	22.9	26.5	
Add Other Operating Costs	6.9	7.1	7.3	7.5	7.7	
Post Tax Revenue (End Year $)	86.4	68.9	75.5	71.1	76.7	
Post Tax Revenue (Mid Year $)	84.5	67.3	73.8	69.4	74.9	304.9
Smoothed Revenue (Annual Allowable Revenue)						
Post Tax Revenue (Mid Year $)	72.6	71.5	74.6	75.5	77.9	304.9
Add Gamma Adjusted Tax	1.1	4.0	2.9	3.9	3.4	
Pre Tax Revenue (Mid Year $)	73.7	75.5	77.4	79.4	81.3	

Based on Queensland Rail's forecast volumes, as described in Part 1, this gives rise to a ceiling price of $34.92/'000gtk (1 July 2015 $s).

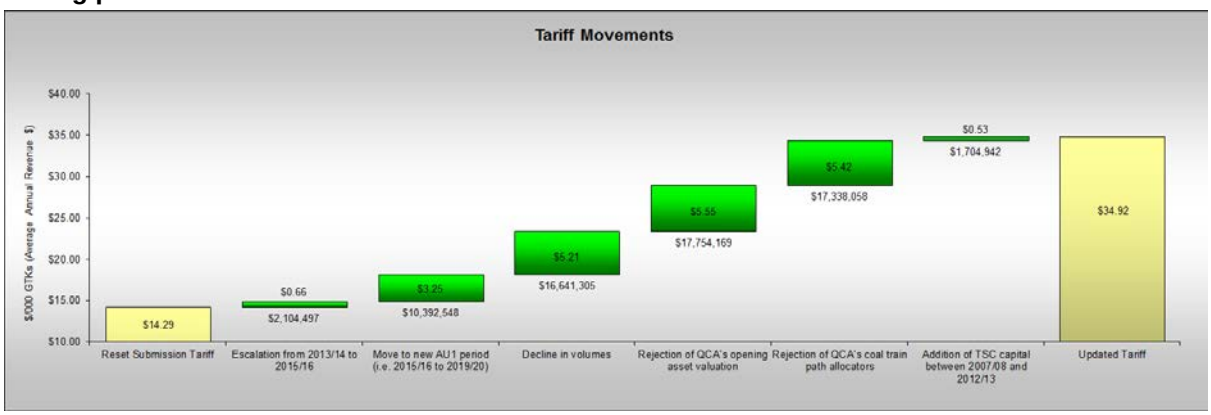
As noted in Part 2, this reflects a sharp increase from Queensland Rail's 2013 DAU proposal, where Queensland Rail assessed the ceiling price as $22.22/'000gtk (1 July 2013 $s). The primary cause of this increase is the changed volume outlook for the network. As can be seen from the waterfall chart below, excluding the impact of escalation, 61% of the increase is due directly to the decline in forecast coal volumes, while a further 20% of the increase relates to the changed allocation of costs between coal and non-coal services, which reflects the overall change in the market outlook for the network, as discussed in Part 1.

Figure 4 Movement in Coal Services Ceiling Price from 2013 DAU to 2015 DAU



Queensland Rail has prepared a similar waterfall diagram illustrating the major components causing Queensland Rail's assessed ceiling price to significantly exceed the reference tariff proposed by the QCA in its Draft Decision.

Figure 5 Movement from QCA's proposed reference tariff to Queensland Rail's assessed ceiling price



When compared with the reference tariff proposed by the QCA in the Draft Decision, it is clear that there are three major contributors to the increase from the QCA's proposed tariff of $14.29/'000gtk to Queensland Rail's assessed ceiling price, being:

- consistent with the factors contributing to the increase in Queensland Rail's assessed ceiling price, the decline in coal volumes causes a $5.21/'000gtk;
- Queensland Rail's rejection of the QCA's modified DORC asset valuation approach causes a further $5.55/'000gtk increase; and
- the adoption of a reasonable approach to allocation of costs between coal and non-coal services lifts the proposed tariff by an additional $5.42/'000gtk.

The adoption of new cost forecasts for the revised modelling period also results in an increase to the recommended tariff, but this is of lesser significance than the above factors.

Section 3.2 sets out Queensland Rail's forecast of the building block components for providing the West Moreton Network, focusing in particular on the reasons why Queensland Rail has rejected the QCA's modified DORC asset valuation approach. Allocation of these costs between coal and non-coal services, in particular highlighting the shortcomings of the QCA's proposed approach, is addressed in Section 3.3.

Queensland Rail will make available to the QCA its model for calculation of the ceiling price and an accompanying model review report prepared by PwC.

3.2 West Moreton Network building block components

3.2.1 Opening asset value

For any regulated infrastructure provider, the return on, and of, capital are the largest components of the MAR. This reflects the significant investments made in sunk network infrastructure that has no alternative use. The arrangements applicable to an infrastructure provider's recovery of its past sunk investment can also directly impact its incentives to undertake further investment in the network.

For the 2015 DAU, Queensland Rail has used the asset valuation developed for the QCA by Everything Infrastructure in 2008 (adjusted for some minor errors and exclusions of factors that weren't considered), and rolled this forward to 2015 in accordance with accepted regulatory process.

Queensland Rail recognises that the appropriate opening asset value has been a topic of intense debate throughout the assessment process of the 2013 DAU, and also through the process of developing the current access undertaking. Queensland Rail's proposal has been developed having regard to the various arguments and positions made in this debate, including the QCA's proposed value in its Draft Decision on the 2013 DAU. Importantly, however, Queensland Rail does not consider that the QCA's proposed asset valuation is reasonable, nor is it consistent with accepted regulatory practice in establishing an opening asset value that reflects the stand-alone cost of the service for the purpose of setting the ceiling price. Accepted regulatory practice is to establish that value based on a forward-looking DORC valuation. This view is supported by the accompanying report by PwC – Asset Valuation of the West Moreton Network (refer Appendix 2), and the reasons for Queensland Rail's position are set out below.

3.2.1.1 Queensland Rail's 2013 DAU proposal

In the 2013 DAU, Queensland Rail proposed a roll forward of the QCA's adopted Depreciated Optimised Replacement Cost (DORC) valuation from its 2010 Pricing Decision for the QR Network. That value reflected the recommendation made by the QCA's consultant, Everything Infrastructure.

Queensland Rail used Everything Infrastructure's asset valuation as at 1 August 2007, making the following adjustments:

- correcting an error made in the allocation of tunnels, where Everything Infrastructure had allocated tunnels in the Rosewood to Macalister section to the Macalister to Columboola section; and
- adding back in expenditure on the Western System Asset Replacement Project (formerly the Surat Basin Track Upgrade Stage 4 Project), which, for the reasons explained in Queensland Rail's submission on the 2013 DAU, the QCA inappropriately excluded.

Queensland Rail also included a valuation for the Macalister to Columboola route section, which was excluded from the reference tariffs approved in 2010. This valuation was determined based on Everything Infrastructure's assessment.

Queensland Rail rolled this valuation forward in a manner consistent with accepted regulatory practice. The valuation only included capex that Queensland Rail considered was triggered by coal services to arrive at its proposed common network value of $419.6m.

3.2.1.2 QCA's response

June 2014 Consultation Paper

As part of its review of the 2013 DAU, the QCA commissioned a review of its previously approved DORC value. This review was undertaken by B&H. This assessment accepted key aspects of Everything Infrastructure's valuation, including the quantity and replacement cost of assets, and focussed on reviewing two key issues, being the estimated expired life of an asset compared with its economic life and the condition of the assets. While Queensland Rail has concerns with some aspects of its methodology, B&H arrived at a valuation that was within 2% of the value that Queensland Rail had proposed in its 2013 DAU.

The QCA took the view that:[27]

> *While Queensland Rail should be expected to earn a reasonable return on its efficient costs, the QCA recognises that western system miners face intense cost pressures at a time of low coal prices – e.g. one of the three mines on the western system has already closed.*

It therefore presented two alternative tariff proposals that reflected different asset valuation approaches, being an:

- asset allocation approach based on a DORC methodology (and similar to 2009 Draft Decision); and
- historic cost approach.

QCA's 2014 Draft Decision

The QCA stated that it was 'persuaded to reconsider the opening value of the western system assets' in light of the failure to agree on a value in previous determinations and more recent stakeholder submissions.[28] It indicated that 'new information and arguments' had been presented by Queensland Rail and other stakeholders.

The QCA considered that having regard to the age and condition of certain assets, neither the historical cost approach nor DORC (applied in accordance with its Consultation Paper) would result in an outcome that is consistent with the pricing principles in the QCA Act. It therefore proposed a modified approach to the DORC valuation, which placed a zero value on certain assets. One of the 'principles' that underpinned this was that life expired assets should be excluded from the initial asset base as this would result in 'double recovery' of the investment. It stated:[29]

---

[27] Queensland Competition Authority (2014a). p.iii.
[28] Queensland Competition Authority (2014b). p.129.
[29] Queensland Competition Authority (2014b). p.138.

> *…if an asset's actual life exceeds its expected useful life it can be reasonably anticipated that it has been fully depreciated. It should not then be revalued and included in the RAB again for the investment to be recovered a second time. It follows that a life expired asset should not be included in the initial asset base, as this would also be double recovery of the investment.*

B&H was instructed to prepare a revised asset value on this basis, which resulted in a reduction to the value of 42%, moving away from B&H's earlier independent advice.

3.2.1.3 Purpose of the DORC valuation

Queensland Rail considers that it is important to review this debate in the context of the purpose of the DORC valuation, which is to establish a ceiling price for services operating on the West Moreton Network.

The rail industry is characterised by high fixed costs and economies of scale, exhibiting properties of a natural monopoly. A natural monopoly is a market in which it is most efficient for a service to be provided by a single supplier. The regulation of such markets prevents the incumbent in the market from exploiting monopoly power.

In the regulation of access to rail infrastructure, the price an entity may charge for a regulated service is constrained by a price ceiling, which reflects the stand-alone cost of providing that service.[30] The price ceiling is intended to replicate the outcome that would occur in a competitive market and thus protect customers against monopoly pricing.

The stand-alone cost is the maximum efficient price which can be charged by the access provider without inducing inefficient bypass of the service or entry to the market. Any price above the stand-alone cost would – in a competitive market – provide incentives for new firms to enter the market. For example, it may induce a new entrant to construct a duplicate rail network and operate an alternative service, resulting in economic loss due to the economies of scale present in natural monopolies.

The QCA has previously characterised stand-alone cost as:[31]

> *The theory underpinning the stand-alone cost approach is that this is the maximum amount that a below-rail service provider could charge in a competitive market. In theory, if Queensland Rail sought to recover more than the (efficient) stand-alone cost of the below-rail services it provides, a hypothetical competitor would have an incentive to duplicate Queensland Rail's network and offer a lower price to Queensland Rail's existing customers. Whilst such an outcome is most unlikely in practice, the approach provides a theoretical cap that can be applied for the purpose of regulating Queensland Rail's access charges (that is, its reference tariffs).*

The concept of stand-alone cost is therefore a hypothetical construct based on the cost faced by a new entrant. This is used for the purpose of setting the ceiling price. The actual tariff charged

[30] Note, the approach proposed by Queensland Rail reflects the stand alone cost of all services on the West Moreton Network, but allocates costs between coal and non-coal services to arrive at the ceiling price for coal services.
[31] Queensland Competition Authority (2001). Final Decision on Queensland Rail's Draft Undertaking, p.349.

could be at or below this ceiling, provided it is not below the incremental costs of providing the service to a particular user.

In Australia, the standard approach to establishing the opening regulated asset value is based on DORC.[32] Importantly, the assessment of DORC is forward looking, reflecting the objective of the ceiling price, which is to prevent incentives being created for inefficient network bypass. At the same time, Australian regulators have taken a pragmatic approach to the application of this principle, noting that the majority of assets subject to regulation in Australia were initially valued on a brownfields basis. Reference is made to the accompanying report by PwC, which further considers the purpose and application of DORC.

3.2.1.4 Concerns with the QCA's approach

The purpose and application of DORC

In Queensland Rail's view, the purpose of the valuation has been lost in this debate, as evidenced by the QCA's Draft Decision. The focus has shifted to the actual value of the asset and the actual price that should be charged for that asset. While the actual reference tariff that will apply clearly needs to be determined, the first task is to establish an opening asset value for the purpose of setting the ceiling price. This is based on a forward-looking DORC valuation. The determination of the actual reference tariff that will apply in the next period is a subsequent step in that process, which, as was discussed in Part 2, is influenced by a number of additional considerations.

This loss of focus on the purpose of the DORC valuation and the concept of stand-alone cost has resulted in the QCA taking a backward rather than forward-looking approach in establishing the DORC. It has sought to rationalise the adoption of an approach that is unique to Australian regulatory practice based on the age and condition of the assets. This is fundamentally inconsistent with the purpose of the DORC valuation.

The QCA has previously cited regulatory certainty as being one of the key issues for users of the network.[33] This is equally important to Queensland Rail, as it seeks to recover sunk investments made in the network and is expected to continue to invest in the network in order to provide services to coal and non-coal users.

It is recognised that there have been a number of issues raised regarding the application of the DORC approach in the context of the West Moreton Network, including the valuation adopted in 2009, however, these issues were minor in the context of the overall valuation. At that point in time Queensland Rail did not contemplate that the QCA would fundamentally modify the DORC approach to become essentially a backward-looking valuation. It certainly never contemplated that this change in approach could reduce the valuation by 42%.

The QCA suggests that 'new information and arguments' have come to light that have persuaded it to revise its valuation. Much of this information and arguments relate to the age and condition of the assets. Issues regarding the age and condition of the assets in the West Moreton Network are well known.

[32] There are some exceptions to this, as noted in PwC's report.

[33] Queensland Competition Authority (2009). Draft Decision, Queensland Rail Network 2009 Draft Access Undertaking.

Importantly, the original B&H valuation conducted in 2014 reflected all of the information that is currently known about asset condition. In fact, a review of the estimated expired life of the assets compared with their economic life and the condition of the assets was the key focus of this review. As noted above, having regard to all available information on asset age and condition, B&H's assessment was within 2% of Queensland Rail's proposed valuation. Indeed, multiple independent reviews have all arrived at a similar value, including the original valuation undertaken for QR Network by Connell Hatch, Everything Infrastructure's 2008 review for the QCA, and B&H's original review in 2014. The QCA is now proposing a value that is 42% lower, on the basis that it has advised its consultant to adopt 'non-standard' assumptions in the DORC assessment. B&H made it clear that its most recent valuation was modified to reflect the instructions it had been given by the QCA regarding asset lives.

It is also important to recognise that the standard DORC valuation approach is routinely used to value assets of varying age and condition. While the DORC value is based on the replacement cost of the modern engineering equivalent asset, this value is adjusted by depreciating it to reflect the remaining service potential of the existing asset, given its age and condition. Therefore, if a new asset would be expected to have a life of 50 years, and the existing asset is assessed to have a remaining life of five years, then the asset value will be depreciated by 90% to reflect assumed depreciation over 45 years. Indeed, the QCA itself recognised this in its 2009 Draft Decision stating that:[34]

> *All these factors, including the age and condition of the track and other infrastructure, are taken into account in the DORC valuation, which is taken into account when assessing prices.*

Queensland Rail reiterates that regardless of the age and condition of the assets, the application of standard regulatory principles requires a forward-looking DORC valuation for the purpose of establishing a ceiling price.

Other issues

Apart from the fact that the QCA's approach is in contrast to the standard regulatory approach of applying a forward-looking DORC for the purpose of establishing the ceiling price, Queensland Rail has a number of other concerns, which are discussed in detail in PwC's attached report (Appendix 2).

First, one of the issues stated by the QCA as driving its reconsideration of the opening asset value is the intense cost pressures faced by miners in the West Moreton Network. Queensland Rail acknowledges the significance of this issue, as evidenced by the closure of the Wilkie Creek mine. However, as prices recover, which invariably occurs in what is an inherently cyclical market, these cost pressures will alleviate. More importantly, as noted by PwC, this 'should not influence the way in which the primary valuation is constructed.'[35] Affordability should not determine where the ceiling price is set.

Second, one of the principles cited by the QCA as underpinning its modified approach is that Queensland Rail should not be able to 'double recover' a return on and of capital for assets that are life expired. This makes an important presumption, which is that Queensland Rail has fully recovered the return on and of capital for these assets.

---

[34] Queensland Competition Authority (2009). p.75.

[35] PwC (2015). p.ix.

The QCA provides no information or evidence to support this presumption, noting that this would be extremely difficult to assess with any confidence. Queensland Rail considers that this is an adverse and doubtful presumption to make in this context, particularly given the historical use of the network by non-coal services which, as is well known, have always had limited capacity to pay. The PwC report concludes that:[36]

> *Key to the QCA's exclusion of certain assets from the DORC valuation is an implied claim that these fully-depreciated assets have already been paid for by users. If the regulator's concern is about double charging, then it needs to be evidenced with an analysis of whether past depreciated expenses were actually recovered from past users.*

Third, the QCA has not properly considered the effect of excluding assets from prices (as required under s.138(2) of the QCA Act), as valuing assets at zero, even where they have remaining service potential is the same as excluding them for pricing purposes. This highlights that the QCA's approach is not forward-looking, which would have regard to the remaining service potential of the assets.

Queensland Rail considers that it is beyond doubt that there is significant remaining service potential in the assets that the QCA has assessed as life expired. Not only are they continuing to be used to provide a safe network for operators, but the QCA's consultant, B&H, has undertaken a detailed analysis of the remaining useful life of the assets in forming its original valuation.

Queensland Rail further considers that, even if the QCA's approach of treating assets as life expired following the expiration of their nominal life were reasonable, the QCA has misapplied this approach in its assessment of depreciation for Queensland Rail's assets, resulting in treatment of many assets as life expired, notwithstanding that they have been renewed since their original construction. There is a clear difference between assets that are installed and then able to be maintained, theoretically in perpetuity (e.g. a port channel) and assets that are installed and periodically renewed (e.g. rail, sleepers, ballast).

The QCA's approach treats most past asset renewal activities as maintenance, even where this asset renewal has resulted in higher standard assets being installed (e.g. the replacement of timber sleepers with steel sleepers). It therefore assumes that certain assets are now life expired, even where they have been periodically renewed, with the renewed assets still part way through their typically expected life (e.g. timber and steel sleepers). This contrasts with its position taken in 2005 for the Dalrymple Bay Coal Terminal, for example, which directly linked the definition of 'capital' (as opposed to 'maintenance') to expenditure that extended original useful asset lives:[37]

> *This definition delineates standard maintenance practices (including cyclical maintenance activities), which do not extend original, useful asset lives, from more significant (capital) improvements to assets that do extend original, useful asset lives.*

Given the extent of renewal works that have been undertaken on Queensland Rail's key assets, most particularly its track, signals and telecommunications assets, and given that this renewal work has in many cases improved the standard of the asset from that originally constructed, there is no reasonable basis for the QCA's view that these assets are life expired, simply because of the time that has elapsed since the construction of the original version of the assets.

---

[36] PwC (2015). p.ii.

[37] Queensland Competition Authority (2004). Draft Decision, Dalrymple Bay Coal Terminal's Draft Access Undertaking, p.204.

In conclusion, Queensland Rail does not consider that the QCA's proposed asset valuation is reasonable, nor is it consistent with accepted regulatory practice in establishing an opening asset value that reflects the stand-alone cost of the service for the purpose of setting the ceiling price. Accepted regulatory practice is to establish that value based on a forward-looking DORC valuation.

3.2.1.5 Queensland Rail's 2015 DAU proposal

Opening asset value at July 2013

Queensland Rail's proposed asset value (as at 2013) reflects its 2013 DAU proposal, except that:

- Queensland Rail has adjusted the 2013 asset value so that the roll forward includes all common network capex (rather than just the capex that was triggered by coal), which causes an additional $17.9m of capex to be included in the 2013 asset value. This has been done so that Queensland Rail can adopt the QCA's proposed approach that all capex should be included in the asset value, but that the resulting value should be allocated between coal and non-coal services based on forecast usage (refer section 3.3); and
- Queensland Rail has included Interest During Construction (IDC) on the opening asset value of $27.9 million.

The inclusion of IDC in the opening asset value is accepted regulatory practice and has been allowed for in the establishment of the RAB for the Central Queensland Coal Network[38] and DBCT[39]. It is also common practice in other regulated industries. This approach has also been recommended by PwC in its report provided as part of Queensland Rail's response to the QCA's 2014 Consultation Paper.

IDC was not included in derivation of Everything Infrastructure's 2008 valuation that has been rolled forward by Queensland Rail. This issue was raised in Queensland Rail's response to the QCA's Consultation Paper[40]. Queensland Rail acknowledges that the QCA has already accepted this position, noting that it instructed B&H to consider IDC as part of its revised valuation prepared for the Draft Decision. B&H included IDC at the WACC for the pre-2007 assets, because post-2007 assets already include IDC.[41]
Queensland Rail's proposed value for the common network for 2015 DAU as at 1 July 2013 is $463.6m. In addition, there is $16.0m in coal specific assets to give rise to a total opening asset value of $479.7m.

Roll forward to July 2015

Given that the 2015 DAU applies to the regulatory term commencing 1 July 2015, it is necessary to roll the proposed 1 July 2013 asset value forward to 1 July 2015. This has been done in accordance with accepted regulatory practice.

[38] Queensland Competition Authority (1999). Final Decision, QR's Draft Undertaking, Chapter 13.
[39] Queensland Competition Authority (2005). Final Decision, Dalrymple Bay Coal Terminal Draft Access Undertaking, April.
[40] Queensland Rail (2014). Submission on the QCA's Consultation Paper on the West Moreton Reference Tariffs, 18 July. p10.
[41] B&H (2014). Supplementary Report, Review of the Queensland Rail (QR) West Moreton System, Depreciated Optimised Replacement Cost (DORC) Using the Timeline of Expenditure, September, p.10.

This includes:

- actual inflation, except for the year ended 30 June 2015 where 2.5% has been assumed, reflecting the actual movement in CPI (All Groups – Brisbane) for the relevant period;
- expected actual capex between 1 July 2013 and 1 July 2015;
- depreciation, based on Queensland Rail's assumed asset lives (refer below).

Queensland Rail's actual capex between 1 July 2013 and 1 July 2015 (including expected actual expenditure to the end of this financial year) totals $39.3 million. Details on the specific projects that make up this expenditure are provided in Appendix 3 – 2015 DAU West Moreton Reference Tariff Capital Submission.

As shown in the table below, notwithstanding some timing differences, this total capex is within 5% of that proposed in Queensland Rail's 2013 DAU, which the QCA confirmed as reasonable in its Draft Decision.

Table 8 Capital expenditure ($m, nominal)

	2013-14	2014-15
2013 DAU Forecast	21.8	19.3
Queensland Rail Actual / Expected Actual	13.9	25.4

Accordingly, the roll-forward of Queensland Rail's 2013 asset value for the West Moreton Network to 1 July 2015 is shown in the following table.

Table 9 Proposed roll forward of West Moreton Network opening asset value ($m, nominal)

	2013-14	2014-15
Opening value	479.7	480.1
Add capex	13.9	25.4
Less inflation	15.7	12.3
Less depreciation	29.0	30.3
Closing value	480.1	487.5

3.2.2 Forecast capex

Consistent with the 2013 DAU, Queensland Rail proposes to include a forecast of capex in the building block assessment, with the prudent and efficient actual capex to be included in the RAB on an ex post basis. Queensland Rail has therefore assumed the proposals put forward and accepted by the QCA in its Draft Decision under the capital indicator process will remain, noting some issues were raised in relation to the prudency assessment process. Queensland Rail's response to these issues is contained in Volume 1.

In its Draft Decision, the QCA accepted that Queensland Rail's then proposed capex program was reasonable, given the age and condition of the assets. However, the QCA and its consultants suggested Queensland Rail needed to adopt a more strategic approach to capital projects, and conduct options analysis as part of the project evaluation process. Queensland Rail agrees with these comments, and subsequent to the 2013 DAU process, Queensland Rail has

developed its Asset Management Plan (provided as Appendix 6 to this submission), which provides the strategic framework for planning capital and maintenance activities. As suggested by the QCA, Queensland Rail has incorporated options analysis, where technically feasible alternatives exist, as part of the development of its capital program. These issues are discussed further in Appendix 3 – 2015 DAU West Moreton Reference Tariff Capital Submission.

Queensland Rail has developed a capital program for the West Moreton Network consistent with its Asset Management Plan, which sets out its forecast capex over the next five years. Proposed projects over the five year regulatory period total $141.9m, including capitalised interest of $4.8m. The table below provides a summary for each project. These are the total costs for all common network assets, before allocation between coal and non-coal services. The allocation of capex is discussed in Section 3.3.

Table 10 Forecast capex ($m, nominal)

	Project Name (Expenditure with Construction Interest in $Nominal)	15/16 ($m)	16/17 ($m)	17/18 ($m)	18/19 ($m)	19/20 ($m)	Total ($m)
1	Slope Stabilisation on Toowoomba Range	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	8.742
2	Formation Repairs	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	17.638
3	Timber and Steel Bridge Elimination	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	36.409
4	Replace Timber and Steel Bridges with Reinforced Concrete Box Culverts	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	2.419
5	(New) Drain Renewals	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	8.386
6	Check Rails Curves	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	17.311
7	Relay/Recondition Program	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	15.330
8	Rerailing Program Rosewood to Oakey	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	9.743
9	Steel Bridge Strengthening	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	2.152
10	Level Crossing Reconditioning	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	1.900
11	Level Crossing Compliance Program	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	4.390
12	Pedestrian Crossing Upgrade Program	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	4.547
13	Siemens AZS 600 Axle Counter Replacement Rosewood -Toowoomba	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	1.725
14	ATP Network System Upgrades	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0.592
15	Corridor and Asset Protection	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	3.076
16	Digital Telemetry Rollout – West Moreton	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	1.182
17	DTC Automatic Code Exchange	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0.503
18	Remote Monitoring System Upgrades	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0.598
19	Signalling Pole Route Upgrade Grandchester to Laidley	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0.934
20	Upgrade of 4.5V Solar Track Feed to 12V Helidon to Lockyer (3), Forest Hill to Laidley (3	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0.460
21	Upgrade of Model 10 Boom Mech	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0.363
22	Upgrade Alternators Grandchester, Yarongmalu, Rangeview	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0.544
23	Upgrade Asbestoses Loc Boxes	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0.562
24	Train Radio Network Replacement Project	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	2.287
25	Backbone Strategy	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0.074
	Total	**26.945**	**30.807**	**31.600**	**27.116**	**25.399**	**141.867**

For simplicity, it is assumed that all of the individual projects (including individual projects that are part of a larger program of works) will be completed within a single year, and as a result forecast expenditure is capitalised in the year it is spent.
The table below compares the total program to that previously forecast for the 2013 DAU, and which was accepted by QCA in its Draft Decision.

Table 11 Capital expenditure ($m, nominal)

	2015-16	2016-17	2017-18	2018-19	2019-20
2013 DAU (accepted by QCA)	20.1	20.5	NA	NA	NA
2015 DAU (proposed)	26.9	30.8	31.6	27.1	25.4

As indicated above, the forecast for 2015-16 and 2016-17 is around $17m higher than the proposals accepted by the QCA in its draft decision for those years (noting in aggregate the first two years are broadly the same). The main contributing factors to the increase in the final two years are:

- an acceleration of the timber bridge replacement program (around $9m) and the check rail curves program (around $2.2m);
- provision for steel bridge strengthening which was not in the original program is it was an unknown issue at the time (around $2.1m); and
- the corridor and asset protection project which was deferred from earlier years (which contributed to 2013-15 actual capex being $1.8m lower than forecast), and costs have increased from previous estimates (around $2.5m).

The balance of the increases are from changes to the scope of the program based on better information.

Queensland Rail notes that there may be some expectation that volume reductions on the West Moreton Network may create the opportunity to defer some capex projects, and hence reduce the forecast capital program. However, rail infrastructure assets are long life assets, and the capital program is primarily aimed at replacing assets as required in order to maintain the integrity of the rail network – that is, replacing assets that have reached the end of their useful life. Reductions in the usage of the infrastructure, particularly where the reduction is relatively modest or over a short time frame, is unlikely to significantly extend the life of these assets. In this context, deferral of Queensland Rail's capital program would most likely lead to an erosion in service standards.

Further, as noted in Part 1, there is opportunity for coal volumes to recover in the future. Queensland Rail does not consider it appropriate to allow the network standards to deteriorate in response to a potentially short term reduction in volume, as the deteriorated state may inhibit future opportunities for traffic volumes to increase.

3.2.3 Depreciation charge

Consistent with the 2013 DAU, Queensland Rail has applied straight line depreciation based on its assumed asset lives, as follows:

Table 12 Asset lives

Asset Lives	Years
Track (inc Turnouts)	35
Roads	38
Fences	20
Signals	20
Bridges	50
Tunnels	100
Culverts	50
Earthworks	100
Land acquisition costs	50

Asset Lives	Years
Telecommunications	20
Power systems	20
Other	20

Consistent with Queensland Rail's previous approach, land is not depreciated.

This aligns reasonably closely with the standard asset lives recommended by the QCA's consultant, B&H. The only difference is that B&H recommended a standard life of 100 years for bridges and culverts. In Queensland Rail's experience, 50 years reflects a more likely standard life for bridge and culvert assets.

3.2.4 Forecast asset value roll-forward

Based on the parameters above, the forecast West Moreton Network asset value, rolled forward for each year of the regulatory period, is as follows.

Table 13 Proposed roll forward of West Moreton Network asset value ($m, nominal)

	2015-16 (forecast)	2016-17 (forecast)	2017-18 (forecast)	2018-19 (forecast)	2019-20 (forecast)
Opening value	487.5	495.3	507.1	522.4	532.4
Add capex	26.9	30.8	31.6	27.1	25.4
Less inflation	12.5	12.8	13.1	13.4	13.6
Less depreciation	31.7	31.8	29.3	30.6	32.1
Closing value	495.3	507.1	522.4	532.4	539.4

3.2.5 Return on assets

Queensland Rail's proposed WACC for the 2015 DAU is summarised in the table below.

Table 14 Proposed WACC

Parameter	Queensland Rail 2015 DAU Proposal
Credit rating	BBB+
Risk free rate	2.81%
Market risk premium	6.5%
Asset beta	0.45
Gearing	55%
Equity Beta	0.80
Gamma	0.47
Equity margin	5.20%
Cost of Equity	8.01%
Debt Margin	3.24%
Cost of Debt	6.05%

Parameter	Queensland Rail 2015 DAU Proposal
WACC Margin	4.12%
WACC	**6.93%**

This proposal is consistent with the QCA's recommendation in its Draft Decision on Queensland Rail's 2013 DAU.

However, in proposing this WACC, Queensland Rail notes that, in its June 2014 Consultation Paper the QCA noted the similarities between the risk profile of the West Moreton Network and the Central Queensland Coal Region (CQCR), while highlighting some differences, including:

- the basis for tariffs - Queensland Rail is subject to a price cap rather than a revenue cap;
- service diversification – the West Moreton Network carries more non-coal freight, which is not able to pay the ceiling price and is subject to a subsidy from the Queensland Government (via the Transport Services Contract);
- sources of revenue – the West Moreton Network currently serves only two coal mines, compared to around 50 in the CQCR;
- differences in coal products and market impacts – the West Moreton Network serves low margin thermal coals, compared to predominantly higher margin coking coals in the CQCR.[42]

In its 2014 Draft Decision the QCA reiterated the above differences between Queensland Rail and Aurizon Network, which suggested to it that Queensland Rail's risk profile is 'unlikely to be less than those faced by Aurizon Network.'[43] Queensland Rail submits that this evidence suggests that not only can Queensland Rail's risk profile not be less than that faced by Aurizon Network, if anything Queensland Rail's risk profile is likely to be higher. The QCA noted the detailed review that it has conducted of Aurizon Network's risk profile, where it has proposed to apply an equity beta of 0.8 (and the same gearing level).

Notwithstanding that Aurizon Network's risk profile is lower than Queensland Rail's, in its Draft Decision, the QCA proposed WACC parameters for Queensland Rail which directly aligned to its recommendations for Aurizon Network. Co-incidentally, the recommended WACC was the same as that initially proposed by Queensland Rail, albeit with changes made to a number of parameters, including a number that resulted from the QCA's cross industry WACC review, completed in 2014.

While Queensland Rail is proposing to apply the WACC as suggested by the QCA in its Draft Decision, we note that the QCA's assessment of beta is directly linked to its assessment of the beta to apply to Aurizon Network. Queensland Rail is currently assuming that this assessment will remain unchanged between the Draft and Final Decision for Aurizon Network. To the extent that:

- the QCA changes its assessment for Aurizon Network, for example on the basis of arguments submitted by stakeholders; and
- this is expected to result in it changing its position for Queensland Rail,

[42] Queensland Competition Authority (2014a). p.21.

[43] Queensland Competition Authority (2014b). Draft Decision, Queensland Rail's 2013 Draft Access Undertaking, October, p.142.

then Queensland Rail should have the opportunity to respond to any such change in position, having regard to the reasons for the proposed change in the context of the circumstances of the West Moreton Network.

Consistent with accepted regulatory practice, Queensland Rail proposes to agree confidential averaging periods with the QCA in setting the risk free rate and debt margin, and hence the final WACC, to apply for the purpose of the final tariffs.

3.2.6 Maintenance costs

Queensland Rail has forecast maintenance costs for the 2015-16 to 2019-20 period. As noted previously, Queensland Rail has recently developed an Asset Management Plan for the West Moreton Network to provide a strategic framework for decisions, including the maintenance program. The plan considers the current and future demand environment, service requirements and asset capacity and condition. Capital investment and maintenance strategies are then developed within this context. These strategies also form the basis of maintenance scope and cost.

The table below provides an overview, by product type.

Table 15 Forecast maintenance costs ($m, nominal)

West Moreton Maintenance	2015/16	2016/17	2017/18	2018/19	2019/20	Total
Track (excl. Mech Resleepering)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	87.803
Mechanised Resleepering	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	16.987
Structures	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	20.372
Trackside Systems	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	11.177
Other	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	6.624
SUB TOTAL (incl. Mech Resleepering)	**41.102**	**22.396**	**29.628**	**23.111**	**26.728**	**142.964**
SUB TOTAL (excl. Mech Resleepering)	**24.114**	**22.396**	**29.628**	**23.111**	**26.728**	**125.976**

More detailed information is provided in Appendix 4 – West Moreton Reference Tariff Maintenance Submission - 2015 DAU. It should be noted that no provision for derailments or flooding events has been made in these forecasts. Should a significant event occur, Queensland Rail may either submit a request for reference tariff variation due to a review event or request a one off contribution from end-users.

Mechanised resleepering

As indicated in the table above, the reduction in maintenance costs from 2015/16 to 2016/17 is largely due to the inclusion of a large resleepering expenditure in 2015/16. This is the largest individual cost item in the maintenance program, the need for which was accepted by the QCA and its consultant (Appendix 4 provides more information about the program need and scope).

In its 2013 DAU, Queensland Rail proposed resleepering costs of $[redacted]m, to be carried out in 2015-16 ($[redacted]m) and 2016-17 ($[redacted]m), based on $[redacted] per sleeper. In its June 2014 Consultation Paper, the QCA reduced this allowance to $13.9m, based on a lower unit rate of $200 per sleeper. While the QCA's consultant did not provide any detailed information on how it had formed the view that $200 per sleeper was reasonable, it did indicate that this was

considered to be more in line with the mechanised resleepering costs incurred elsewhere in Australia.

Based on this feedback, Queensland Rail conducted a detailed review of resleepering costs, particularly in the context of the West Moreton Network. As a result of this review, Queensland Rail disputed the QCA's proposed rate, but revised its rate to $[redacted] per sleeper. The QCA did not vary from its recommended rate of $200 per sleeper in its Draft Decision, except to escalate it to the equivalent nominal dollar terms.

For the 2015 DAU, Queensland Rail has maintained its proposed cost of $[redacted] per sleeper as it believes this rate is correct and justified notwithstanding the QCA's views. The cost is built up from the following:

- purchase and freight delivery/distribution of materials;
- project management;
- purchase and installation of DSS plates for [redacted]% of sleepers (each plate costs $[redacted], so an equivalent unit rate across all sleepers is $[redacted] per sleeper ([redacted]% of $[redacted])). These plates are required due to the standard and formation of the West Moreton track. Notably, these costs would not typically be incurred by the comparator railways, and therefore would not have been included in the $200 per sleeper allowance assessed by the QCA's consultant;
- full resurfacing;
- track protection officers included in the labour unit price;
- an allowance of 5% for cost risk.

Appendix 4 provides a detailed breakdown of the unit rate, by item.

By comparison, Queensland Rail's costs for resleepering in the Central Western system (located in central Queensland) are $[redacted] per sleeper, based on work in 2013 year (or $[redacted] per sleeper in $2015-16). There are additional costs involved for the West Moreton Network, namely:

- the addition of plates required given the different standard of formation and traffic requirements. As indicated above, the average unit cost (per sleeper) for plates in West Moreton is $[redacted]; and
- shorter track possessions, which means more stop-starts leading to more labour time spent doing set up and demobilisation, along with more machine down-time during this period. This in turn affects productivity (that is, less sleepers per hour).

Based on the above, comparable unit rates for the Central Western system and analysis done by the QCA's consultant, including the cost of DSS plates, are:

- QCA's consultant - $268 per sleeper ($200 per sleeper escalated to current nominal $ terms plus allowance for DSS plates at $52 per sleeper)
- Central Western comparable costs – more than $[redacted] per sleeper, using the actual rates (indexed to 2015/16), plus DSS plates.

As set out above, Queensland Rail proposed to maintain its previously proposed rate of $[redacted] per sleeper, in 1 July 2014 $s. This translates to $[redacted] per sleeper in 1 July 2015 $s, below the actual (with DSS plates equivalent) rates in the Central Western System which provides the best, contemporary evidence of the unit costs.

The total maintenance costs for resleepering are also lower due to a reduced scope of works. The reduce scope has arisen as the sleepers are in better condition than originally anticipated.

As such, the detailed assessment of sleepers has identified a lesser number of sleepers requiring replacement than originally forecast.

The combined effect of both the reduced scope and unit cost results in a forecast maintenance cost of $[redacted]m, compared to the $[redacted]m originally proposed under the 2013 DAU.

Other maintenance costs

The residual maintenance costs (without resleepering) are above the maintenance costs approved in the draft decision (refer below).

Table 16 Maintenance costs, excluding resleepering ($m, nominal)

Source	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
QCA Draft Decision (excluding resleepering)	20.7	19.5	20.6	19.8	NA	NA	NA
Queensland Rail Actual / Forecast (excluding resleepering)	19.0	20.0	24.1	22.4	29.6	23.1	26.7

Queensland Rail's accounting practices and systems mean that 2014/15 year costs are not verified until the close of the financial year.

The main contributors to the increase in other costs in 2015-16 and 2016-17 are:

- provision for asset management costs such as inventory management, technical advice and project management. These costs were not included in the 2013 DAU, and total around $1.2m per annum;
- additional provisions for rail renewal (around $0.9m in 2015-16 and $1.0m in 2016-17); and
- additional allowances for rail management (stress, joints, welds) product, attributable to increasing scope for rail stress measurement, replacement of rail defects found through ultrasonic testing, and welding (around $1.3m in 2015-16).

Queensland Rail has also analysed its maintenance program amidst the forecast decline in demand, and Appendix 4 includes a discussion on the way in which each maintenance product will vary with changed volumes. However, the downward variation associated with the current reduced volume outlook has been outweighed by the factors contributing to an increase in maintenance costs, discussed above.

3.2.7 Operating costs

Queensland Rail has forecast its operating costs using a base year of 2012-13, but with an adjustment to train control costs, which were reduced from $2.8m to $2.0m, based on the QCA's proposal in its Draft Decision.

Queensland Rail has considered realigning its forecast operating costs to reflect its 2013-14 results. However operating costs in that year were higher than 2012-13, primarily due to a number of one-off expense items. As a result, Queensland Rail does not consider the 2013-14 operating costs will necessarily reflect its longer term expectation of efficient operating costs. Queensland Rail is therefore prepared to fully adopt an operating cost forecast as per the QCA's Draft Decision.

These costs have been indexed at actual inflation for 2013-14 (3.2%), and forecast inflation to 2015-16 (2.5% per annum). The table below sets out the 2012-13 costs and their translation to 2015-16.

Table 17 Other operating costs (whole of network) – base year translation

Item	$m 2012/13	$m 2015/16
Train Control	2.000	2.169
Corporate Overhead	1.568	1.700
Other	2.961	3.211
	6.529	**7.080**

Costs from 2015-16 for the remainder of the regulatory period are indexed at forecast inflation (2.5%) in accordance with the QCA's Draft Decision.

Queensland Rail has also included working capital, forecast at 0.3% of proposed total revenue. This accords with the QCA's approach in the Draft Decision.

The allocation of these costs is discussed in Part 3.3.

3.3 Allocation between coal and non-coal traffics

As stated above, the West Moreton Network was originally designed to carry agriculture and general freight products, with coal services commencing from the Wilkie Creek mine in 1994. Unlike the CQCR, the West Moreton Network has carried a comparatively higher proportion of non-coal services, recognising that these volumes are forecast to be low for the 2015-20 period. Accordingly, there is an issue around the allocation of costs between coal and non-coal services.

3.3.1 Allocation of the opening asset value

In its June 2014 Consultation Paper, the QCA identified two objectives in determining the appropriate allocation methodology:[44]

a) *Queensland Rail's reasonable desire to recover the investment it has made in the network to support the growth of coal traffic*

b) *Coal miners' interest in not paying for assets they are unable to use, whether that be because those paths are contracted to non-coal traffics or where a significant portion of capacity cannot be contracted because of restrictions that provide priority to passenger services on the metropolitan system.*

In developing its approach to allocating the July 2015 opening asset value, Queensland Rail has reconsidered how these objectives are addressed in the current volume outlook in a balanced manner. This has resulted in some amendment to Queensland Rail's 2013 DAU proposal in relation to the allocation of the opening asset value.

For the 2015 DAU, Queensland Rail's general approach to allocating the asset value is that it should reflect the way in which capacity is allocated between coal and non-coal services. In order to achieve this, Queensland Rail considers that the most appropriate way to assess the way in

[44] Queensland Competition Authority (2014a). p.34.

which capacity is allocated between coal and non-coal services is based on their share of forecast train path utilisation.

However, in order to reflect that there are a number of additional factors, apart from forecast usage, that impact on the proportion of capacity that coal services are able to use, Queensland Rail has made a number of adjustments to the allocation of opening asset value, as follows:

- Post 1995 assets – Queensland Rail has allocated the opening asset value to reflect forecast train path utilisation, but has applied a cap to the allocation of these assets to coal in order to reflect Government constraints on contracting capacity to coal; and
- Pre-1995 assets – Queensland Rail has further reduced the allocation of pre-1995 assets to coal in order to reflect the impact of the metropolitan peak hour in terms of sterilising capacity that would otherwise be available on the West Moreton Network.

Details of Queensland Rail's proposal for the 2015 DAU are set out below.

3.3.1.1 General train path allocation methodology

For the 2015 DAU, a number of cost categories have been allocated between coal and non-coal services based on a train path allocation approach. This is consistent with the approach used for the 2013 DAU and was originally developed in the context of the QCA's 2010 Pricing Decision (which formed the basis of the current reference tariffs), as a means of sharing costs between coal and non-coal services in order to arrive at a reasonable ceiling price for coal users.

As stated by the QCA at the time:[45]

> *Put another way, it is not necessary for the non-coal traffics to pay the same tariffs as coal traffics. It is only necessary that the tariffs charged to the coal services not subsidise the noncoal services. So, if QR Network charges the other traffics lower tariffs, the Authority is entitled to treat those traffics as though they pay the same tariff as coal, when assessing whether QR Network is receiving sufficient revenue. Any shortfall in non-coal revenue is a commercial matter for QR Network, which may be addressed by the TSC subsidies from the state government.*

In determining the specific allocation to coal, there are two key elements to consider:

- the appropriate measure of coal's usage – that is the numerator; and
- the appropriate measure of total paths shared between coal and non-coal – that is the denominator.

For the 2013 DAU, Queensland Rail had proposed that the train path allocator be based on coal's share of contracted paths, that is, both the numerator and the denominator would be based on contracted paths. Contracted paths were applied, as this was considered to be the most reliable indicator of forecast use, for both coal and non-coal services.

In its Draft Decision, the QCA accepted that the forecast of coal use should be based on contracted services, but that the forecast of total paths (i.e. the denominator) should be based on available, not contracted, services. The QCA did not discuss the implications of using available paths to allocate costs in any detail, but rationalised this on the basis that it would provide Queensland Rail with a stronger incentive to increase the number of paths contracted for coal services, promoting efficient use of the network.

[45] Queensland Competition Authority (2009). p.79.

Queensland Rail rejects the QCA's approach not only on the basis that it already has a very strong incentive to maximise the number of paths for coal services, but also on the basis that the QCA's approach will, contrary to the pricing principles in the QCA Act, prevent Queensland Rail from fully recovering its efficient costs.

Queensland Rail's incentives to maximise paths for coal services

As noted in Part 1, contracting behaviour has changed materially in the last two years, with only 53 paths per week currently contracted for coal. While forecast usage is above this (62.8 paths), it is still well below total available paths. It is certainly not the case that paths need to be 'freed up' from non-coal services to allow more capacity to be allocated to coal.

Particularly in the current environment, Queensland Rail's primary concern is revenue certainty. It has more to lose and less to gain from 'deliberately' under-contracting paths for coal, which also presumes that it has primary control over what is contracted.

Instead, Queensland Rail would clearly be better off if it could increase the number of paths contracted to coal (subject to the Government imposed cap on paths for coal services, discussed below), as it provides it with increased revenue certainty for services that have a higher capacity to pay than non-coal services. However, ultimately the number of paths that are contracted is driven by the end-user, with Queensland Rail only having limited influence over this (unless there are more requests for contracted paths than available paths on the network). There is less imperative for users to lock in contracted paths at the current time given the available capacity on the network, particularly following the closure of the Wilkie Creek mine, however this situation could change if and when new developments come onto the West Moreton Network.

In any case, Queensland Rail is not proposing to set prices based on contracted paths. It is proposing to base them on forecast paths, which are well above contracted paths. This should address any concern that the QCA or users may have that Queensland Rail will be incentivised to 'under contract' coal paths in order to manipulate tariffs.

Assessing usage share based on proportion of available paths

Assessing coal's share of usage based on available paths (rather than total forecast usage) means that Queensland Rail will be prevented from recovering all of the efficient costs of providing access to the rail infrastructure to the extent that there are any unused paths.

While the QCA has sought to characterise this approach as a reversion to the methodology used for the 2010 reference tariffs, Queensland Rail has not identified any specific discussion on this issue in the QCA's 2009 Draft Decision or 2010 Pricing Decision, or any evidence that this approach was actually used. While the 2009 Draft Decision does discuss the allocation of the asset value based on coal's share of available paths, this is in the context of the differentiation of pre- and post-1995 assets, and the approach of discounting the allocation of pre-1995 assets in order to reflect the potential paths that are not available due to the metropolitan passenger constraints.

Indeed, the QCA's adopted allocation of 75.4% to coal can only have been derived based on an allocation of total forecast usage, as available paths have remained constant at 112 over the last 7 years, with coal's usage increasing up to 2013. While the QCA did not provide any data to support its derived allocation of 75.4% to coal, Queensland Rail has sought to replicate this allocation based on the data that was being used in QR Network's model at that time. The path

allocation derived with this data is 75.54%, which is close, but not identical, to the QCA's stated 75.4% allocation. This allocation is based on the average of coal's share of forecast paths, as forecast in QR Network's ceiling price model.

Table 18 Loaded weekly paths forecast – Toowoomba Range as at March 2009

Traffic type	2009-10	2010-11	2011-12	2012-13
Coal	63	77	82	82
Freight	25	25	25	25
Passenger	2	2	2	2
Total	**90**	**104**	**109**	**109**

Table 19 Train Path % adopted as at March 2009

Traffic type	2009-10	2010-11	2011-12	2012-13
Coal	70.65%	76.52%	77.50%	77.50%
Freight/Passenger	29.35%	23.48%	22.50%	22.50%
Average allocation to coal	**75.54%**			

Further, the QCA's proposed approach is inconsistent with the QCA's description of its rationale as stated in the 2009 Draft Decision (quoted above), which was simply to 'treat those [non-coal] traffics as though they pay the same tariff as coal, when assessing whether QR Network is receiving sufficient revenue.'

When Queensland Rail requested further information from the QCA relating how this recommendation accorded with the QCA Act pricing principles, the QCA simply reiterated that:[46]

> *In its assessment the QCA assumes for assessing revenue adequacy that all services are paying the highest tariff. This is based on a principle in the current undertaking that was also proposed by Queensland Rail in its now-withdrawn DAU.*

Again, this explanation by the QCA does not adequately explain its proposal. Rather, it confirms the principle (already accepted by Queensland Rail) that non-coal services will be treated as if they are making the same contribution to these cost categories as coal services for the purpose of assessing the ceiling price for coal. This does not address Queensland Rail's fundamental concern with the QCA's recommendation allocation methodology, which clearly results in assessed efficient costs remaining unallocated to any user.

Queensland Rail does not consider that the QCA's proposed treatment is reasonable, nor is it consistent with standard regulatory precedent, as it will be unable to recover the share of costs that cannot be allocated to any user as they relate to the proportion of paths that will not be utilised. This shortfall will potentially be significant. Indeed, in the current environment, after allocating costs to coal and non-coal services this would result in 41% of costs being unallocated to any user.

[46] Letter from QCA to Queensland Rail, 8 April 2015.

This is not consistent with the pricing principles in the QCA Act, which entitles Queensland Rail to "generate expected revenue for the service that is at least enough to meet the efficient costs of providing access to the service"[47]. This requirement emanated from the Competition Principles Agreement[48] and hence is a standard feature of Australian access regimes and accordingly, is accepted regulatory practice. While there are certain aspects of the West Moreton Network that make it different to other regulated networks, such as the CQCR, this cannot justify a departure from legislated pricing principles.

Queensland Rail's 2015 DAU proposal

Queensland Rail considers that the most reasonable way of applying the train path allocator for both the numerator and the denominator is based on forecast train paths, where forecast train paths for both coal and non-coal services are developed based on the best available information on likely usage, as reflected in the forecasts proposed by Queensland Rail in Part 1. This approach is fully consistent with the QCA's stated position that non-coal traffics should be treated as if they are paying the same tariff as coal traffics for the purpose of assessing the ceiling price for coal services.

Based on forecast train services set out in Part 1, this results in following allocations:

- Rosewood – Jondaryan – 95.4%
- Jondaryan – Columboola – 87.5%.

Queensland Rail considers that this approach is more consistent with the requirements of the QCA Act and regulatory treatment more generally, noting that the pricing principles in all Australian access regimes are premised on the entitlement of the infrastructure provider to recover its efficient costs.

3.3.1.2 Cap on allocation of opening asset value to coal services

While the general train path allocation methodology described above reflects coal's share of utilised paths, Queensland Rail also acknowledges that there are a number of factors that restrict it in its ability to contract the full amount of the capacity created by the existing assets (and which is reflected in the opening asset value as at 1 July 2015). The two main constraints are:

- preserved freight and passenger train paths from Rosewood to Toowoomba , which is currently 13 paths for freight and two for passenger services; and
- Queensland Rail's Responsible Ministers have specified a constraint of 87 coal paths per week through Metropolitan Network.

Queensland Rail therefore considers that it is reasonable that the extent of the opening asset value as at 1 July 2015 that is allocated to coal under the train path allocation methodology is capped to reflect the effect of these constraints. In particular, the binding constraint is the maximum 87 coal paths per week, limiting the proportion of the capacity of the West Moreton Network that can potentially be contracted to coal to 87 out of 112 available paths, or 77.7%. This approach is consistent with the overarching objectives established by the QCA (as set out at the beginning of this section) of balancing Queensland Rail's right to recover its costs from users with mining customers' right to not be required to pay for capacity that they are not permitted to use.

[47] Cl.168A(a)
[48] Cl. 6(f)(2)(1)

Given the asset value has been established on the basis of this constraint, it should be reviewed if there is any material change to that constraint in the future.

3.3.1.3 Treatment of common network capex

In the 2013 DAU, Queensland Rail had proposed to allocate post-1995 assets in the following way:

- Assets in existence as at the valuation date (2008) were allocated in accordance with the way in which capacity was allocated between coal and non-coal services; and
- Assets that were created after the valuation date were allocated based on the identity of the users that triggered that investment. Given that most investment on the West Moreton Network was for the purpose of improving underlying track strength and reliability in order to cater for increased coal tonnages, most capex was allocated 100% to coal. The exception was those projects that were triggered by freight services (referred to as TSC capital), which were allocated 100% to non-coal.

In its Draft Decision, the QCA took the view that all track strengthening and reliability projects should be treated as investment in common network assets, which should be allocated consistently to all beneficiaries of the common network. While freight services may not require this investment immediately, they remain beneficiaries as the investment would ultimately be required even in the absence of coal services. It stated that:[49]

> *…the QCA considers that a pro rata allocation of the incremental common network spending will create incentives for Queensland Rail to increase the number of train paths allocated to coal and promote efficient use of the network, as more capacity will be allocated to the highest and best possible use (i.e. coal train services).*

On further consideration of this issue, Queensland Rail has decided to accept the QCA's proposed approach to the allocation of this post-2008 investment between coal and non-coal services. As discussed in Section 3.1.1 in relation to the opening asset value, this means that the opening asset value for the West Moreton Network now includes the full value of investments that were previously treated as being either coal or freight-related assets.

Capex that has occurred between 2008 and the opening value date of 1 July 2015 is now allocated between coal and non-coal services in the same way that other post-1995 assets are allocated, that is based on the relative share of forecast train paths, with coal's allocation capped at 77.7%.

3.3.1.4 Adjustment to pre-1995 assets for metropolitan capacity constraints

Queensland Rail proposes that, consistent with previous practice, a reduction will be applied to pre-1995 asset values to reflect the impact on West Moreton Network capacity from the allocation of Metropolitan Network capacity to passenger services. While Queensland Rail considers that this approach is not required from an economic theory perspective[50], it reflects a pragmatic way of addressing the concerns of customers around the impact of the passenger dominated Metropolitan Network on the available capacity of the West Moreton Network.

[49] Queensland Competition Authority (2014b). p.146.
[50] PWC report appended to Queensland Rail submission on consultation paper, p 18-19

However, Queensland Rail considers that it is vital that the applied reduction is based on the most rigorous available assessment of the actual capacity impact of the Metropolitan Network on West Moreton capacity. During the process of developing the 2013 DAU and responding to the QCA's Consultation Paper, Queensland Rail has substantially increased the level of rigour that it has applied to assessing the true impact of the Metropolitan Network on coal and freight movements. The increased thoroughness of this analysis was driven by concerns from both stakeholders and the QCA's consultant, B&H, that Queensland Rail's assessment of operational capacity impacts may understate the impact on West Moreton Network capacity. In particular, B&H identified a number of methodological issues that it considered would increase the robustness of the analysis and the resulting confidence in the results.

Therefore, while the adjustment applied for the 2008 AU reflected a fairly simple assessment of the operational impact on West Moreton train services, based on the assumption that no coal trains would be permitted to operate through the Metropolitan Network during the peak passenger periods, the 2015 DAU adjustment reflects a much more thorough and nuanced analysis of the Metropolitan Network capacity impact.

In this regard, it is important to note that, while the Metropolitan Network is clearly capacity constrained, the ability to access paths through the Metropolitan Network does not create the major limitation on West Moreton Network capacity. West Moreton Network capacity is fundamentally established by the number of paths available across the Toowoomba range. The Metropolitan Network will only actually limit the capacity of the West Moreton Network if, and to the extent that, it prevents Queensland Rail from operating trains on the available paths over the critical section – that is the Toowoomba range.

Consistent with the conclusions reached by the QCA's consultant, B&H, Queensland Rail considers that there are two factors that cause some available West Moreton paths to be unusable due to the Metropolitan Network – capacity restrictions during peak passenger periods and Metropolitan Network maintenance closures which are in excess of what is required for the West Moreton Network.

In terms of the peak passenger periods, while these are colloquially referred to as the 'metropolitan blackout periods', they do not actually impose a blanket ban on the operation of coal and freight services. The term "blackout" is a misnomer and factually incorrect. While it can be challenging, at times, for Queensland Rail's network planners to find through paths for coal and freight services during peak periods, some paths can and are made available – refer to the current MTP diagrams in Appendix 5. This is particularly the case for trains travelling in the opposite direction to peak, and Queensland Rail regularly schedules empty trains travelling towards Toowoomba in the morning peak, and loaded trains travelling to Port of Brisbane in the afternoon peak.

The other capacity related impact from the Metropolitan Network occurs as a result of maintenance closures. Maintenance on the Metropolitan Network is scheduled on a corridor basis, with track closures placed on the entire corridor in order to maximise maintenance productivity within the closure period. This system has been developed to ensure that all necessary maintenance work can be undertaken, while minimising the adverse impacts of track closures on passenger services. However, because services from West Moreton Network need to traverse multiple corridors to reach the Port of Brisbane, this results in closures on Metropolitan Network corridors affecting West Moreton train services every fourth weekend. To

the extent these closures are in excess of the closures required to properly maintain and renew the West Moreton Network, this will reflect a further capacity reduction caused by the Metropolitan Network.

Queensland Rail has adopted its updated analysis for the purpose of determining the capacity impact of the Metropolitan Network constraints. Details regarding the methodology Queensland Rail has used is provided in Appendix 5 - Impact of Metropolitan Network Constraints on West Moreton Network Capacity. This analysis confirms Queensland Rail's view that the Metropolitan Network impact on West Moreton Network theoretical capacity is 12.1%.

As part of its response to the QCA's Consultation Paper, Queensland Rail provided substantial detail on its assessment of the impact of metropolitan peak periods on West Moreton Network capacity. Appendix 5 further expands on this analysis and includes a range of additional material that clearly demonstrates Queensland Rail's claims. Given that Queensland Rail clearly explained its analysis in its response to the consultation paper, including showing a number of errors in the QCA's consultant's analysis that was used to derive the QCA's proposed 22% impact, it is not clear why the QCA elected to not review this issue for its Draft Decision.

Queensland Rail's analysis for this 2015 DAU:

- clearly demonstrates, including with the use of train diagrams and maintenance plans – see Appendix 5 - that the analysis relied upon by the QCA to arrive at its proposed 22% impact is flawed; and
- also clearly shows that the assumptions on the application of a 6 hour 'metropolitan blackout' used in the 2008 AU analysis are incorrect.

As a result, it would be inappropriate for the QCA to rely on either the Draft Decision 22% impact, or even the 2008 AU impact of 20%, as a reasonable 'baseline' assessment, from which Queensland Rail must provide compelling evidence to change. The standard of analysis used in the derivation of the proposed 12.1% adjustment is far higher than in either of these previous assessments, and it would be incorrect of the QCA to rely on either of those previous analyses simply because it considers that even more compelling information could potentially be provided. Rather, the QCA must base its assessment on the best quality analysis that it has available to it at the time.

Queensland Rail's 2015 DAU proposal

Through applying this increased rigour to the analysis, it has become clear that the impact of the Metropolitan Network is actually significantly less than had been surmised at the time that the 2008 AU was developed, or even when the 2013 DAU was submitted. Based on the maximum theoretical capacity analysis, Queensland Rail has demonstrated that the Metropolitan Network constraints will only reduce available capacity on the West Moreton Network by 12.1%. As discussed above, Queensland Rail believes that, in an operational sense, the impact is likely to be even less, given that Queensland Rail can utilise the 'sterilised' paths as reserve paths to allow recovery from unplanned variability.

Based on this analysis, Queensland Rail's 2015 DAU reflects an assessed 12.1% impact on West Moreton Network capacity as a result of Metropolitan Network constraints. This reduces the allocation of opening value for pre 1995 assets to coal services to 68.3%.

3.3.1.5 Summary of opening asset value allocated to coal services

In summary, the allocation of the West Moreton Network opening asset value to coal services is shown below:

Table 20 Opening asset value allocation to coal services ($m, 1 July 2015)

	Rosewood to Jondaryan		Jondaryan to Columboola	
Common Network opening asset value	339.5		132.1	
Time period	Pre 1995	Post 1995	Pre 1995	Post 1995
Coal Services Allocator %	68.3%	77.7%	68.3%	77.7%
Common Network asset value allocated to coal	130.6	115.2	75.5	16.8
Coal only sidings	0.6		15.4	
Coal Services allocated opening asset value	246.4		107.6	

3.3.2 Allocation of maintenance expenditure

The measure used to allocate maintenance costs between coal and non-coal services can be different to the measure used to allocate the asset value. For the purpose of allocating maintenance costs, while not all maintenance activities are volume-dependent Queensland Rail considers that the allocation measure should be based on the expected level of activity in coal and non-coal services. Forecast volumes is the best indicator of expected activity on the network and this is even more the case at the current time given the recent change in contracting activity described previously.

As such, for the 2015 DAU, Queensland Rail proposes to allocate maintenance costs between coal and non-coal services based on forecast GTKs. This is consistent with the approach proposed for the 2013 DAU and which the QCA accepted in its Draft Decision.[51] Queensland Rail proposes to maintain this allocation approach in the 2015 DAU. However, for the reasons outlined in Part 2, Queensland Rail is now proposing to base its forecast volumes on actual expected throughput rather than contract volumes, given the latter no longer provides a reasonable indicator of likely demand over the next five years.

Because the traffic mix varies on the two key route sections of the West Moreton Network, Rosewood to Jondaryan and Jondaryan to Columboola, Queensland Rail has further allocated costs between coal and non-coal services for each of these sections. The allocations are presented in the following table.

Table 21 Planned Maintenance Program Allocation

Item ('000gtks)	2015/16	2016/17	2017/18	2018/19	2019/20
Allocation 1:					
Total '000gtks					
Rosewood to Jondaryan	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

[51] Queensland Competition Authority (2014b). p.123.

Item ('000gtks)	2015/16	2016/17	2017/18	2018/19	2019/20
Jondaryan to Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Total	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Rosewood to Jondaryan	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Jondaryan to Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Allocation 2:					
Rosewood to Jondaryan '000gtks					
Coal	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Non-Coal					
Grain & Molasses	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Livestock	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Mixed Freight	[redacted]	[redacted]	[redacted]	[redacted]	-
Passenger	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Total Non-Coal	30,916	30,916	30,916	30,916	30,916
Total	1,697,139	1,697,139	1,697,139	1,697,139	1,697,139
Coal %	98.18%	98.18%	98.18%	98.18%	98.18%
Non-Coal %	1.82%	1.82%	1.82%	1.82%	1.82%
Jondaryan to Columboola '000gtks					
Coal	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Non-Coal					
Grain & Molasses	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Livestock	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Mixed Freight	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Passenger	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Total Non-Coal	14,873	14,873	14,873	14,873	14,873
Total	459,028	459,028	459,028	459,028	459,028
Coal %	96.76%	96.76%	96.76%	96.76%	96.76%
Non-Coal %	3.24%	3.24%	3.24%	3.24%	3.24%

Applying these allocators to the total West Moreton Network maintenance costs provides the maintenance cost allocation to coal services as shown below:

Table 22 Forecast maintenance expenditure allocated to coal services: 2015-20 ($m, nominal)

Rosewood to Jondaryan	2015-16	2016-17	2017-18	2018-19	2019-20
Track (excl. Mech Resleepering)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Mechanised Resleepering	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Structures	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Trackside Systems	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Other	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Maintenance cost allocation	**31.762**	**17.307**	**22.896**	**17.859**	**20.654**

Jondaryan to Columboola	2015-16	2016-17	2017-18	2018-19	2019-20
Track (excl. Mech Resleepering)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Mechanised Resleepering	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Structures	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Trackside Systems	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Other	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Maintenance cost allocation	**8.467**	**4.613**	**6.103**	**4.761**	**5.506**

3.3.3 Allocation of operating expenditure

Operating costs

Queensland Rail proposes to use its general train path allocator (as discussed in section 3.2.1.2) for allocating operating costs.

In its 2013 DAU Queensland Rail proposed to allocate operating costs to coal services based on the general train path allocator that is used for a number of cost components. This allocation methodology was endorsed by the QCA in its Draft Decision.

However, as discussed above, the QCA did not endorse the train path measure used by Queensland Rail. Instead, it referred to its proposed measure of total available paths, as proposed for the opening asset value, although it did not rationalise its application to the allocation of operating costs in any detail. It is therefore not clear why it is prepared to accept forecast usage to allocate maintenance costs but not operating costs.

As discussed above, Queensland Rail's key concern with the use of total available paths in allocating operating costs is that it will mean that it will not be able to fully recover its efficient costs. As such, this is not consistent with the pricing principles in the QCA Act, which entitles Queensland Rail to "generate expected revenue for the service that is at least enough to meet the efficient costs of providing access to the service"[52].

By using Queensland Rail's general train path allocator, Queensland Rail will have opportunity to fully recover the assessed efficient operating costs from the services that are expected to use the infrastructure.

Based on forecast train services set out in Part 1, this results in following allocations:

- Rosewood – Jondaryan – 95.4%
- Jondaryan – Columboola – 87.5%.

Queensland Rail considers that this approach is more consistent with the requirements of the QCA Act and regulatory treatment more generally, noting that the pricing principles in all Australian access regimes are premised on the entitlement of the infrastructure provider to recover its efficient costs.

Working Capital

As noted above, Queensland Rail has proposed a working capital allowance of 0.3% of the coal services MAR, consistent with the 2013 DAU and accepted as appropriate by the QCA in its 2014 Draft Decision.

Total Operating Costs

The total operating costs allocated to coal services based on Queensland Rail's proposed methodology is shown in the following table.

[52] Cl.168A(a)

Table 23 Forecast operating expenditure allocated to coal services: 2015-20 ($m, nominal)

Rosewood to Jondaryan	2015-16	2016-17	2017-18	2018-19	2019-20
Train control	1.629	1.670	1.712	1.755	1.798
Corporate overhead	1.277	1.309	1.342	1.375	1.410
Other	2.412	2.473	2.535	2.598	2.663
Working capital	0.157	0.161	0.165	0.169	0.174
Total	**5.476**	**5.613**	**5.753**	**5.897**	**6.045**

Jondaryan to Columboola	2015-16	2016-17	2017-18	2018-19	2019-20
Train control	0.404	0.414	0.425	0.435	0.446
Corporate overhead	0.317	0.325	0.333	0.341	0.350
Other	0.598	0.613	0.629	0.644	0.661
Working capital	0.063	0.065	0.066	0.068	0.070
Total	**1.382**	**1.417**	**1.452**	**1.489**	**1.526**

3.3.4 Allocation of forecast capex

For the 2015 DAU, Queensland Rail proposes to allocate forecast capex as follows:

- investment in general track strengthening and reliability is treated as common network expenditure, and allocated based on forecast train paths; and
- investment that is specifically required for a particular type of service (and which provides no benefits to the other services), will be allocated to those services.

In the 2013 DAU, Queensland Rail proposed to allocate capex depending on the trigger for the investment. That is, it will apply a 100% allocation to coal paths for projects that solely facilitate coal traffic (including those funded by end-users).

As discussed above, in the Draft Decision the QCA did not accept Queensland Rail's proposed treatment on the basis that investments made in the shared network infrastructure will benefit coal and non-coal users. It proposed that all track strengthening and reliability projects should be treated as investment in common network assets. It also proposed that the allocation should be based on available paths.

Queensland Rail proposes to accept the QCA's proposed treatment of investments in the shared network infrastructure. However, it does not accept that this allocation should be based on available paths. This is for the same reasons as set out above in relation to the allocation of opening asset value and operating expenditure. That is, an allocation based on total available paths is considered completely inappropriate as it will prevent Queensland Rail from recovering the efficient costs of investing in the network. This is because the QCA's approach will leave a substantial amount of future investment costs simply unallocated to users (to the extent that available paths are not contracted) and hence unable to be recovered. This is inconsistent with the pricing principles in the QCA Act.

Such a treatment also provides no incentive for Queensland Rail to undertake any future investment – indeed it provides a strong disincentive. An infrastructure owner cannot expect to commit to what will become a sunk investment on the basis that only a portion of those costs can

be allocated to existing users. Queensland Rail therefore considers that the allocation measure must be based on forecast expected usage, not total available paths.

Queensland Rail's 2015 DAU proposal is consistent with the approach recommended by the QCA in its Draft Decision, with the exception of the measure used to allocate paths. Basing the measure on forecast paths is essential if Queensland Rail is to retain any incentive to undertake future investments in the shared network.

Table 24 Forecast capex allocated to coal services: 2015-20 ($m, nominal)

	2015-16	2016-17	2017-18	2018-19	2019-20
Rosewood to Jondaryan	20.1	22.1	26.1	17.2	21.1
Jondaryan to Columboola	5.2	6.7	3.7	8.0	2.8
Total	**25.2**	**28.8**	**29.8**	**25.2**	**24.0**

3.3.5 Forecast roll forward of allocated RAB

Based on the allocation of opening asset value and future capex discussed in this Part 3.3, Queensland Rail's forecast roll forward of the allocated coal service RAB is as follows:

Table 25 Proposed roll forward of West Moreton Network allocated coal service RAB ($m, nominal)

	2015-16 (forecast)	2016-17 (forecast)	2017-18 (forecast)	2018-19 (forecast)	2019-20 (forecast)
Allocated opening value	354.0	365.9	381.5	399.9	412.9
Add allocated capex	25.2	28.8	29.8	25.2	24.0
Less inflation	9.2	9.5	9.9	10.3	10.6
Less depreciation	22.5	22.8	21.3	22.4	23.7
Closing value	365.9	381.5	399.9	412.9	423.8

Appendix 1 – PwC Paper: Reference Tariff for the West Moreton Network

www.pwc.com.au

Reference Tariff for the West Moreton Network

Queensland Rail

Supporting analysis for submission to the QCA

4 May 2015

pwc

Contents

Executive summary

Queensland Rail intends to submit to the Queensland Competition Authority (QCA) a draft access undertaking (the 2015 DAU) relating to third party access to Queensland Rail's rail network including the West Moreton Network, the Mt Isa Network, the North Coast Network and the Metropolitan Network.

Regulatory approval of a draft access undertaking provides a level of certainty to both access seekers and providers, reduces transaction costs and facilitates commercial decision making. But an access undertaking need not resolve every financial and non-financial aspect of a future access agreement. The premise of a negotiate/arbitrate model is that flexibility ought to be preserved for the parties to negotiate appropriate access terms, with recourse to the regulator only where required.

Queensland Rail intends to submit to the QCA a reference tariff for the West Moreton Network which is below the "ceiling" tariff which Queensland Rail considers a regulator would determine, using generally-accepted regulatory methods (including a DORC network valuation).

PwC has been engaged by Queensland Rail to provide advice on factors that are relevant to Queensland Rail determining a reference tariff below the ceiling price. Queensland Rail proposes to:

- set a ceiling price based on a generally-accepted regulatory building block approach, which reflecting the current utilisation of the network suggests a ceiling access charge of $34.92/'000 gtk.
- within a negotiate/arbitrate model, determine a reference tariff at a lower rate of $19.41/'000 gtk.

In our view, there is no single, formulaic way to express how a reference tariff may appropriately vary from a conventionally-calculated ceiling. Rather, the difference reflects a range of commercial, economic, user and system-specific factors, which may vary over time.

Particularly relevant is the impact of the sharp decline in market conditions facing thermal coal exporters on the users of Queensland Rail's West Moreton Network.

Queensland Rail is responding to these market conditions by proposing a new arrangement whereby the reference tariff is set below the price ceiling, but at a level which is similar to the currently applied access charge. Queensland Rail believes that flexibility is necessary in order to preserve its customer base. Without this flexibility, network assets could become stranded which would not be in the interests of Queensland Rail, current access holders and future access seekers. Following this regulatory period, consistent with the negotiate/arbitrate model, Queensland Rail and access seekers will be able to negotiate different terms as market conditions improve.

The following points summarise our key findings:

1. The ceiling price should be set on sound economic principles and follow generally-accepted regulatory principles. A ceiling tariff ought to be determined using a building block approach, using appropriate parameters, including a current-cost valuation of network assets.
2. The reference tariff for the West Moreton Network could reasonably be determined within a negotiate/arbitrate framework, where the agreed tariff is below the ceiling price.
3. In determining the reference tariff to apply, Queensland Rail might consider the current market conditions facing the coal industry and acknowledge also the advantage of providing access seekers with a degree of price stability. Relevant in this regard is the relativity with a long term benchmark for West Moreton Network below-rail access charges.
4. Under the proposed reference tariff, volume risk on the West Moreton Network would be borne by Queensland Rail with customers benefiting from a reference tariff lower than any ceiling charge. Following this regulatory period, consistent with the negotiate/arbitrate model, Queensland Rail and access seekers will be able to negotiate different terms as market conditions improve.

1 Introduction

1.1 Background

Queensland Rail's primary business is the delivery of public transport through the provision of passenger rail services and supporting private freight services through the provision of rail infrastructure. Queensland Rail's intra-state rail network is declared for access under Part 5 of the *Queensland Competition Authority Act 1997* (the QCA Act). It also is subject to the terms of the access undertaking approved by the Queensland Competition Authority (QCA) in 2008 (as revised in 2010).

Queensland Rail owns and operates the West Moreton Network which extends from Macalister to the Port of Brisbane. While the entirety of Queensland Rail's intra-state rail network is subject to declaration and coverage under the 2008 undertaking, a reference tariff only exists for coal train services on the West Moreton Network. The West Moreton Network tariff is paid by users to Queensland Rail for trains carrying thermal coal from mines on the Darling Downs to the Fisherman Islands export terminal at the Port of Brisbane.

In the relatively recent past, the export market for thermal coal has deteriorated such that, combined with reductions in other traffics, Queensland Rail's West Moreton Network has significant spare capacity - an estimated 46 paths, or 41 per cent of paths, are currently unused. These factors conspire to create a situation where a "ceiling" tariff, calculated using generally-accepted regulatory methods, is above the level which could reasonably be expected to be commercially-feasible to Queensland Rail's West Moreton Network access holders and seekers.

1.2 2013 Draft Access Undertaking (2013 DAU)

The current access undertaking that applies to Queensland Rail is based on QR Network's 2008 Access Undertaking. The 2008 access undertaking was revised in 2010, and is due to expire on 30 June 2015, unless extended.

Queensland Rail submitted a new draft access undertaking to the QCA in June 2013 (the 2013 DAU) that included a proposed tariff for the West Moreton Network of $22.22/'000 gtk.

In response to the 2013 DAU, the QCA released a Consultation Paper in June 2014 which provided two different approaches for calculating the access tariff:

- historical cost option resulting in a price of $13.59/'000 gtk, including placing a zero value of pre-1995 assets
- revised DORC option, resulting in a price of $17.21/'000 gtk, including adjusting the 2009 valuation to reflect an updated assessment of the network's condition.[1]

Following stakeholder feedback and further consideration, the QCA released a Draft Decision for the 2013 DAU in October 2014, suggesting that a tariff of $14.29/'000 gtk was appropriate, based on a revised asset valuation.[2]

In a separate report, we comment on the QCA's approach to asset valuation in this Draft Decision. Although not stated as such, it would seem that the QCA has sought to "moderate" the valuation as proposed by Queensland Rail, in the view that to apply this valuation unadjusted would derive a tariff which was commercially unfeasible to users on the West Moreton Network. This approach is inconsistent with regulatory precedent.

---

1 Queensland Competition Authority (2014), *Consultation Paper on Queensland Rail's 2013 Draft Access Undertaking*.

2 Queensland Competition Authority (2014), D*raft Decision on Queensland Rail's 2013 Draft Access Undertaking*, page 139.

1.3 2015 Draft Access Undertaking (2015 DAU)

Due to significant changes in the business environment and changes to the QCA's regulatory approach, Queensland Rail withdrew 2013 DAU in December 2014.[3] In order to take into account these changes, and ensure that Queensland Rail's access undertaking is fit for purpose, Queensland Rail is proposing amendments to 2013 DAU. A revised draft access undertaking (2015 DAU) is to be submitted by Queensland Rail to the QCA by 5 May 2015 in accordance with the QCA's initial undertaking notice.

The 2015 DAU will apply to all third party access to Queensland Rail's network including the West Moreton Network, the Mt Isa Network, the North Coast Network and the Metropolitan Network. Queensland Rail currently has 45 access agreements with access holders including:

- 7 access agreements for the West Moreton Network
- 8 access agreements for the Mt Isa Network
- 12 access agreements for the Metropolitan Network
- 11 access agreements for the North Coast Network
- 7 access agreements for the other Networks (West, South Western, Maryborough and Tablelands).

Queensland Rail's 2015 DAU proposes to "decouple" the ceiling tariff the regulator would determine, using conventional building block methods, from the reference tariff that would apply to current and future users on the West Moreton Network. This allows the network valuation to be reconsidered, knowing that it does not impact directly the reference tariff that would apply.

Queensland Rail proposes in the 2015 DAU to set a Reference Tariff for the West Moreton Network which is below the "ceiling" tariff that otherwise would apply due to the following principles:

- the ceiling price for the West Moreton Network coal services should be assessed using generally-accepted regulatory principles based on a building block approach
- if this ceiling price is in excess of what reasonably could be recovered from West Moreton Network users then the reference tariff should be set below the ceiling price.

Indeed, Queensland Rail's proposed approach for the West Moreton Network is broadly consistent with that adopted for Queensland Rail's other systems, including the Mt Isa and North Coast Networks. For these networks access charges are set between the floor and the ceiling prices, based on the specific circumstances of each user, the terms of their access agreement and market conditions.

1.4 Disclaimer

This Report has been prepared for Queensland Rail under the terms of our Engagement Contract with Queensland Rail. As an independent report, it has been prepared for Queensland Rail but does not necessarily reflect the views of Queensland Rail.

In preparing this Report we have only considered the circumstances of Queensland Rail. Our Report is not appropriate for use by persons other than Queensland Rail, and we do not accept or assume responsibility to anyone other than Queensland Rail in respect of our Report.

---

3 Queensland Rail: 2013 DAU withdrawal letter addressed to Mr Hindmarsh, Chief Executive Officer of QCA, dated 12 December 2014. [http://www.qca.org.au/Rail/Queensland-Rail/More-on-QLD-Rail/Draft-Access-Undertaking/Archive/2013-Draft-Access-Undertaking].

The information, statements, statistics and commentary (together the 'Information') contained in this report have been prepared by PwC from material provided by Queensland Rail, and from other industry data sources external to Queensland Rail. PwC may at its absolute discretion, but without being under any obligation to do so, update, amend or supplement this document.

PwC does not express an opinion as to the accuracy or completeness of the information provided, the assumptions made by the parties that provided the information. PwC disclaims any and all liability arising from actions taken in response to this Report. This Report does not constitute legal advice.

The Information contained in this Report has not been subjected to an Audit or otherwise verified. The information must not be copied, reproduced, distributed, or used, in whole or in part, for any purpose other than as detailed in our Engagement Contract without the written permission of Queensland Rail and PwC.

2 Setting the price ceiling

2.1 Applying sound regulatory principles

Queensland Rail has proposed the use of a building block methodology to set the ceiling tariff for the West Moreton Network. The use of the transparent and repeatable building block approach will provide a degree of revenue/cost certainty going forward, for Queensland Rail and access seekers. It is also a fairly conventional and uncontroversial approach.

Section 138(2) of the QCA Act requires the QCA to take into account the following matters (*assessment criteria*) when approving an access undertaking:

> *(a) the object of Part 5 of the QCA Act which is, to promote the economically efficient operation of, use of and investment in, significant infrastructure by which services are provided, with the effect of promoting effective competition in upstream and downstream markets*
>
> *(b) the legitimate business interests of the owner or operator of the service*
>
> *(c) if the owner and operator of the service are different entities, the legitimate business interests of the operator of the service*
>
> *(d) the public interest*
>
> *(e) the interests of persons who may seek access to the service*
>
> *(f) the effect of excluding existing assets for pricing purposes*
>
> *(g) the pricing principles, which in relation to the price of access to a service should,*
>
> *i. generate expected revenue for the service that is at least enough to meet the efficient costs of providing access to the service and include a return on investment commensurate with the regulatory and commercial risks involved*
>
> *ii. allow for multi-part pricing and price discrimination when it aids efficiency*
>
> *iii. not allow a related access provider to set terms and conditions that discriminate in favour of the downstream operations of the access provider or a related body corporate of the access provider, except to the extent the cost of providing access to other operators is higher*
>
> iv. *provide incentives to reduce costs or otherwise improve productivity*
>
> *(h) any other issues the authority considers relevant.*

The QCA Act does not provide any specific guidance on asset valuation or methodology, beyond stating that the expected revenue for the access provider should '*include a return on investment commensurate with the regulatory and commercial risks involved*'.[4] The QCA is required to have regard to wider considerations such as the legitimate business interests of the provider of the services and interests of the users.

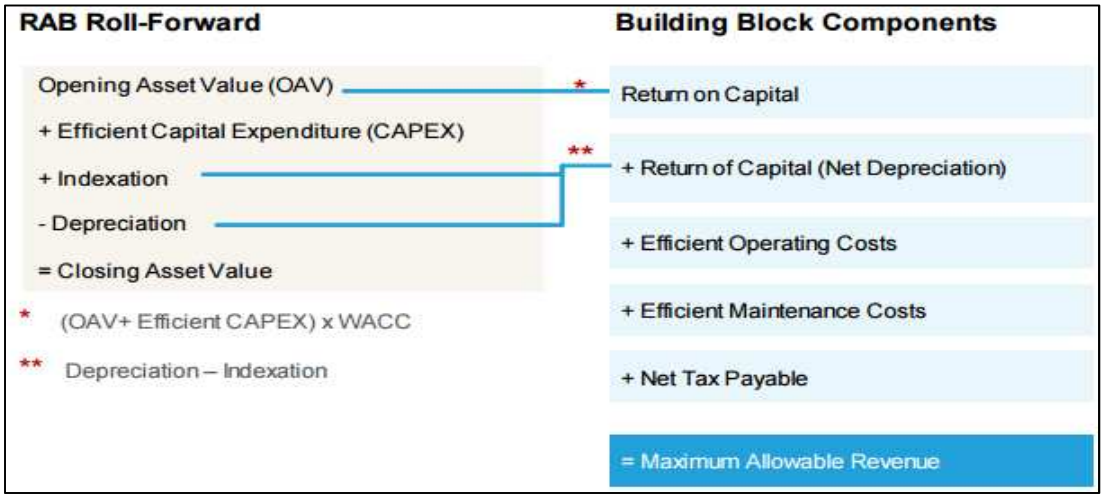
The building block approach assesses the revenue requirement for regulated businesses to ensure the business has adequate revenue to meet the efficient costs of providing access to regulated services. This should include a return on investment commensurate with the regulatory and commercial risks involved, consistent with sections 138(2)(g) and 168(A)(a) of the QCA Act. Indeed, in its Draft Decision on Aurizon's network in 2014, the QCA considered the application of the building block model to be consistent with the requirements of the QCA Act.[5] The QCA's approach in relation to the building block methodology is summarised in Figure 1.

---

4 *Queensland Competition Authority Act 1997*, section 168A(a).

5 Queensland Competition Authority (2014), *Draft Decision Aurizon Network 2014 Draft Access Undertaking – Maximum Allowable Revenue*, page 28.

Figure 1: Building Block Approach



Source: QCA, Draft Decision Aurizon Network 2014 Draft Access Undertaking – Maximum Allowable Revenue, September 2014.

2.2 Decoupling the price ceiling from the reference tariff

Access undertakings can promote economic efficiency and align incentives for efficient operation and investment in the supply chain, benefiting both access providers and seekers.[6] A negotiate/arbitrate model, where tariffs are set between a floor and ceiling, by definition contemplates that an access tariff might be determined to be less than the regulator-determined ceiling. Examples of such an approach include:

- ***Intra-state rail regime in NSW*** – the NSW Rail Access Undertaking makes provision for third party access to the rail network in NSW for which Railcorp or the ARTC is the owner. The Independent Pricing and Regulatory Tribunal (IPART) sets a floor and ceiling price with access providers and seekers then negotiating within this range.
- ***Intra-state rail regime in South Australia*** – the Essential Services Commission of South Australia (ESCOSA) is responsible for conducting 5-yearly reviews into the Access Regime that applies to the major intrastate railways in South Australia. This review includes setting a floor and ceiling price during the access undertaking process. The Tarcoola-Darwin rail regime in particular uses a 'sustainable competitive price' taking into consideration competition from other transport modes with the rail line. The ceiling access price is based on the highest price the provider could charge having regard to the costs of other transport modes.[7]
- ***Water services provided by Essential Energy*** – as part of the price review process, IPART may determine the maximum price that Essential Energy can charge for monopoly services. The services which, if supplied by Essential Energy, are declared as monopoly services include: water supply services, sewerage services, trade waste service and ancillary customer services.[8] The water service provider can then charge a usage charge below the approved ceiling price.

The determination of the ceiling tariff should reflect established regulatory practice and focus on the reasonably efficient costs of a hypothetical new entrant. The applied reference tariff might take into account a range of other commercial, system-specific and temporal factors.

---

6 Productivity Commission (2013), *National Access Regime, Inquiry Report no. 66*, Canberra, page 192.
7 *Ibid*, page 192.
8 IPART (2014), *Essential Energy's water and sewerage services in Broken Hill - Review of prices from 1 July 2014 to 30 June 2018*, Final Determination.

Reflecting these principles, Queensland Rail intends to propose for the West Moreton Network:

- A ceiling price based on a generally-accepted regulatory building block approach, which reflecting the current utilisation of the network (60 per cent) suggests a ceiling access charge of $34.92/'000gtk.
- A lower reference tariff for the West Moreton Network of $19.41/'000gtk applying from the commencement of 2015 DAU, and fixed (other than for indexation) over the term of the undertaking.

It is noted that the reference tariff for the Metropolitan Network is linked to the reference tariff for the West Moreton Network, adjusted for any incremental capital expenditure. The access charge that will be applied to the West Moreton Network is a combination of a per train path charge and per gtk component (50:50 share in each), with a separate train path component for the Metropolitan System which covers the incremental capital expenditure in that section.

In substance, this approach takes into account the interests of access seekers when setting the reference tariff, in accordance with section 138(2)(e) of the QCA Act, rather than seeking to address these factors in determining a ceiling tariff (through the asset value, or other building block parameter).

This approach also provides transparency to other access seekers and a level of certainty regarding how the ceiling price is determined for all users. These factors sometimes are identified as criticisms of a negotiate/arbitrate model, insofar as each access seeker may otherwise have to "re-litigate" each matter with the regulator.

3 Setting a reference tariff

There is no single, formulaic way to express how a reference tariff may appropriately vary from a conventionally-calculated price ceiling. Rather, the difference reflects a range of commercial, economic, user and system-specific factors, which may vary over time.

For the West Moreton Network, key factors include:

- Setting a reference tariff that seeks to maximise the traffic on the West Moreton Network without compromising the pricing principles of the QCA Act
- long term price stability including the relativity with long term benchmarks for the West Moreton Network below-rail access charges.

3.1 Maximising traffic on the Network

Ultimately, ensuring the commercial viability of the West Moreton Network is in the interests of Queensland Rail. Establishing access charges which are affordable to end users is a key consideration for Queensland Rail.

The volume of coal hauled on the West Moreton Network impacts the ceiling price in two offsetting ways:

- higher export volumes of coal lead to the greater utilisation of coal train paths, resulting in a higher allocation of shared network costs to coal services, but
- costs are then converted to unit rates (gtk) based on the volumes hauled, generally leading to a net reduction in access charges.

The decline in volumes of thermal coal hauled on the West Moreton Network has impacted Queensland Rail's revenue by approximately $16 million, or more than 25 per cent of the revenue linked to the West Moreton Network reference tariff regime.

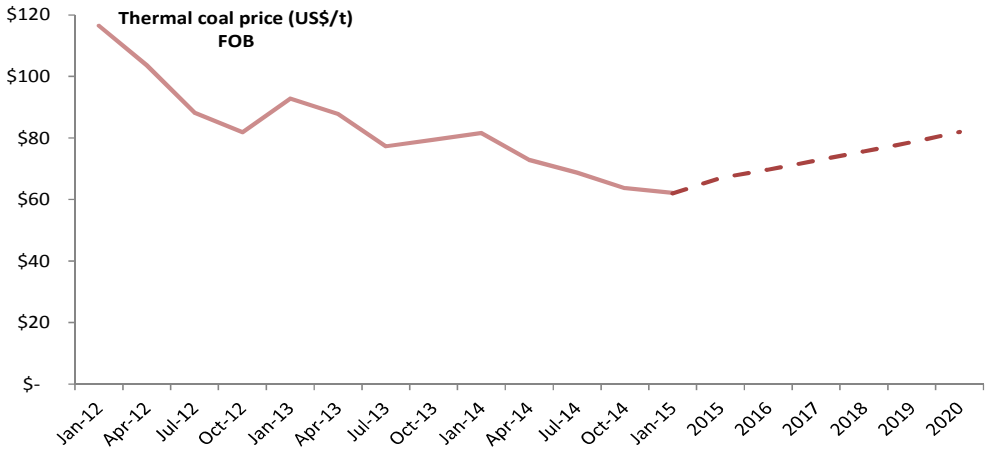
Looking forward, Queensland Rail's forecast coal volumes/network utilisation suggests a relatively high ceiling price of $34.92/'000gtk.

Market conditions for thermal coal are set to improve

The thermal coal export industry has experienced a sharp decline in prices over the last three years, with the FOB price for thermal coal halving between 2012 and 2014 (see Figure 2). Weaker than forecast demand, a lack of supply discipline at producer-level and greater than expected cost cutting were the main drivers of this underperformance in the coal sector.[9] This commodity price decline, however, is expected to be temporary with prices expected to settle at $75 per tonne (US$) by late 2016, and trend positively thereafter.[10]

9 World Bank, *Commodity Markets Outlook,* January 2015.
10 CLSA, *Sector Outlook – Global Coal*, November 2014.

Figure 2: Actual and forecast thermal coal prices (US$/t)



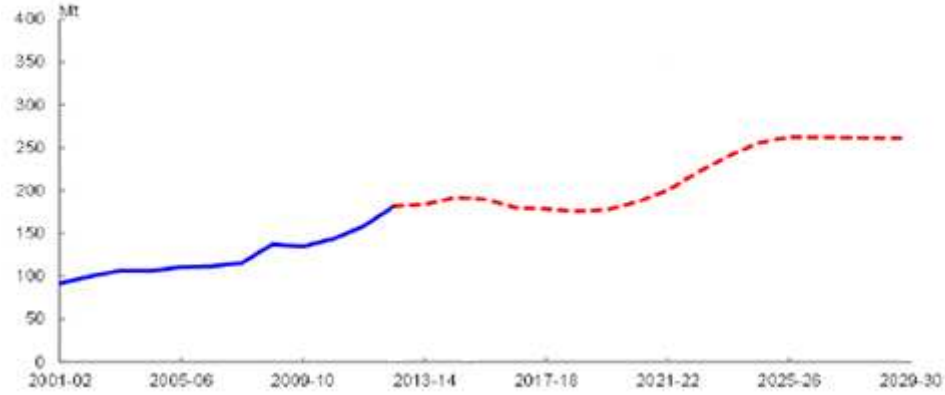
Source: World Bank Commodity Price Data, March 2015 (actual)
World Bank Commodity Markets Outlook, January 2015 (forecast)

Demand for thermal coal is set to increase with the two largest global importers of thermal coal, China and India, implementing policies to improve their coal allocation domestically (see Figure 3). This policy shift will drive demand in Australia with an expectation that Australia's coal export volumes will increase by over 25 per cent in the next decade (see Figure 4).

Figure 3: Thermal coal imports by region (Mt)

Source: Morgan Stanley, Global Metals Playbook – 2015 Outlook, December 2014.

Figure 4: Australian thermal coal export volume forecast (Mt)



Source: Australian Government, Treasury Working Paper – Long-Run Forecast of Australia's Terms of Trade, May 2014.

Market conditions facing thermal coal exports have deteriorated over the past 12-18 months. However, various forecasts suggest that market conditions will improve over the medium term, both in export price and anticipated volumes. Further depreciation in the exchange rate also could contribute to a material uplift in the $AUD value of thermal coal exports.

This supports an approach whereby the reference tariff applied could, in the future, adjust should more favourable market conditions allow, but still within the confines of a regulator-determined ceiling rate.

The interests of both access provider and seekers are considered within a negotiate /arbitrate framework

Access regulation aims to prevent wasteful duplication of investment in infrastructure with natural monopoly and bottleneck characteristics and to provide incentives for efficient investment.[11] An access undertaking has three objectives:

- to provide certainty for access seekers and providers
- to reduce transaction costs
- to facilitate commercial decision making.[12]

An access undertaking need not resolve every financial and non-financial aspect of a future access agreement. The premise of a negotiate/arbitrate model is that flexibility ought to be preserved for the parties to negotiate appropriate access terms, with recourse to the regulator only where required.

The role of the regulator, expressed generally, ought to be balancing the infrastructure operator's interests in recovering its efficient costs and the access seekers' interest in obtaining sufficient certainty about access terms and conditions, to reduce the risks associated with complementary investments.[13] The underlying objective of an access undertaking is to streamline the process for negotiating the terms and conditions of access, particularly where there are multiple access seekers.[14] The QCA Act contemplates this balanced position, by requiring the QCA to consider both the interests of the operator of the service (section 138(2)(b) and 138(2)(c)) and the interests of access seekers (section 138(2)(e)).

An access undertaking, while providing a level of certainty, should allow access seekers to Queensland Rail's West Moreton Network to negotiate at arm's length with the appropriate checks and balances in place within the negotiate/arbitrate framework. To this end, not all matters need to be determined during the access undertaking process. The draft access undertaking should facilitate commercial decision making through the negotiate/arbitrate framework.

In the negotiate/arbitrate framework the interests of the access provider and seekers are both relevant to commercial negotiations. Ensuring the commercial viability of its Network is in Queensland Rail's interests. In this instance, a reference tariff less than the price ceiling during a time of declining volumes is an appropriate commercial strategy.

In this circumstance, where Queensland Rail is proposing a reference tariff below the ceiling price, Queensland Rail will bear the volume risk associated with coal services. If volumes fail to improve, the price access seekers are willing to pay will be a key consideration in future access negotiations. In effect, customers will benefit from a reduced tariff with Queensland Rail bearing the risk of uncertain volumes.

---

11 ACCC (2013), *Submission to the Productivity Commission's Issues Paper on the Review of the National Access Regime*, page 45.
12 *Ibid*, page 24.
13 Productivity Commission (2013), *National Access Regime, Inquiry Report no. 66*, Canberra, page 203.
14 *Ibid*, page 203.

3.2 Tariff stability over the medium term

West Moreton Network access charges are currently $19.14/'000 gtk ($2014-15). The reference tariff proposed by Queensland Rail is, with indexation, not dissimilar to this existing tariff. Although this rate is significantly below what Queensland Rail considers a ceiling rate would be, there is merit in a tariff approach which provides a level of price stability over the medium term.[15]

This recognises that existing users on the West Moreton Network already are paying this access charge, and acknowledges also that Queensland Rail has before it a queue of access seekers whom, it could reasonably be argued, decided to submit for access knowing the current reference tariff.

Regulatory best practice acknowledges the promotion of price stability and predictability particularly between regulatory periods. The Australian Energy Market Commission, for instance, considers that good regulatory practice requires enhancing stability and predictability in prices and transparency of the process for setting prices in developing rules for electricity transmission pricing.[16] Similarly, the ACCC has recognised that the pricing mechanism chosen by the regulator must be transparent and promote price stability.[17]

The QCA has acknowledged that price stability is an important consideration for investors and customers alike. In its Statement of Regulatory Pricing Principles, the QCA has noted that, price stability leads to efficient outcomes,

> *Investors value stable returns in their own right and also because instability can create an uncertain political economy environment and cause investors to rethink, and possibly delay or even cancel previously planned projects. Moreover, producers and consumers may form expectations about the future course of prices (including expectations of price stability).*[18]

Over the long term, if coal volumes (and export prices) recover, then the gap between the ceiling price and the reference tariff may compress.

Relativity to long term ceiling benchmarks

Historically the West Moreton Network has been a capacity constrained network with limited spare capacity. In 2013 the allocation for coal services was 77 paths. In 2015 the expected utilisation for coal services is anticipated to drop to 63 paths (with 46 paths unused) (see Table 1).

Table 1: Utilisation of the West Moreton Network[19]

	Coal	Non-coal	Total used	**Unused**
2013 utilisation	**77**	29	106	**6**
2015 forecast (2015 DAU)	**63**	3	66	**46**
Optimum utilisation	**77**	14	91	**15**

15 Setting the reference tariff at the current level is effectively 'pegging' the access charge to the optimum capacity utilisation price.
16 AEMC (2006), *National Electricity Amendment (Pricing of Prescribed Transmission Services) Rule 2006 No. 22,* Rule Determination, page 2.
17 ACCC (2011), *Pricing principles for price approvals and determinations under the Water Charge (Infrastructure) Rules 2010*, page 53.
18 QCA (2013), *Statement of Regulatory Pricing Principles*, page 12.
19 Due to a constraint from the Queensland government, only 87 out of the 112 paths can be allocated to coal services (77 per cent).

It is in the interests of Queensland Rail that the maximum amount of paths be allocated to coal services and that the commercial viability of its Network is ensured. The optimum utilisation of the West Moreton Network is also presented in Table 1. Without incurring any additional capital or maintenance expenditure, the Rosewood to Jondaryan (R2J) part of the network could cater for 15.7 gross million tonnes (GMT) (up from 11.5 GMT); while the Jondaryan to Columboola part of the network could cater for 3.6 GMT (up from 3 GMT).

Queensland Rail's analysis suggests that this additional volume and decline in coal path allocation (95 per cent to 84 per cent) would result in a ceiling price of $27.91/'000 gtk, or a 20 per cent decline. It is therefore conceivable that the gap between the ceiling price and reference tariff could reduce over time.

The actual tariff structure presented in 2015 DAU is based on a two-part tariff structure with a charge per path and a charge per '000 gtk. This is reflected in the terms of the 2015 DAU. The West Moreton Network tariff is effectively a proxy for the Metropolitan System tariff. The Metropolitan System tariff is set based on the West Moreton System tariff, adjusted to account for incremental capital expenditure for that part of the network.

There is evidence to suggest that the negotiate/arbitrate model is working effectively, with recent access negotiations on the West Moreton Network taking into account the circumstances of the access seeker and provider. In a recent access renewal, the access charge was set at the current rate of $19.14/'000 gtk ($2014-15), suggesting that price stability is commercially appropriate for both parties.

4 Accounting for a reference tariff lower than ceiling

Queensland Rail will bear the risk of volume uncertainty in the short term

A typical characteristic of regulated firms is high fixed costs that are invariant to the level of output; this feature potentially exposes such firms to demand or volume risk.[20] Setting the reference tariff for the West Moreton Network below the ceiling price exposes Queensland Rail to volume risk. There are various examples where regulators, including the QCA, have considered that the risk of demand/volume uncertainty should be borne by the access provider:

- ***Postal services*** – The *Australian Postal Corporation Act 1989* (Cwlth) establishes specific access arrangements for Australia Post's bulk postal services. The ACCC has the power to inquire into disputes about the terms and conditions of access to Australia Post's bulk mail services, including price, and makes a recommendation to the Minister on appropriate terms and conditions. In a recent price notification review, the ACCC considered the uncertainty surrounding longer-term letter volume forecasts. Due to declining volume forecasts, Australia Post under-recovers by approximately 15 per cent each year.[21]
- ***Commercial bulk water services*** – In a recent investigation of prices, the QCA considered Gladstone Area Water Board's exposure to certain downside revenue risk for demand variation through various mechanisms including incorporating reservation volumes within the tariff structures and price differentiation for contract length (to encourage customers to contract).[22]
- ***Metropolitan Water Supply Services*** – In its price review for Metropolitan Melbourne Water, the Essential Services Commission (ESC) sought to achieve a 'reasonable sharing' of demand risks between Melbourne Water and its customers. To this end, ESC provided scope for each business to adjust its tariff strategies or prices to take account of events that do not fall within the business' control. This included significant differences between actual and forecast demand.[23]

The reference tariff should reflect the market conditions faced by end users and replicate what occurs in a competitive market. That is, the willingness and ability to pay of users is an important consideration at the time of recontracting with each access seeker. At the time of renewal of each access agreement, it is in Queensland Rail's best interests to negotiate in accordance with commercial position of each access seeker.

A loss capitalisation policy is not appropriate

There are instances where regulators have determined regulated charges which do not fully recover costs, but where this cost shortfall is carried forward (ie, "capitalised") and recovered in future regulatory periods. A more limited form of loss capitalisation is where regulatory revenue allowances are "smoothed" over the regulatory period, meaning that tariffs may under- or over-recover allowable costs in any one year.

---

20 Network (2014), *Publication of the ACCC for the Utility Regulators Forum*, Issue 44.
21 ACCC (2014), *Australia Post Price notification for its 'ordinary' letter service - Decision*, page 33.
22 QCA (2010), *Final Report Gladstone Area Water Board: Investigation of Pricing Practices*.
23 *Ibid*.

A loss capitalisation approach is appropriate where spare capacity exists or current costs have been incurred but which will benefit future users. In these instances, the regulator may appropriately allow the business to recover its costs over the full 'capacity lifecycle'. This allows charges for today's users to be set reflecting that certain costs may be not immediately recovered, but will be in future periods.

However, a loss capitalisation approach could only be utilised if there is a specific forecast of how volumes will recover over time, and where it can be demonstrated that costs have been efficiently incurred now, to benefit future users (whether through expansions or otherwise). We understand that capitalisation of any losses is not proposed by Queensland Rail at this time as a specific forecast of how (or when) volumes will recover on the West Moreton Network is unknown.

www.pwc.com.au

Appendix 2 – PwC Paper: Asset Valuation for the West Moreton Network

www.pwc.com.au

Asset Valuation of the West Moreton Network

Queensland Rail

Supporting analysis for submission to the QCA

4 May 2015

pwc

Contents

Executive summary

In June 2013, Queensland Rail submitted a draft access undertaking (the 2013 DAU) with a proposed reference tariff of $22.22/'000 gross tonnes kilometres (gtk) for coal users on the West Moreton Network. The tariff was derived using a depreciated optimised replacement cost (DORC) value of **$419.6m** for the relevant network assets, with a methodology for determining the share of this value attributable to coal services.

In its June 2014 Consultation Paper for the 2013 DAU, the Queensland Competition Authority (QCA) did not accept this tariff and instead put forward two alternative options:

- an adjustment of Queensland Rail's DORC assumptions to arrive at a valuation of $427m, again with only a share of this attributed to coal services
- a depreciated actual cost approach.

The QCA received a number of submissions from interested stakeholders on these two valuation options, including one from Queensland Rail disputing the appropriateness of a depreciated actual cost approach. Ultimately, the depreciated actual cost option was dismissed in the QCA's Draft Decision released in October 2014.

The QCA's Draft Decision proposed a tariff of $14.29/'000 gtk, based on stakeholder feedback and a revised DORC valuation of **$246.6m**. QCA's revised DORC valuation approach included placing a zero value on:

- assets built so long ago that, in the QCA's opinion they could be reasonably considered to be fully life expired (e.g. tunnels and earthworks)
- assets that are still in service after their assessed useful lives have expired (e.g. wooden sleepers).[1]

PwC was engaged by Queensland Rail in July 2014 to analyse and comment on the asset valuation methodology proposed by the QCA. Queensland Rail has sought further comment from PwC on certain asset valuation issues including an assessment of the QCA's application of DORC and the treatment of "life expired" assets within a DORC valuation methodology. This report provides supplementary analysis to PwC's July 2014 review and extends on certain asset valuation issues including:

- the appropriate asset valuation methodology for the West Moreton Network
- an assessment of the QCA's application of DORC
- the treatment of life expired assets within a DORC valuation methodology.

In our view, the QCA's proposed approach in its Draft Decision for the 2013 DAU does not appropriately balance the legitimate business interests of Queensland Rail, including the requirement to receive a return on the value of the useful service potential of the asset, and places undue weight on benchmarks from Queensland Rail's accounting treatment of the relevant assets. The QCA's approach to valuing the West Moreton Network is also inconsistent with its own established practice and precedents, as well as precedents from other jurisdictional regulators.

1 Queensland Competition Authority (2014), D*raft Decision on Queensland Rail's 2013 Draft Access Undertaking*, page 139.

The following points summarise our key findings:

1. ***Asset valuation based on DORC methodology is preferred***

   When setting initial asset values, a DORC methodology should be adopted by the QCA for Queensland Rail's West Moreton Network. Australian regulators have overwhelmingly endorsed a DORC approach when valuing assets. The approach is widely regarded as providing the most appropriate estimate of the opportunity cost of the assets employed to deliver services, and therefore supports efficient pricing signals with regard to future investment decisions. We see no compelling reason to depart from this practice for the West Moreton Network.

2. ***The initialisation of the asset value is forward looking***

   The DORC value is consistent with maximum price achievable in a competitive market and the benchmark for efficient pricing and service delivery. The valuation should be constructed from forward-looking benchmarks and information, and historic patterns of asset accounting and development costs are irrelevant. From our assessment of the QCA's DORC valuation, we found several issues with the QCA's approach. A DORC valuation should focus on the remaining service potential of the assets. The 'estimated life' of assets for regulatory purposes should not be based on the accounting treatment of these assets. Regulators over the last two decades have recognised that accounting treatment may be an unreliable proxy for setting the asset value for regulatory purposes. A DORC valuation should reflect the modern equivalent asset value for delivering the same service requirements.

3. ***Asset valuation should be based on delivering the current level of service using modern equivalent assets***

   DORC methodology is about valuing useful service potential of the existing network, and is less concerned with the way the incumbent may account for assets for financial reporting purposes (i.e. what assets may have cost in the past, etc). Accounting treatment may be an unreliable proxy for setting the asset value for regulatory purposes.

4. ***Claims of 'double counting' should be evidenced***

   Key to the QCA's exclusion of certain assets from the DORC valuation is an implied claim that these fully-depreciated assets have already been paid for by users. If the regulator's concern is about *double counting*, then it needs to be evidenced with an analysis demonstrating that past depreciated expenses were actually recovered from past users.

5. ***Arbitrary write downs create asset stranding risk and should be avoided***

   The QCA should also be mindful of the risks of arbitrary write-downs on investment incentives. The risk of regulatory write downs and stranding risk undermine efficiency objectives relating to investment, ultimately to the detriment of service providers and users.

1 Introduction

1.1 Background

Queensland Rail's primary business is the delivery of public transport through the provision of passenger rail services and supporting private freight services through the provision of rail infrastructure. Queensland Rail's intra-state rail network is declared for access under Part 5 of the *Queensland Competition Authority Act 1997* (the QCA Act). It also is subject to the terms of access undertaking approved by the QCA in 2008 (as revised in 2010).

Queensland Rail owns and operates the West Moreton Network which extends from Macalister to the Port of Brisbane. While the entirety of Queensland Rail's intra-state rail network is subject to declaration and the 2008 undertaking, a reference tariff only exists for coal train services on the West Moreton Network.[2] The West Moreton Network tariff is paid by users to Queensland Rail for trains carrying coal from mines on the Darling Downs to the Fisherman Islands export terminal at the Port of Brisbane.

A key consideration as part of setting a ceiling access tariff is the opening asset valuation. The asset valuation usually refers to the measure of the net value of a company's regulated assets used in price regulation. It is used in calculating two important elements of the revenue requirements – the depreciation allowance (return of capital) and the return on capital.

While a tariff has been part of an approved undertaking since 2006, the tariffs have never been calculated from an agreed and settled asset value, nor an agreed underlying set of assumptions in relation to the initial asset value. Significant unresolved issues include the basis on which the costs relating to shared network assets may be apportioned between coal and non-coal services, and the treatment of the metropolitan network, through which coal trains must traverse to reach the Port of Brisbane.

Asset valuation issues must be considered with regard to the functional adequacy of regulated assets, market value, and overall profitability of the regulated business. Equity considerations, including sustainable cash flows of the business, are also an important factor. These considerations form part of the Pricing Principles[3] and approval criteria for access arrangements under the QCA Act.

1.2 2013 Draft Access Undertaking

Queensland Rail submitted a draft access undertaking (the 2013 DAU) to the QCA in June 2013 that included a proposed tariff for the West Moreton Network of $22.22/'000 gtk) in 2013-14.[4] The 2013 DAU proposed a DORC valuation of the West Moreton Network assets of $419.6m.

The QCA Act does not provide any specific guidance on asset valuation or methodology, beyond stating that the expected revenue for the access provider should '*include a return on investment commensurate with the regulatory and commercial risks involved*'.[5] The QCA is required to have regard to wider considerations such as the legitimate business interests of the provider of the services and interest of the users.

In the 2013 DAU Queensland Rail proposed the use of a building block methodology to set tariffs for the West Moreton Network. The use of the transparent and repeatable building block approach, including the establishment of an opening asset value, would provide a degree of revenue/cost certainty going forward, for Queensland Rail and access seekers. It also is a fairly conventional and uncontroversial approach.

---

2 Queensland Competition Authority (2014), *Consultation Paper on Queensland Rail's 2013 Draft Access Undertaking*, page 2.
3 *Queensland Competition Authority Act 1997*, section 168A(a).
4 The current 2014-15 price is $19.14/'000 gtk.
5 *Queensland Competition Authority Act 1997*, section 168A(a).

In response to the 2013 DAU, the QCA released a Consultation Paper in June 2014 which provided two different approaches for calculating the access tariff:

- historical cost option resulting in a price of $13.59/'000 gtk, including placing a zero value on pre-1995 assets
- revised DORC option, resulting in a price of $17.21/'000 gtk, including adjusting the 2009 valuation to reflect an updated assessment of the network's condition with a DORC valuation for the entire West Moreton Network of $427m.

In July 2014, PwC undertook a review of the QCA's basis of asset valuation and the way in which this value may be apportioned between coal/non-coal services for the West Moreton Network reference tariff. This review was provided to the QCA as part of Queensland Rail's submission to QCA's Consultation Paper. PwC provided comment on the methodologies applied by the QCA in its Consultation Paper in reaching the two proposed reference tariffs. PwC concluded that reducing the value of pre-1995 assets is flawed and introduces asset stranding risk.

In October 2014, the QCA's Draft Decision concluded that a tariff of $14.29/'000 gtk was appropriate based on stakeholder feedback and a revised DORC valuation of $246.6m. The QCA's revised DORC valuation approach included:

- placing a zero value on assets (e.g. tunnels and earthworks) built so long ago that they can be reasonably considered to be fully life expired
- placing a zero value on assets (e.g. wooden sleepers) that are still in service after their assessed useful lives have expired, because of ongoing maintenance).[6]

The QCA's Draft Decision for the 2013 DAU does not balance the legitimate business interests of Queensland Rail, including the requirement to receive a return on the value of the useful service potential of the asset. The QCA's approach on the West Moreton Network is also inconsistent with QCA's own established practice and precedents.

1.3 2015 Draft Access Undertaking

Due to significant changes in the business environment and changes to the QCA's regulatory approach, Queensland Rail withdrew the 2013 DAU in December 2014.[7] In order to take into account these changes and ensure that Queensland Rail's access undertaking is fit for purpose, Queensland Rail determined that amendments to the 2013 DAU are required. A revised draft access undertaking (the 2015 DAU) is to be submitted by Queensland Rail to the QCA by 5 May 2015 in accordance with the QCA's initial undertaking notice.

Queensland Rail's 2015 DAU proposes to "decouple" the ceiling tariff the regulator would determine, using conventional building block methods, from the reference tariff that would apply to current and future users. This allows the network valuation to be assessed using generally-accepted regulatory principles based on a building block approach including a DORC methodology, knowing that it does not impact directly the reference tariff that would apply to the West Moreton Network during this regulatory period.

1.4 Disclaimer

This Report has been prepared for Queensland Rail under the terms of our Engagement Contract with Queensland Rail. As an independent report, it has been prepared for Queensland Rail but does not necessarily reflect the views of Queensland Rail.

In preparing this Report we have only considered the circumstances of Queensland Rail. Our Report is not appropriate for use by persons other than Queensland Rail, and we do not accept or assume responsibility to anyone other than Queensland Rail in respect of our Report.

---

6 Queensland Competition Authority (2014), D*raft Decision on Queensland Rail's 2013 Draft Access Undertaking*, page 139.

7 Queensland Rail: 2013 DAU withdrawal letter addressed to Mr Hindmarsh, Chief Executive Officer of QCA, dated 12 December 2014. [http://www.qca.org.au/Rail/Queensland-Rail/More-on-QLD-Rail/Draft-Access-Undertaking/Archive/2013-Draft-Access-Undertaking].

The information, statements, statistics and commentary (together the 'Information') contained in this report have been prepared by PwC from material provided by Queensland Rail, and from other industry data sources external to Queensland Rail. PwC may at its absolute discretion, but without being under any obligation to do so, update, amend or supplement this document.

PwC does not express an opinion as to the accuracy or completeness of the information provided, the assumptions made by the parties that provided the information. PwC disclaims any and all liability arising from actions taken in response to this Report. This Report does not constitute legal advice.

The Information contained in this Report has not been subjected to an Audit or otherwise verified. The information must not be copied, reproduced, distributed, or used, in whole or in part, for any purpose other than as detailed in our Engagement Contract without the written permission of Queensland Rail and PwC.

2 Choosing an appropriate asset valuation methodology

DORC has been widely used in Australia by regulators in both electricity and gas networks and rail networks for the purpose of setting initial asset values

2.1 DORC is consistent with the asset valuation that would apply to an efficient new entrant

Economic principles suggest that regulators should seek guidance from the outcomes of a competitive market in setting efficient decision rules for regulating natural monopoly markets. This implies the use of a valuation that is based upon current replacement costs. DORC allows regulatory pricing to mimic the behaviour of a workably contestable market. The DORC valuation of assets represents the maximum valuation that would prevent system-wide bypass of the relevant assets. The bypass value of assets (forward looking) represents the value that would be consistent with the price charged by an efficient new entrant.

The DORC valuation methodology is consistent with the price charged by an efficient new entrant into an industry, and so is consistent with the price that would prevail in a competitive industry in the long run equilibrium.

DORC is the price that a firm would be prepared to pay for existing assets with their remaining service potential given the alternative of installing new assets (that is, price for utilising existing assets rather than replicating the assets). The DORC method considers the forward looking service delivery of the infrastructure when calculating the replacement cost of the notionally reconfigured assets.[8]

The objective of this methodology is to estimate the value the assets would have based on the value of their replacement cost today - after "optimising" the system to reflect today's best practice technology and depreciating the assets to reflect their remaining economic life.

Thus, the DORC valuation is consistent with the asset valuation that would apply to an efficient new entrant and is, in effect, the value the assets would have if they were employed in a competitive market.[9]

DORC has been widely used in Australia by regulators in both electricity and gas transmission and distribution and rail for the purpose of setting asset values as they have recognised its positive features, including that it:

- involves adopting a generally consistent approach to valuation between regulated and unregulated (competitive) industries
- provides for a consistent valuation treatment of existing and new assets, and will reduce the likelihood that there would be a need for prices to rise as assets are replaced
- would not expose the businesses unduly to the threat of by-pass
- is consistent with the prices charged by an efficient new entrant into an industry or the price that a firm with a given service requirement would pay for existing assets in preference to replicating the assets

8 ACCC (1999), *Statement of Pricing Principles for Transmission Networks*, page 39.
9 Office of the Regulator General Victoria (1998), *Final Decision for Access Arrangements for MultiNet Energy*, Westar and Stratus, page 12.

- is indicative of the maximum price a new entrant firm would pay to buy the existing assets as opposed to replacing them with new assets.[10]

2.2 Regulatory precedents for using DORC when setting the initial asset value is strong

DORC is widely regarded to provide the most accurate estimate of the opportunity cost of the assets employed to deliver the services, and therefore provides efficient ceiling pricing signals with regards to future investment decisions.

Regulatory precedent overwhelmingly supports the application of DORC methodology in order to value assets owned by regulated businesses. The QCA has been a prominent advocate for the DORC valuation method in the past, utilising it to value asset bases for numerous regulated entities including Queensland Rail, Dalrymple Bay Coal Terminal (DBCT) Management, Gladstone Area Water Board, SunWater, Energex and Ergon. As highlighted by the QCA, the major advantage of using DORC is that it addresses the incompatibility between historical values of capital assets and current values for other expenses and revenues.[11]

A summary of the extent to which a DORC methodology is preferred by regulators is provided in Table 1.

Table 1 Summary of methodologies for setting initial asset values

Asset class	Regulator	Network	Methodology
Electricity Transmission Networks	ACCC/AER	TransGrid (NSW), Powerlink (QLD), Electranet (SA), SP AusNet (VIC), TransEnd (Tas)	DORC
Electricity Distribution Networks	ESC (VIC)	Solaris Power, CitiPower, Powercor, Eastern Energy, United Energy	Asset value > DORC
Electricity Distribution Networks	ESCOSA (SA)	ETSA Utilities	DORC
Electricity Distribution Networks	IPRC (ACT)	ActewAGL	DORC
Electricity Distribution Networks	IPART (NSW)	Energy Australia, Integral, Country Energy	DORC
Electricity Distribution Networks	QCA (QLD)	Energex, Ergon	DORC
Electricity Distribution Networks	OTTER (TAS)	Aurora	DORC
Gas Transmission Pipelines	ACCC/AER	Moomba to Sydney Pipeline, Moomba to Adelaide, Amadeus Basin to Darwin pipeline, Roma to Brisbane Pipeline, Central West Pipeline	DORC
Gas Transmission Pipelines	OffGAR / ERA (WA)	Damper to Bunbury Natural Gas Pipeline, Goldfields Gas Pipeline	Asset value > DORC
Gas Transmission Pipelines	ORG/ESC (VIC)	MultiNet	DORC
Gas Transmission Pipelines	ESCOSA (SA)	Envestra	DORC
Gas Transmission Pipelines	QCA (QLD)	Envestra, Allgas	DORC
Ports Infrastructure	QCA (QLD)	Dalrymple Bay Coal Terminal	DORC
Rail Infrastructure	QCA (QLD)	Queensland Rail National	DORC
Rail Infrastructure	IPART	Australian Rail Track Corporation	DORC

10 Office of the Regulator General Victoria (1998), *Final Decision for Access Arrangements for MultiNet Energy*, Westar and Stratus, page 13.

11 Queensland Competition Authority (2001), *Determination for Electricity Distribution Networks*, page 57.

3 Assessing the QCA's application of DORC

Economic theory suggests that the asset value should be based on delivering the current level of service using modern equivalent assets

3.1 DORC should be forward looking

Due to the threat of bypass, the initial asset value should be set with reference to the replacement cost of the most efficient configuration of assets needed to deliver the customers' service requirements. DORC provides an estimate of the current cost of replacing an asset with one which can provide the required services potential in the most efficient way.

The determination of an appropriate initial asset value for a particular set of assets is a pragmatic determination, with the most appropriate valuation determined by consideration of the particular circumstances of the regulated business and the outcome of the valuation. This has been evident in regulatory valuations of utility assets wherein regulators have given consideration to the reasonable expectations and legitimate business interests of the owners of the regulated assets prior to the determination of regulatory values.

The initial value of the assets should reflect the future service potential of the asset. How assets were funded, what they cost originally and whether assets are fully depreciated for accounting purposes is a secondary, and potentially irrelevant, consideration.

For the West Moreton Network, relevant factors to take into account in determining the asset value include the ***utility of the infrastructure*** and the ***quality of service***. As the QCA acknowledges in its Draft Decision for the 2013 DAU, many of the historic assets of the West Moreton Network remain relevant for operating coal services today.[12]

The difference between economic life and technical life of an asset has been articulated in a number of regulatory forums. For example, the Australian Competition and Consumer Commission (ACCC) in its 1999 draft statement of regulatory principles for transmission networks stated the useful life of the asset will be dependent on the period over which the services it provides will be needed:

> *The useful economic life of an asset may have very little to do with the feasible technical life of the equipment. It may be more dependent on the period over which the services it provides will be needed.*[13]

The rationale for using DORC to value assets is that it provides a greater indication of the opportunity cost to the owner of the asset and is therefore more consistent with the value of the asset in a competitive market. However, the valuation of historical assets at zero, effectively assigning a value less even than ***scrap value***, fails to provide incentives for the efficient management of assets or for future investment. Valuing 'useful' assets at zero is inconsistent with commercial practices and ignores the true value of the assets and the corresponding services they provide.

Firms will be reluctant to remain in a market if returns derived are insufficient to cover the regulatory and commercial risks involved with the infrastructure. This can be true if firms can realise more value from selling their assets than from their continual use. Accordingly, financing of new assets will also become difficult if regulated prices are not set according to replacement costs, and particularly so if regulatory valuations are reduced such that tariffs derived from them fall considerably from current levels of recovery.

The regulator should only set a lower value for existing assets if there is a difference in quality of service able to be provided by a new asset, or where to value the assets otherwise

12 Queensland Competition Authority (2014), D*raft Decision on Queensland Rail's 2013 Draft Access Undertaking*, page 119.
13 ACCC (1999), *Statement of Principles for the regulation of Transmission Revenues*: Draft, page 46.

would render the service unaffordable to users (and hence result in no services being provided). Notably, valuing assets using a DORC methodology ensures an asset value that is:

- adjusted for the proportion of the services potential of the existing asset that has expired
- optimised to provide the required service potential in the most efficient way possible.

If the regulator's concern is one of *affordability*, then this ought to be expressed explicitly. It should not influence the way in which the primary valuation is constructed.

Queensland Rail's approach in the 2015 DAU of 'decoupling' the ceiling price and the reference tariff allows the ceiling price for the West Moreton coal services to be assessed using generally-accepted regulatory principles based on a building block approach. Setting the reference tariff below the ceiling price, then takes into consideration what reasonably can be recovered from West Moreton Network users.

3.2 Depreciation is applied to reflect the service potential of the asset

DORC methodology uses a modern equivalent asset value for delivering the required level of service. Depreciation is applied over time to reflect the decline in service potential of the asset and the asset value is then optimised to ensure that only assets relevant to future demand are included. The optimisation process attempts to **remove excess capacity and redundant services** from the value of the asset base. This method establishes values using the most efficient configuration of assets needed to deliver the regulated services. DORC recognises that the remaining service life of the existing assets may be limited and as such, depreciates the replacement cost to reflect the current state of the existing assets.

The purpose of adjusting for depreciation in the DORC valuation is to derive the value for an old asset that will create the same total cost structure as that of a new asset. A depreciation step in the DORC valuation seeks to estimate the present value difference between the future costs of a new asset, relative to the existing network. This step aims to capture differences in future operating and maintenance costs as well as future renewal/replacement programs, both of which are affected by the age of the existing assets.

The depreciation adjustment in the DORC valuation properly is about the difference in forward looking costs of an old asset relative to a new one. As such, straight line depreciation is simply a proxy and may be inaccurate in many cases.

In 2004, East Australian Pipeline Limited submitted an application to the Australian Competition Tribunal (the Tribunal), regarding the ACCC's draft access arrangement for the Moomba to Sydney Pipeline System. In this decision, the Tribunal considered the critical role of the depreciation step in the DORC valuation:

> *DORC arrives at a hypothetical value and looks forward. The starting point to ascertain DORC is to arrive at the ORC (which costs the hypothetical optimised replacement of the pipeline) and then depreciates that amount to what might be called a second hand value, principally because the optimised pipeline would last longer than the existing.* [14]

14 *Application by East Australian Pipeline Limited* [2004] ACompT 8, para 18.

The Tribunal also expressed strong reservations about the use of accounting concepts of depreciation for the purpose of a DORC valuation, particularly straight line depreciation:

> *DORC is a forward looking concept and the 'depreciation' concerned is economic deprecation. There is no support for the valuation to be adjusted to take account of past events particularly based upon accounting concepts of depreciation, and to do so is wrong in principle.*[15]

The Tribunal's decision over a decade ago, recognised that economic theory underpinning the DORC recognises that a simplistic age-based depreciation profile is not appropriate, particularly one that references financial and accounting reporting values which may not bear any resemblance to the asset's condition or remaining useful life.

3.2.1 Departures from financial reporting depreciation terms in regulatory valuations

A summary of the instances where regulators, including the QCA, have reflected the 'usefulness' of the assets during a valuation is provided below.

Electricity Networks – Queensland

As part of Ergon Energy's 2005 electricity distribution price review, the standard asset lives for various asset classes was redefined in 2003. The asset lives accepted by the QCA in 2003 represented a general *increase* over the lives used in the 1999 Queensland electricity distribution valuation. A comparison of the standard life increases is summarised in Table 2.

Table 2 Comparison of asset lives for Ergon Energy between 1999 and 2003

Asset category (years)	1999 valuation	2003 valuation	Change
132kV steel tower transmission line	50	60	+ ***20%***
132kV concrete pole transmission line	50	55	+ ***10%***
66kV/33kVconcretepole lines	50	55	+ ***10%***
11/22kV overhead (concrete)	45	55	+ ***22%***
Low voltage overheads – concrete	45	55	+ ***22%***

Source: Queensland Competition Authority, Ergon Energy, Electricity Distribution Price Review 2005, page 226

The QCA in this decision, increased the standard asset lives to reflect the current experience and opinion within the electricity supply industry as to the remaining useful life of those assets. The asset lives were extended by a range of 10 to 22 per cent. As part of this valuation, the QCA also accepted a minimum remaining life for assets still in service beyond their standard life.[16] This recognised the continuing value of assets which, irrespective of previous asset accounting, would still provide a useful service to the network. In the 2003 valuation a three to five year minimum life was adopted depending on the asset type.

When the initial regulatory asset base was set for Ergon Energy's network, the implied accounting depreciation rate was greater than the approved regulatory depreciation rate (6.3% and 5.2% respectively) in 2005. The QCA in its 2005 determination, did not base the asset life for regulatory depreciation on the accounting asset life (using 19.2 years compared to 15.8 years respectively).

15 *Application by East Australian Pipeline Limited* [2004] ACompT 8, para 26.
16 Queensland Competition Authority (2005), *Ergon Energy, Electricity Distribution Price Review*, page 226.

Electricity Networks – Victoria

The valuations for each of the five electricity distribution networks in Victoria were all set around the time of privatisation of those utilities.[17] In 1994 the National Performance Monitoring Subcommittee of the Industry Commission concluded that asset values should be based on the replacement cost of the services or benefits currently embodied in the asset.[18] The Industry Commission also acknowledged that deprecation for taxation and accounting purposes will be different to depreciation for regulatory purposes due to variances in asset life and asset usage.

The opening asset values for each Victorian electricity distribution business were outlined in the *Electricity Supply Industry Tariff Orde*r, dated Friday 30 June 1995.

Table 3 Asset valuation of electricity networks in Victoria[19]

Asset ($m)	ORC Value	Adjustment	Regulatory Value
CitiPower	$482	$129	**$611**
Eastern Energy	$1046	($218)	**$828**
Powercor	$1227	($161)	**$1066**
Solaris Power	$361	$61	**$422**
United Energy	$743	$136	**$879**

As part of this valuation some components of electricity networks were provided with a nominal value, despite being fully depreciated to take into account the service provided by the assets. As such the regulatory life assigned to these assets was greater than the accounting treatment, in order to incentivise the efficient investment in, and operation of these assets.[20]

Based on the replacement cost and the adjustment for urban/rural price cross subsidies, the asset values for three networks were set above the DORC value, while the two others were set below the DORC.

Water infrastructure – Queensland

The QCA, when recommending that the Gladstone Area Water Board's (GAWB) assets be valued using DORC, considered the demand of the assets including the service potential during the optimisation process.[21] The QCA recognised that a DORC should be used for establishing asset values as a basis for setting maximum prices for customers as the replacement cost, 'more closely approximates the actual cost of a new entrant in the market, thereby more closely replicating the outcomes that might be expected from a competitive market'.[22]

In its Final Report, in determining the asset base the QCA set the remaining asset lives of GAWB's assets in line with the design lives of replacement assets. In effect the remaining asset life for regulatory purposes was higher than the asset life used for accounting purposes.[23]

17 Council of Australian Governments Communiqué (1994), *Attachment A - Report on Electricity Reform*, 19 August.
18 Industry Commission – Steering Committee on National Performance Monitoring (1994), *Guidelines on Accounting Policy for Valuation of Assets of Government Trading Enterprises*, page 3.
19 Institute of Public Affairs (1999), *Energy Issues Paper No. 11*, Submission to the ORG on the 2011 Price Review.
20 Institute of Public Affairs (1999), *Energy Issues Paper No. 11*, Submission to the ORG on the 2011 Price Review.
21 Queensland Competition Authority (2005), *Final Report Gladstone Area Water Board: Investigation of Pricing Principles.*
22 Queensland Competition Authority (2002), *Gladstone Area Water Board: Investigation of Pricing Practices – Final Report*, page 44.
23 Queensland Competition Authority (2002/2005), Gladst*one Area Water Board: Investigation of Pricing Practices – Final Report.*

In the case of the asset valuations for the Burdekin River Irrigation Area, the QCA provided an asset value to 'life expired assets'. Life expired assets were given a value greater than zero as to:

- provide management with the incentive to enhance shareholder value
- provide an incentive for the better management of assets or for future investment
- be consistent with efficient outcomes that would prevail in a competitive market
- be consistent with normal commercial practices.[24]

Dalrymple Bay Coal Terminal

The QCA in its Final Decision for the DBCT Draft Access Undertaking in 2006 set an asset value of $850m based on a DORC valuation including:

> *adopting fundamentally the same terminal configuration as presently used, with optimisation to ensure that only assets relevant to provide the desired level of service provision are incorporated.*[25]

The QCA also concluded that depreciation in a DORC context should not simply write-down the value of an asset to reflect its age, but it should reflect the serviceability of the assets.[26]

In its Final Decision for the DBCT Draft Access Undertaking, the QCA adopted a 50-year constraint on assets based on the conclusion that a straight-line depreciation was not appropriate. The QCA concluded that this evenly balanced the potential risks of asset stranding between DBCT and terminal users.

Queensland Rail National

In 2001 the QCA set the asset valuation for Queensland Rail National's coal-carrying rail infrastructure including land assets as part of its Draft Access Undertaking. As part of this decision, the QCA considered that it was not appropriate to value assets at zero, as this would 'undermine the incentives to invest in the network'.[27] The QCA also concluded that the historical cost would substantially understate the opportunity costs imposed on society of the existence of the network, particularly as some of the assets of the network were acquired over a century ago.[28]

---

24 Queensland Competition Authority (2003), *Burdekin Haughton Water Supply Scheme: Assessment of Certain Pricing Matters relating to the Burdekin River Irrigation Area*, Draft Position Paper No.3 – Asset Valuations, page 4.
25 Queensland Competition Authority (2004), *Dalrymple Bay Coal Terminal Draft Access Undertaking, Draft Decision,* page 122.
26 Queensland Competition Authority (2004), *Dalrymple Bay Coal Terminal Draft Access Undertaking, Draft Decision*, page 157.
27 Queensland Competition Authority (2001), *Final Decision on QR's 2001 Draft Access Undertaking*, page 366.
28 Queensland Competition Authority (2001), *Final Decision on QR's 2001 Draft Access Undertaking*, page 366.

4 Recovery of sunk costs

The 'line in the sand' approach should only be used if the business would be expected to have been setting its prices so as to provide it with a reasonable opportunity of recovering the cost of its sunk asset

4.1 Opportunity to recover costs

The initial asset value should be broadly consistent with each supplier having earned at least a normal return in the past. The relevance of historical cost recovery to asset valuations was commented on by the NZ Commerce Commission, which stated that 'ensuring broader consistency with normal returns over the life of the asset is important when establishing the initial value of the asset value'.[29]

DORC should only be adjusted to ensure that assets that cease to contribute in any way to the delivery of the services are removed from the asset base. If this is not the case (that is, assets continue to contribute to the delivery of the services), an adjustment (or scrap value) is not required.

In the case of access arrangement for the Central West Pipeline, when setting the asset base value, the ACCC considered the basis on which tariffs have been (or appear to have been) set in the past and the historical returns to the service provider from the covered pipeline.[30]

The QCA's Draft Decision for the West Moreton Network reference tariff placed a zero value on assets whose actual life exceeded their 'expected useful life'. The QCA has explicitly concluded that assets in place for longer than their 'expected useful life', have been fully depreciated over time, and to include them in the asset valuation would amount to 'double counting'.[31]

The QCA's Draft Decision presupposes that past charges have been set at full cost recovery. Otherwise, even though assets may have been fully depreciated, this depreciation expense may not actually have been recovered from past users. Thus, the regulator needs to consider contextual factors such as investor expectations and the extent of previous cost recovery etc.

The QCA's claim that, because assets are fully depreciated in an accounting context, that they have already been paid for, relies on a core assumption that charges over the asset life have been set at full cost recovery. Given the nature of the assets of the West Moreton Network, this is very unlikely. Most importantly, to the extent that full cost recovery has not been achieved, depreciation may not have been fully recovered.

The QCA in its Draft Decision for the 2013 DAU, released in October 2014, refers to its previous decision of setting zero value on 'life expired' assets for the gas distribution networks in 2001.[32] However, we note that the QCA in making this decision, considered that the use of a minimum life of these assets would provide the gas distributors with a windfall gain, due to the way that tariffs had been set in the past.[33] As mentioned above, given the nature of the assets of the West Moreton Network, this is very unlikely.

---

29 NZ Commerce Commission, *Input Methodologies Paper*, page 138.
30 ACCC (2000), *Final Decision, Access Arrangement by AGL Pipelines (NSW) Pty Ltd for the Central West Pipeline*, page 52.
31 Queensland Competition Authority (2014), *Draft Decision on Queensland Rail's 2013 Draft Access Undertaking*, page 119.
32 Queensland Competition Authority (2014), *Draft Decision on Queensland Rail's 2013 Draft Access Undertaking*, page 138.
33 Queensland Competition Authority (2001), *Proposed Access Arrangements for Gas Distribution Networks: Allgas Energy Limited and Envestra Limited*, page 148.

4.2 Risk of arbitrary write downs

Once properly determined, the regulatory asset base represents the value of unrecovered past capital investments made by the existing and past infrastructure owners. Assets that form part of the regulatory base are subject to the risk of regulatory 'asset stranding' where regulators determine to reduce this asset value. The degree of this risk will affect the cost of financing the regulated firms new and existing investments, since the regulatory treatment of past capital investment is the best objective information available to investors on how current investments are likely to be treated over their lives.[34]

The disadvantages of this risk include:

- distortion of the patterns of investment
- the introduction of additional costs, disputes and complexity in the regulatory process
- the non-recovery of investments that were prudently made on the basis of the best available information.

The risk of regulatory write downs and stranding risk undermine efficiency objectives to the detriment of service providers and users. Given these considerations the QCA must evidence the claims of double counting and be mindful of the risk of arbitrary write-downs on investment incentives.

Queensland Rail's approach of decoupling the ceiling price from the reference tariff provides a mechanism to ensure that this risk is minimised, whilst considering the temporary affordability constraints of access holders.

34 Network (2014), *Assessing Proposals for Regulatory Write-downs*, Utility Regulatory Forum, Issue 53.

www.pwc.com.au

Appendix 3 – West Moreton Reference Tariff 2015 DAU Capital Submission

Appendix 3

West Moreton Reference Tariff
2015 DAU
Capital Submission
(May 2015)

Table of Contents

Introduction

The current access undertaking, titled 'QR Network's Access Undertaking (2008) June 2010' (2008AU), was assigned to Queensland Rail via a Transfer Notice on 1 July 2010 as part of the separation of QR Limited into Aurizon (formerly QR National) and Queensland Rail.

The Queensland Competition Authority (QCA) has formally requested that Queensland Rail provides its own access undertaking, titled 'Queensland Rail's Access Undertaking 1' (2015 DAU). As part of the development of the 2015 DAU, Queensland Rail has undertaken to develop a reference tariff for the West Moreton Network. The reference tariff developed will "reset" the existing reference tariff that has applied under the 2008AU and is proposed to apply from 1 July 2015 to 30 June 2020.

This submission provides insight into capex undertaken and proposed to be undertaken on the West Moreton Network (the rail corridor bounded by Rosewood to the east and Miles to the West).

This document separates capex into two main parts being:

- Pre 2015 DAU capex, carried out between 2013/2014 to 2014/2015; and
- 2015D AU capex, proposed to be carried out between 2015/2016 to 2019/2020 and corresponding to the term of the reference tariff reset.

For each project a distinction has been made for works performed between:

- Rosewood - Jondaryan and
- Jondaryan - Columboola

This document should be read in conjunction with the current "Asset Management Plan" (AMP) for the West Moreton Network. This AMP outlines the Network's characteristics, traffic types, business environment, key drivers and details the high level asset descriptions and strategies by which the system is managed. From these strategies the capital plans as detailed within this document are created.

Also of significant note is the tie in the AMP has with the 2014 implementation of Queensland Rail's first Enterprise Asset Management System. This system enables Queensland Rail to better understand and monitor the actual condition and degradation of its networks assets (hence creating greater visibility of future capital upgrade requirements). Although still in its infancy this is a big step forward which will revolutionise the way our future plans will be developed.

Pre 2015 DAU Capex (2013/14 to 2014/15)

The following tables and project summaries outline capex undertaken prior this submission and data provided since the previously submitted (and retracted) reference tariff submission. At the time of this submission there are a number of projects still in the implementation stage hence forecasted data has been provided for Q4 2014/2015.

Past Capital 2012/13 – 2014/15 (projected to June 30, 2015)

B number	Number	Project	Corridor	2013/14	2014/15	Total
B.03656.	**1**	WSAR	Rosewood - Jondaryan	[redacted]	[redacted]	$15,182,307
			Jondaryan - Columboola	[redacted]	[redacted]	
B.04018.	**2**	Malu Extension	Rosewood - Jondaryan	[redacted]	[redacted]	$924,291
			Jondaryan - Columboola	[redacted]	[redacted]	
B.04042.	**3**	Toowoomba Range Stabilisation	Rosewood - Jondaryan	[redacted]	[redacted]	$888,521
B.04043.	**4**	West Moreton Timber Bridge Upgrades	Rosewood - Jondaryan	[redacted]	[redacted]	$3,101,842
			Jondaryan - Columboola	[redacted]	[redacted]	
B.04044.	**5**	Formation Strength - West Moreton	Rosewood - Jondaryan	[redacted]	[redacted]	$7,178,620
			Jondaryan - Columboola	[redacted]	[redacted]	
B.04045.	**6**	Bridges To Culverts	Rosewood - Jondaryan	[redacted]	[redacted]	$155,699
			Jondaryan - Columboola	[redacted]	[redacted]	
B.04046.	**7**	Drain Upgraded West Moreton	Rosewood - Jondaryan	[redacted]	[redacted]	$1,065,000
			Jondaryan - Columboola	[redacted]	[redacted]	
B.04047.	**8**	Check Rail Curves	Rosewood - Jondaryan	[redacted]	[redacted]	$4,028,031
B.04075.	**9**	Level Crossing Compliance - Regional	Rosewood - Jondaryan	[redacted]	[redacted]	$370,000
			Jondaryan - Columboola	[redacted]	[redacted]	
B.04142.	**10**	Forest Hill Timber Bdge Replace.	Rosewood - Jondaryan	[redacted]	[redacted]	$2,495,743
B.04207.	**11**	Isaac St	Rosewood - Jondaryan	[redacted]	[redacted]	$97,954
B.04196.	**12**	Siemens Axle Counters	Rosewood - Jondaryan	[redacted]	[redacted]	$1,418,000
B.04198.	**13**	LEDR Radio system replacement	Rosewood - Jondaryan	[redacted]	[redacted]	$163,422
			Jondaryan - Columboola	[redacted]	[redacted]	
B.04055.	**14**	Train Radio Network Replacement Project	Rosewood - Jondaryan	[redacted]	[redacted]	$295,000
			Jondaryan - Columboola	[redacted]	[redacted]	
B.04163.	**15**	Corridor and Asset Protection	Rosewood - Jondaryan	[redacted]	[redacted]	$587,973
			Jondaryan - Columboola	[redacted]	[redacted]	
	Total			**$13,389,331**	**$24,563,072**	**$37,952,402**

Pre 2015 DAU Projects

1. Western System Asset Replacement

Project Cost ($'000): $15,182 (excl. Capitalised Interest)

This project commenced in 2006/07. The total project cost from 2013/14 to the end of 2014/15 FY will be $15,182,307.

Timelines:
Construction: 2006/07 to 2015/16

Project Name	Corridor	2013/14 ($'000)	2014/15 ($'000)	Total ($'000)
WSAR	Rosewood to Jondaryan	[redacted]	[redacted]	[redacted]
	Jondaryan to Columboola	[redacted]	[redacted]	[redacted]

Description of Project and Benefits:

Project Scope:
The objective of this project was to improve reliability and increase the longevity of the West Moreton Network. This involved the upgrade of 31.052km of track to 50kg rail on concrete sleepers, the replacement of 18 turnouts, upgrading them to 60kg steel on concrete sleepers and the removal of eight other turnouts and replacing with straight track, e.g. siding closure.

Project Benefits:
- Improve the reliability of track through a reduction in track under speed restriction and below rail delays.
- Reduces the likelihood of broken rail derailments, thereby improving safety.
- Reduces exposure to service defects which require shutdowns to remove defective rail and expensive welding in and match grinding of the inserted closure rails.
- Reduces maintenance requirements in rail joint management.

All Traffics / Coal Specific:
The works that comprised this project were undertaken specifically to benefit coal carrying customers on the West Moreton Network.

Delivery Provider:
All works undertaken have been delivered by internal Queensland Rail resources.

Contact Officer:
Project Manager.

2. Malu Loop Extension

Project Cost ($'000): $924.3 (excl. Capitalised Interest)

Timelines:

Construction: 2013/14

Project Name	Corridor	2013/14 ($'000)	2014/15 ($'000)	Total ($'000)
Malu Loop Extension	Rosewood to Jondaryan	[redacted]	[redacted]	[redacted]
	Jondaryan to Columboola	[redacted]	[redacted]	[redacted]

Description of Project and Benefits:

Project Scope:
This project included the extension of the loop at Malu to allow trains to be parked in the loop without blocking the quarry level crossing. The loop extension consisted of extending both tracks by 400 meters east towards Toowoomba. The existing turnout was relocated east and concrete sleepered track was built in the extension.

Project Benefits:
Allowed trains to be stored in the Malu Loop without blocking the quarry level crossing.

All Traffics / Coal Specific:
The works that comprise this project will be undertaken to benefit all users of the West Moreton Network.

Delivery Provider:
All works undertaken have been delivered by internal Queensland Rail resources.

Contact Officer:
Project Manager

3. Toowoomba Range Stabilisation

Project Cost ($'000): $888.5 (excl. Capitalised Interest)

Timelines:

Planning and Investigation: 2013/14 to 2014/15

Project Name	Corridor	2013/14 ($'000)	2014/15 ($'000)	Total ($'000)
Toowoomba Range Stabilisation	Rosewood to Jondaryan	[redacted]	[redacted]	[redacted]
	Jondaryan to Columboola	[redacted]	[redacted]	[redacted]

Description of Project and Benefits:

Project Scope:
This project involved monitoring and repairing locations along the length of the Toowoomba Range particularly locations where access roads are showing signs of movement through longitudal tension cracking. Works included the planning and investigation of stabilisation of high and steep slopes directly adjacent to the access road and rail corridor through the installation of rock walls, widening of vehicular access road, and removal of mud holes beneath the track structure. Site inspections were conducted with Golders Associates, whose continued advice forms the basis of this project scope.

Project Benefits:
Reduced risk of major landslips during inclement weather with the benefits of avoiding such landslips including (but not limited to):

- Reduced risk of derailments, and associated injuries.
- Reduced risk of service delays and/or lost revenue.
- Reduced risk of access road failure, and associated potential injuries, vehicle damage, and productivity losses due to lack of site access.
- Implementing slope stabilisation as a preventative measure will result in better long term outcomes for users of the West Moreton Network.

All Traffics / Coal Specific:
The works that comprise this project will be undertaken to benefit all users of the West Moreton Network.

Delivery Provider:
Work for this project will be undertaken by an external contractor managed by Queensland Rail.

Contact Officer:
Project Manager

4. West Moreton Timber Bridge Upgrades

Project Cost ($'000): $3,101 (excl. Capitalised Interest)

Timelines:

Planning and Construction: 2013/14 to 2014/15

Project Name	Corridor	2013/14 ($'000)	2014/15 ($'000)	Total ($'000)
West Moreton Timber Bridge Upgrades	Rosewood to Jondaryan	[redacted]	[redacted]	[redacted]
	Jondaryan to Columboola	[redacted]	[redacted]	[redacted]

Description of Project and Benefits:

Project Scope:
Elimination of three timber bridges on the coal corridor between Rosewood and Jondaryan by replacement with culverts. Reinstatement of associated trackwork is included with design remaining on current alignment. To date investigation and planning works have been completed with construction due to start late 2014/15 and be completed by end of 2015/16.

Timing	Location	Comment
2015/16	84.000km ML UP & DN	Leaning piers, trains pushing piers over, temporary support.
2015/16	83.190km ML UP & DN	Leaning piers, trains pushing piers over.
2015/16	83.930km ML UP & DN	Replaced with one structure combining 84km and 83.930km.

Project Benefits:
- Reduces maintenance costs associated with component degradation/replacement.
- Reduces exposure to old technology and labour intensive practices.
- Reduces exposure to defect and related speed restrictions on bridges and approaches.

All Traffics / Coal Specific:
The works that comprise this project will be undertaken specifically to benefit coal carrying customers on the West Moreton Network.

Delivery Provider:
An external contractor under the management of Queensland Rail will be engaged to complete this project except for the track work which will be undertaken by Queensland Rail.

Contact Officer:
Infrastructure Planning Manager West.

Image 1: Bridge to be replaced at the 84.000km

5. Formation Strengthening - West Moreton

Project Cost ($'000): $7,178.6 (excl. Capitalised Interest)

Timelines:

Construction: 2013/14 to 2014/15

Project Name	Corridor	2013/14 ($'000)	2014/15 ($'000)	Total ($'000)
Formation Strengthening West Moreton	Rosewood to Jondaryan	[redacted]	[redacted]	[redacted]
	Jondaryan to Columboola	[redacted]	[redacted]	[redacted]

Description of Project and Benefits:

Project Scope:
Repairing formation failure, mud holes and ballast pockets throughout the West Moreton Network. A total of 12 km has been achieved during the 13/14 and 14/15 FY costing $532/meter. Currently within Queensland Rail's EAMS database there is 20.8km of formation requiring attention with priorities ranging between 30 days to 5 years.

Project Benefits:
Reduces ballast contamination as well as top and line deterioration which causes speed restrictions and ultimately derailments.

All Traffics / Coal Specific:
The works that comprise this project will be undertaken specifically to benefit coal carrying customers on the West Moreton Network.

Delivery Provider:
Queensland Rail will remove and replace rail assets as well as manage formwork rehabilitation undertaken by an external contractor.

Contact Officer:
Infrastructure Planning Manager West

Image 2: Poor formation on the West Moreton Network

6. Bridges to Culverts

Project Cost ($'000): $155.7 (excl. Capitalised Interest)

Timelines:

Planning: 2013/14 to 2014/15

Project Name	Corridor	2013/14 ($'000)	2014/15 ($'000)	Total ($'000)
Bridge to Culverts	Rosewood to Jondaryan	[redacted]	[redacted]	[redacted]
	Jondaryan to Columboola	[redacted]	[redacted]	[redacted]

Description of Project and Benefits:

Project Scope:
This project involves the replacement of seven timber/steel bridges and flood openings with reinforced concrete box culverts between Rosewood and Columboola. Priorities are based on the condition and residual structural capacity of the existing structures. The works include replacement of former bank end material, installation of new cover material with compacted selected geosynthetic reinforced soil and reinstatement of open track work. Current works have seen planning and investigations completed. Replacement works will be done during the 15/16 and 16/17 FY. Structures to be replaced are as follows:

Location	Km	Existing Structure	Description of Work
Oakey to Jondaryan	39.950km	Timber Bridge	Replace with RCBC
Jondaryan to Dalby	63.040km	Timber Bridge	Replace with RCBC
Jondaryan to Dalby	46.900km	Timber Bridge	Replace with RCBC
Jondaryan to Dalby	47.410km	Timber Bridge	Replace with RCBC
Macalister to Columboola	111.380km	Steel - Flood Opening	Replace
Macalister to Columboola	113.190km	Steel - Flood Opening	Replace

Project Benefits:
- Reduces the risks associated with working on bridges.
- Reduces costs associated with maintenance and eliminates labour intensive work practices.
- Reduces exposure to defect and work related speed restrictions.

All Traffics / Coal Specific:
The works that comprise this project will be undertaken specifically to benefit coal carrying customers on the West Moreton Network. The project would otherwise not be required to be delivered within the four year 2015 DAU period.

Delivery Provider:
An external contractor under the management of Queensland Rail will be engaged to complete this project except for the track work which will be undertaken by Queensland Rail.

Contact Officer:
Infrastructure Planning Manager West

7. Drain Upgrade West Moreton

Project Cost ($'000): $1,065 (excl. Capitalised Interest)

Timelines:

Planning: 2013
Construction: 2014/15

Project Name	Corridor	2013/14 ($'000)	2014/15 ($'000)	Total ($'000)
Drain Upgrades	Rosewood to Jondaryan	[redacted]	[redacted]	[redacted]
	Jondaryan to Columboola	[redacted]	[redacted]	[redacted]

Description of Project and Benefits:

Project Scope:
Replacing drains affected by calcium chloride reaction in priority order. Three drains require replacement on the following corridors:

- 3 x drains on the Western Line 55.270km, 55.280km and 56.180km.

Project Benefits:
Replacing drains affected by calcium chloride reaction will reduce the risk of culvert failure which would result in transit time delays and/or derailments.

All Traffics / Coal Specific:
The works that comprise this project will be undertaken to benefit all users of the West Moreton Network.

Delivery Provider:
An external contractor under the management of Queensland Rail will be engaged to complete this project except for the track work which will be undertaken by Queensland Rail.

Contact Officer:
Project Manager

8. Concrete Sleeper Check Rail Curves

Project Cost ($'000): $4,028 (excl. Capitalised Interest)

Timelines:

Construction: 2013/14 and 2014/15

Project Name	Corridor	2013/14 ($'000)	2014/15 ($'000)	Total ($'000)
Toowoomba Range Stabilisation	Rosewood to Jondaryan	[redacted]	[redacted]	[redacted]
	Jondaryan to Columboola	[redacted]	[redacted]	[redacted]

Description of Project and Benefits:

Project Scope:
8.949kms of timber sleepered check rail curves on the Toowoomba (7.895km) and Little Liverpool (1.055km) Ranges are planned to be relayed. The relay will provide new 50kg head hardened rail and 33C1 check rail on an inclined boltless check rail baseplate on concrete sleepers and fresh ballast. The track is to be installed on a designed and monumented alignment at a stress free neutral temperature of 38 degrees celcius. Curves completed to the end of 14/15 include:

- ML Curve 156.267km 98 meters
- ML Curve 154.165km 92 meters
- ML Curve 153.369km 216 meters
- ML Curve 155.024km 154 meters
- ML Curve 154.257km 274 meters
- Loop Curve 139.577km 288 meters
- ML Curve 145.701km 110 meters
- ML Curve 143.283km 297 meters
- ML Curve 140.405km 150 meters
- ML Curve 140.800km 169 meters

Project Benefits:

- Improves reliability of this heavily used section, hence reducing derailment likelihood.
- Improves track geometry and reduces speed restrictions to safeguard running times.
- Improves track stability and reduces significant creep to limit pull aparts and buckles.
- Reduces the potential for rail defects, traffic delays and broken rail derailments.
- Reduces the maintenance required to replace broken check rail bolts and to realign track moving under down hill breaking coal traffic.

All Traffics / Coal Specific:
The works that comprise this project will benefit all users of the West Moreton Network.

Delivery Provider:
All works undertaken have been delivered by internal Queensland Rail resources.

Contact Officer:
Project Manager

9. Level Crossing Compliance Program

Project Cost ($'000): $370 (excl. Capitalised Interest)

Timelines:

Planning: 20114/15

Project Name	Corridor	2013/14 ($'000)	2014/15 ($'000)	Total ($'000)
Level Crossing Compliance	Rosewood to Jondaryan	[redacted]	[redacted]	[redacted]
	Jondaryan to Columboola	[redacted]	[redacted]	[redacted]

Description of Project and Benefits:

Project Scope:
All public level crossings were reviewed using the Australian Level Crossing Assessment Model (ALCAM) and for compliance with AS 1742 Part 7. There are three crossings that do not comply with both the ALCAM assessment reports and AS 1742 Part 7. These crossings require upgrading from passive protection to flashing lights and boom gates.

Timing	ID & Location	Km	Current Controls	Proposed Controls
2015/16	ID1789 Taylor St Warra Western Line	127.740km	Passive	Flashing Lights & Boom Gates
2016/17	ID2467 Cemetery Rd Chinchilla Western Line	161.61km	Passive	Flashing Lights
2016/17	ID2438 Macalister / Bell Road Macalister Western Line	107.700km	Passive	Flashing Lights
	Total Cost			

The scope of the work delivered is developing Design Input Documentation for tender; Locality Plans for all 3 sites and Equipment type approval documents.

Project Benefits:
- To bring the remaining level crossings into compliance with the ALCAM assessment reports and AS 1742 Part 7.
- Improve the safety and reliability of the rail network with flow on safety benefits for road users.
- Reduced near miss occurrences and accidents and to improve trackside safety.

All Traffics / Coal Specific:
The works that comprise this project will be undertaken to benefit all users of the West Moreton Network.

Delivery Provider:
Work for this project will be undertaken by an external contractor managed by Queensland Rail.

Contact Officer:
Project Manager.

10. Forest Hill Timber Bridge Replacement

Project Cost ($'000): $2,495.7 (excl. Capitalised Interest)

Timelines:

Construction: 2013/14 to 2014/15

Project Name	Corridor	2013/14 ($'000)	2014/15 ($'000)	Total ($'000)
Forest Hill Timber Bridge Replacement	Rosewood to Jondaryan	[redacted]	[redacted]	[redacted]
	Jondaryan to Columboola	[redacted]	[redacted]	[redacted]

Description of Project and Benefits:

Project Scope:
The Forest Hill Timber Bridge Replacement project involves the replacement and extension of the up and down line bridges at the 88.220km on the Main Line. This replacement has been done to aid in flooding effects in and around the Forest Hill community. This work was done in conjunction with proposed works being investigated by the Lockyer Valley Regional Council.

Project Benefits:
- Improves the flooding effects in the Forest Hill area.
- Reduces the risks associated with working on bridges and of damage during major flooding events and bush fires.
- Reduces exposure to defect and work related speed restrictions.

All Traffics / Coal Specific:
The works for this project have been delivered to aid the community and to also improve the reliability of the line by eliminating a timber bridge.

Delivery Provider:
An external contractor under the management of Queensland Rail will be engaged to complete this project except for the track work which will be undertaken by Queensland Rail.

Contact Officer:
Project Manager

11. Isaac Street

Project Cost ($'000): $97.9 (excl. Capitalised Interest)

Timelines:

Planning: 2014/15

Project Name	Corridor	2013/14 ($'000)	2014/15 ($'000)	Total ($'000)
Forest Hill Timber Bridge Replacement	Rosewood to Jondaryan	[redacted]	[redacted]	[redacted]
	Jondaryan to Columboola	[redacted]	[redacted]	[redacted]

Description of Project and Benefits:

Project Scope:
The Isaac Street Bridge is a single span bridge in Toowoomba with a local road traversing under the bridge. The current bridge has life expired bankends and bridge components, which has resulted in the bridge requiring to be removed/replaced. Works to date include: Developed concept designs ranging from new bridge, to pedestrian path to replacement with rail embankment, consultation with the Toowoomba Regional Council.

Project Benefits:
- Reduces the risks associated with working on bridges and of damage from road traffic.
- Reduces costs associated with proposed future maintenance and eliminates labour intensive work practices.
- Reduces exposure to defect and work related speed restrictions.

All Traffics / Coal Specific:
The works for this project have been delivered to improve the reliability of the line by eliminating a timber bridge.

Delivery Provider:
An external contractor under the management of Queensland Rail will be engaged to complete this project except for the track work which will be undertaken by Queensland Rail.

Contact Officer:
Project Manager

12. Siemens Axle Counters

Project Cost ($'000): $1,418 (excl. Capitalised Interest)

Timelines:

Planning: 2013/14
Construction: 2013/14 to 2014/15

Project Name	Corridor	2013/14 ($'000)	2014/15 ($'000)	Total ($'000)
Siemens Axle Counters	Rosewood to Jondaryan	[redacted]	[redacted]	[redacted]
	Jondaryan to Columboola	[redacted]	[redacted]	[redacted]

Description of Project and Benefits:

Project Scope:
The West Moreton Network(Rosewood to Toowoomba) operates under the safeworking system of Remote Controlled Signalling (RCS). The axle counters are part of the RCS and provide the train detection function. The axle counters provide the vital signalling controls and indications between the ends of each section with the interlocking of the next section's starting signal.

The axle counters used are Siemens AZ S 600's which were installed during the late 1980s and early 1990s. These axle counters are no longer manufactured or repaired by Siemens. The scope will include the design, purchase, installation, testing and commissioning of Siemens 350U axle counters to replace Siemens AZ S 600 axle counters and track circuits.

Timing	Location	Road	Cost ($'000)
2014/15	Grantham - Helidon	Up & Down	[redacted]
2014/15	Gatton - Grantham	Up & Down	[redacted]
2014/15	Forest Hill - Gatton	Up & Down	[redacted]
	Total Cost		**1,418**

Project Benefits:
- Improved reliability of the signalling system in the West Moreton Network.

All Traffics / Coal Specific:
The works that comprise this project will be undertaken to benefit all users of the West Moreton Network.

Delivery Provider:
Work for this project will be undertaken by an external contractor managed by Queensland Rail.

Contact Officer:
Project Manager

13. LEDR Radio system Replacement

Project Cost ($'000): $163 (excl. Capitalised Interest)

Timelines:

Planning: 2013/14
Construction: 2014/15 and 2015/16

Project Name	Corridor	2013/14 ($'000)	2014/15 ($'000)	Total ($'000)
LEDR Radio System Replacement	Rosewood to Jondaryan	[redacted]	[redacted]	[redacted]
	Jondaryan to Columboola	[redacted]	[redacted]	[redacted]

Description of Project and Benefits:

Project Scope:
LEDR sub-rate link radios provide linking communications for such services as signalling telemetry and asset monitoring and protection systems.

This project will replace radio links at various locations throughout this rail network to maintain asset availability and improve asset reliability. These radio links provide point to point connectivity to support operational communications to remote sites where a copper or fibre cable connection and carrier derived services are not cost effective or available.

This project includes one major deliverable, the replacement of Toowoomba Range life expired link radios.

Implementation of this strategy will ensure network controllers have continued access to signalling telemetry on the Toowoomba Range, and remote monitoring systems (level crossing, flood height and weather monitoring) to aid efficient and safe rail operations.

These costs will see the planning, procuring of materials and start of replacement work. Works will be completed in the 2015/16 FY.

Project Benefits:
- Maintain availability of existing backhaul links for operational communications.
- Maintain communications for remote monitoring systems.
- Improved reliability of rail operations resulting in improved on time running.

All Traffics / Coal Specific:
The works that comprise this project will be undertaken to benefit all users of the West Moreton Network.

Delivery Provider:
Work for this project will be undertaken by a Queensland Rail resources.

Contact Officer:
Project Manager

14. Train Radio Network Replacement Project

Project Cost ($'000): $295 (excl. Capitalised Interest)

Timelines:

Planning: 2014/15
Construction: 2015/16

Project Name	Corridor	13/14 ($'000)	14/15 ($'000)	Total ($'000)
Train Radio Network Replacement	Rosewood - Jondaryan	[redacted]	[redacted]	[redacted]
	Jondaryan - Columboola	[redacted]	[redacted]	[redacted]

Description of Project and Benefits:

Project Scope:
To develop and implement the upgrade of the existing train radio network infrastructure and assets including:

- Train Control Radio.
- Maintenance Supervisory Radio.
- Yard radio.
- Wayside radio.
- Wayside Detection Systems.
- Zone Release Radio Shunting.
- Station Communications.
- Associated single and dual channel point to point links.
- Change management including training and transfer of information to third party operators.

A contractor will be engaged through a Design and Construct contract to design, procure and install the radios and to manage the transition from analogue to digital.

Works to date include planning and procurement of some materials.

Project Benefits:

- Improved communication.
- Reduction in down time.
- Improved reliability.

All Traffics / Coal Specific:
The works that comprise this project will be undertaken to benefit all users of the West Moreton Network.

Delivery Provider:
Work for this project will be undertaken by Queensland Rail resources.

Contact Officer:
Project Manager

15. Corridor and Asset Protection Strategy

Project Cost ($'000): $588 (excl. Capitalised Interest)

Timelines:

Planning and Procurement: 2014/15
Construction: 2015/16 to 2016/17

Corridor	2013/14 ($'000)	2014/15 ($'000)	Total ($'000)
Rosewood – Jondaryan	[redacted]	[redacted]	[redacted]
Jondaryan – Columboola	[redacted]	[redacted]	[redacted]

Description of Project and Benefits:

Project Scope:
Wayside detection/asset protection systems are employed to identify and manage operational rail traffic issues. They provide timely warnings to Network Control, Asset Managers and above rail operators of issues that have the potential to adversely affect rail and rollingstock infrastructure, operational effectiveness and the safe running of services.

Early detection and intervention of operational issues and mechanical defects will reduce the risk of damage to the rail network and rollingstock. Examples of mechanical defects are dragging equipment, wheel defects, hot axle bearings, and brake failure. Examples of operational issues are overloaded trains, imbalanced wagon loading, and over or under length trains on the network.

The project will install additional Environment Monitoring Stations (EMS), Dragging Equipment Detectors (DED), Hot Bearing Detectors (HBD) and Wheel Impact Load Detectors (WILD) at key locations in the West Moreton Network. Current progress has seen planning and material procurement started including procurement of DED's, cabinets, and power supplies. Further procurement and installation of the devices is due in the 2015/16 FY.

Project Benefits:

- Provides advance warning alerts of mechanical rollingstock defects.
- Reduction in derailments and rollingstock incidents causing damage and delays.
- Improved monitoring capability of excessively loaded wagons causing damage.
- Improved operational effectiveness and safe running of services.
- Improved reliability of rail operations resulting in improved on-time running.
- Minimise risk of track buckles due to hot weather.
- Manage the operation of rail services over flood prone track sections.

All Traffics / Coal Specific:
The works that comprise this project will be undertaken to benefit all users of the West Moreton Network.

Delivery Provider:
Work for this project will be undertaken by internal Queensland Rail resources and supplemented by external contractors as required.

Contact Officer:
Senior Signal Systems Engineer

2015 DAU Proposed Capex (2015/16 to 2019/20)

Outlined below are the project scopes and estimates that make up the capital program for the West Moreton Network for the 5 year period of 1st July 2015 to 30th June 2020. The scope has been developed collaboratively by the Regional West Infrastructure Planning Team and Networks Group Asset Manager's office. This plan is supported by the West Moreton 10 year Asset Management Plan and previous strategic documents.

The vision for the West Moreton Network is to provide a safe and reliable network that is trusted by customers, where performance is competitive with industry and represents sound value for money for Queensland Rail's stakeholders.

Some of the key strategies that are currently being implemented or in the process of being introduced by Queensland Rail are as follows:

- Preventative not reactive maintenance – to be achieved through better collection and analysis of asset condition data so that faults can be prevented instead of repaired;
- Undertake asset renewals that introduce modern, reliable, low maintenance, less disparate and (where possible) future-proof infrastructure assets;
- More effective planning of works delivery with the aim of minimising the impacts of capital works and major maintenance on network availability and delivering improved productivity outcomes from closures;
- Focus on improved cost-effectiveness by reviewing internal works processes and cost contributors and more effective utilisation of industry through appropriate packaging and tendering of works and management of delivery.

The West Moreton Network was initially constructed in the 1870's and with this provides challenges stemming from the historical use of non-engineered formations built on black soil plains, unstable ash deposits from the original steam trains and the Toowoomba range is geotechnically unstable which presents its own challenges. These challenges are required to be managed carefully with a balance of capital investment and operational maintenance.

The following is proposed with respect to track:

- Targeted replacement of failing 41kg rail in the more heavily used sections
- The removal of rail joints which are major points of deterioration
- The removal of timber sleepers with a priority east of Jondaryan in the loaded direction.

To achieve this it is proposed to relay the remaining check rail curves on the Toowoomba and Little Liverpool Ranges; relay portions of track between Oakey and Jondaryan and the Mailine Up Road, Rosewood to Helidon. Worn and defect prone 41kg rail is to be replaced with 50kg rail between Rosewood and Oakey in select priority sites. Mechanical Joints will be eliminated as far as allowable (220m lengths), between Jondaryan and Columboola.

Elimination of the 26 most problematic timber bridges and steel flood openings. An attempt must be made to progressively upgrade the remaining bridges to reduce risk exposure to extensive maintenance interventions, increasing labour cost and loss of timber expertise.

Assumptions used in determining the asset replacement strategy are:

- 6.3 million net tonnes per year;
- 1 x 48hr closure per month; 2 x 12hr closures per month (Sunday & Monday);
- 15.75 tonne axle load;
- Speed of 60km/hr (loaded train) and speed of 80km/hr for empty trains.
- A reference train comprised of 2 x 90 tonne locomotives plus 41 coal wagons

2015 DAU Project List and Estimate Summary (excl. Capitalised Interest)

	Project Name (Expenditure in $Nominal)	15/16 ($'000's)	16/17 ($'000's)	17/18 ($'000's)	18/19 ($'000's)	19/20 ($'000's)	Total ($'000)
1	Slope Stabilisation on Toowoomba Range	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**8,449**
2	Formation Repairs	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**17,047**
3	Timber and Steel Bridge Elimination	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**35,189**
4	Replace Timber and Steel Bridges with Reinforced Concrete Box Culverts	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**2,338**
5	(New) Drain Renewals	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**8,105**
6	Check Rails Curves	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**16,731**
7	Relay/Recondition Program	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**14,816**
8	Rerailing Program Rosewood to Oakey	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**9,417**
9	Steel Bridge Strengthening	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**2,080**
10	Level Crossing Reconditioning	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**1,836**
11	Level Crossing Compliance Program	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**4,243**
12	Pedestrian Crossing Upgrade Program	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**4,395**
13	Siemens AZ S 600 Axle Counter Replacement Rosewood -Toowoomba	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**1,667**
14	ATP Network System Upgrades	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**572**
15	Corridor and Asset Protection	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**2,973**
16	Digital Telemetry Rollout – West Moreton	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**1,142**
17	DTC Automatic Code Exchange	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**486**
18	Remote Monitoring System Upgrades	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**578**
19	Signalling Pole Route Upgrade Grandchester to Laidley	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**903**
20	Upgrade of 4.5V Solar Track Feed to 12V Helidon to Lockyer (3), Forest Hill to Laidley (3), Yarongmalu (1)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**445**
21	Upgrade of Model 10 Boom Mech	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**351**
22	Upgrade Alternators Grandchester, Yarongmalu, Rangeview	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**526**
23	Upgrade Asbestoses Loc Boxes	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**543**
24	Train Radio Network Replacement Project	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**2,210**
25	Backbone Strategy	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**72**
	Total	**26,042**	**29,775**	**30,541**	**26,208**	**24,548**	**137,114**

2015 DAU Civil Projects

1. Slope Stabilisation on Toowoomba Range

Project Cost ($'000): $8,449 (excl. Capitalised Interest)

Timelines:

Planning: 2014/15
Construction: 2015/16 to 2019/20

Project Name	Corridor	15/16 ($'000)	16/17 ($'000)	17/18 ($'000)	18/19 ($'000)	19/20 ($'000)	Total ($'000)
Slope Stabilisation on Toowoomba Range	Rosewood - Jondaryan	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Jondaryan - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	

Description of Project and Benefits:

Project Scope:
This project involves monitoring and repairing locations along the length of the Toowoomba Range particularly locations where access roads are showing signs of movement through longitudal tension cracking. Works will include the stabilisation of high and steep slopes directly adjacent to the access road and rail corridor. Site inspections were conducted with Golders Associates, whose continued advice forms the basis of this project scope. This work program is expected to continue past 2019/20.

Project Benefits:
Reduced risk of major landslips during inclement weather with the benefits of avoiding such landslips including (but not limited to):

- Reduced risk of derailments, and associated injuries.
- Reduced risk of service delays and/or lost revenue.
- Reduced risk of access road failure, and associated potential injuries, vehicle damage, and productivity losses due to lack of site access.
- Implementing slope stabilisation as a preventative measure will result in better long term outcomes for users of the West Moreton Network.

All Traffics / Coal Specific:
The works that comprise this project will be undertaken to benefit all users of the West Moreton Network.

Delivery Provider:
Work for this project will be undertaken by an external contractor managed by Queensland Rail.

Alternative Options Considered:

Queensland Rail is taking advice from Golders Associates as the technical experts with all options to be considered.

Contact Officer:
Project Manager

2. Formation Repairs

Project Cost ($'000): $17,047 (excl. Capitalised Interest)

Timelines:

Planning: 2014/15
Construction: 2015 to 2020

Project Name	Corridor	15/16 ($'000)	16/17 ($'000)	17/18 ($'000)	18/19 ($'000)	19/20 ($'000)	Total ($'000)
Formation Repairs	Rosewood - Jondaryan	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Jondaryan - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	

Description of Project and Benefits:

Project Scope:
Repairing formation failure, mud holes and ballast pockets throughout the West Moreton Network. A provision of (averaged) 5.65km per year has been allowed at an estimated cost of $[redacted]/km ($2014/15). Currently within Queensland Rail's EAMS database there is 20.8km of formation requiring attention with priorities ranging between one month to five years. It is forecasted that 5.65km per year will ensure defect growth is less than repair works. This work program is expected to continue past 2019/20.

Corridor	15/16 Metres	16/17 Metres	17/18 Metres	18/19 Metres	19/20 Metres	Total
Rosewood - Jondaryan	2,100	2,100	2,350	2,350	2,350	11,250
Jondaryan - Miles	3,550	3,750	3,300	3,300	3,300	17,200
Total Metres	**5,650**	**5,850**	**5,650**	**5,650**	**5,650**	**28,450**

Project Benefits:
Reduces ballast contamination as well as top and line deterioration which causes speed restrictions and potentially derailments.

All Traffics / Coal Specific:
The works that comprise this project will be undertaken specifically to benefit coal carrying customers on the West Moreton Network.

Delivery Provider:
Queensland Rail will remove and replace rail assets. Formation rehabilitation will be undertaken by an external contractor.

Alternative Options Considered:

Depending on the soil strengths at each location different options are considered. This includes varying depths of new formation material and the use of geogrids and gextextiles.

Contact Officer:
Infrastructure Planning Manager West.

3. Timber and Steel Bridge Elimination

Project Cost ($'000): $35,189 (excl. Capitalised Interest)

Timelines:

Planning: 2015/16 to 2019/20
Construction: 2015/16 to 2019/20

Project Name	Corridor	15/16 ($'000)	16/17 ($'000)	17/18 ($'000)	18/19 ($'000)	19/20 ($'000)	Total ($'000)
Timber and Steel Bridge Elimination	Rosewood - Jondaryan	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Jondaryan - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	

Description of Project and Benefits:

Project Scope:
Replace timber and steel bridges, between Rosewood and Columboola, with Prestressed Concrete Bridges or reinforced concrete culverts. Reinstatement of associated trackwork is included and to minimize this requirement, bridges are to be designed on current alignment where practicable.

2015/16 FY figures are based on contracted rates. The forecasted figures have been estimated using an average known cost rate of $30,000/meter for a concrete ballast deck structure.

Year	Bridge Location
2015/16	WL U/BRIDGE 30.680 Oakey Creek
	ML U/BRIDGE 84.000 UP AND DOWN
	ML U/BRIDGE 83.930 UP AND DOWN
	ML U/BRIDGE 83.190 UP AND DOWN
2016/17	ML U/BRIDGE 89.570 DN AND UP RD
	WL U/BRIDGE 135.740 JINGI JINGI CRK
	ML U/BRIDGE 159.560
	ML U/BRIDGE 130.130
2017/18	ML U/BRIDGE 66.440 DN AND UP RD
	WL U/BRIDGE 10.640
	ML U/BRIDGE 115.400
	ML U/BRIDGE 110.040 DN AND UP RD
	WL U/BRIDGE 2.040
	ML U/BRIDGE 115.840
	ML U/BRIDGE 130.340
	ML U/BRIDGE 115.230
2018/19	ML U/BRIDGE 67.930 DN AND UP RD WESTERN CK
	WL U/BRIDGE 117.750
	ML U/BRIDGE 83.070 DN AND UP RD

2019/20	ML U/BRIDGE 57.460 DN AND UP RD
	ML U/BRIDGE 69.060 DN AND UP RD
	ML U/BRIDGE 81.770 DN AND UP RD
	ML U/BRIDGE 61.300 DN AND UP RD

Project Benefits:

- Reduces maintenance costs associated with component degradation/replacement and detailed inspections as shown within the Maintenance product B06 Timber Bridge maintenance.
- Reduces exposure to old technology and labour intensive practices.
- Reduces exposure to defect and work related speed restrictions on bridges and their approaches.
- Long term sustainability of maintaining timber bridges is challenged by the scarcity of skilled workers and the supply of timber components.

All Traffics / Coal Specific:

The works that comprise this project will be undertaken specifically to benefit coal carrying customers on the West Moreton Network. The project would otherwise not be required to be delivered within the five year 2015 DAU period.

Delivery Provider:

An external contractor under the management of Queensland Rail will be engaged to complete this project except for the track work which will be undertaken by Queensland Rail.

Alternative Options Considered:

All bridge replacements are put out to market without specifying a replacement structure type. This allows industry to drive reductions in prices through innovation and packaging up multiple sites.

Contact Officer:

Infrastructure Planning Manager West.

4. Replace Timber and Steel Bridges with Reinforced Concrete Box Culverts on the Coal Corridor

Project Cost ($'000): $2,338 (excl. Capitalised Interest)

Timelines:

Planning: 2014/15
Construction: 2015/16 to 2016/17

Project Name	Corridor	15/16 ($'000)	16/17 ($'000)	17/18 ($'000)	18/19 ($'000)	19/20 ($'000)	Total ($'000)
Replace Timber and Steel Bridges with Reinforced Concrete Box Culverts	Rosewood - Jondaryan	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Jondaryan - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	

Description of Project and Benefits:

Project Scope:
This project involves the replacement of seven timber/steel bridges and flood openings with reinforced concrete box culverts between Rosewood and Columboola. Priorities are based on the condition and residual structural capacity of the existing structures. The works include replacement of former bank end material, installation of new cover material with compacted selected geosynthetic reinforced soil and reinstatement of open track work.

Structures to be replaced are as follows:

Year	Location	Km	Existing Structure	Description of Work
2015/16	Oakey to Jondaryan	39.590	Timber Bridge	Replace with RCBC
	Jondaryan to Dalby	46.90	Timber Bridge	Replace with RCBC
	Jondaryan to Dalby	47.410	Timber Bridge	Replace with RCBC
	Jondaryan to Dalby	63.040	Timber Bridge	Replace with RCBC
2016/17	Macalister to Columboola	111.380	Steel - Flood Opening	Replace with RCBC
	Macalister to Columboola	113.190	Steel - Flood Opening	Replace with RCBC

Project Benefits:

- Reduces the risks associated with working on bridges and of damage during major flooding events and bush fires.
- Reduces costs associated with maintenance and eliminates labour intensive workpractices as shown within the Maintenance product B06 Timber Bridge maintenance.
- Reduces exposure to defect and work related speed restrictions.

All Traffics / Coal Specific:

The works that comprise this project will be undertaken specifically to benefit coal carrying customers on the West Moreton Network. The project would otherwise not be required to be delivered within the five year 2015 DAU period.

Delivery Provider:

An external contractor under the management of Queensland Rail will be engaged to complete this project except for the track work which will be undertaken by Queensland Rail.

Alternative Options Considered:

Companywide Queensland Rail has had great success with replacing single span bridges with culverts. Industry pricing has shown that this is the cheapest option.

Contact Officer:

Infrastructure Planning Manager West.

5. Drain Renewals

Project Cost ($'000): $8,104 (excl. Capitalised Interest)

Timelines:

Planning: 2015/16
Construction: 2016/17 to 2019/20

Project Name	Corridor	15/16 ($'000)	16/17 ($'000)	17/18 ($'000)	18/19 ($'000)	19/20 ($'000)	Total ($'000)
Drain Renewals	Rosewood - Jondaryan	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Jondaryan - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	

Description of Project and Benefits:

Project Scope:
This project is for the replacement of life expired drains throughout the system. These drains are currently suffering from issues including collapsing, movement due to traffic and soil expansion, and calcium chloride reaction. Priority drains for the 16/17 FY will be between Toowoomba and Oakey.

This project will be delivered through design and construct packages of work.

Project Benefits:
- Reduced risk of structural failure or scouring.
- Improved performance of the structure under high rail events.

All Traffics / Coal Specific:
The works that comprise this project will be undertaken to benefit all users of the West Moreton Network.

Delivery Provider:
An external contractor under the management of Queensland Rail will be engaged to complete this project except for the track work which will be undertaken by Queensland Rail.

Alternative Options Considered:

Works will be put out to industry as a package, specifying only an outcome, not the structure type. This ensures the lowest cost possible is achieved through innovation.

Contact Officer:
Infrastructure Planning Manager West.

2015DAU Track Improvement Projects

6. Check Rail Curves, Toowoomba and Little Liverpool Ranges

Project Cost ($'000): $16,731 (excl. Capitalised Interest)

Timelines:

Planning: 2015
Construction: 2015/16 to 2018/19

Check Rails Curves*	15/16 ($'000)	16/17 ($'000)	17/18 ($'000)	18/19 ($'000)	19/20 ($'000)	Total ($'000)
Rosewood - Jondaryan	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Jondaryan - Miles	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	

Description of Project and Benefits:

Project Scope:
Remaining timber sleepered check rail curves on the Toowoomba (4.636km Checkrail project) and Little Liverpool (1.414km Checkrail Project) Ranges are planned to be relayed. The relay will provide new 50kg head hardened rail and 33C1 check rail on an inclined boltless check rail baseplate on concrete sleepers and fresh ballast. The track is to be installed on a designed and monumented alignment at a stress free neutral temperature of 38 degrees celcius. The remaining curves will be delivered in the first four years of the 2015 DAU period, by 2018/19.

Formation is to be repaired as a part of the relay where and as required. High cesses are to be graded throughout to ensure formation drainage unless concentration to a single point of protected flow is required.

Curve estimates have been based on actual costs of $[redacted]/meter.

Fin Year	Short Text	Sum of Cost
2015/16	ML CURVE 140.800	$[redacted]
	ML CURVE 142.738	$
	ML CURVE 142.922	$
	ML CURVE 147.630	$
	ML CURVE 147.802	$
	ML CURVE 150.427	$
	ML CURVE 71.785	$
	ML CURVE 154.578	$
2015/16 Total		**$3,788,187.40**
2016/17	ML CURVE 139.695	$
	ML CURVE 139.796	$
	ML CURVE 139.863	$
	ML CURVE 146.020 LOOP	$
	ML CURVE 146.021	$
	ML CURVE 156.910	$

	ML CURVE 156.977	$
	ML CURVE 160.600 FORKLINE CURVE	$
	ML CURVE 139.141	$
	ML CURVE 142.160	$
	ML CURVE 144.105	$
	ML CURVE 144.318	$
	ML CURVE 144.455	$
	ML CURVE 151.007	$
	ML CURVE 151.095	$
2016/17 Total		**$5,197,477.03**
2017/18	ML CURVE 149.367	$
	ML CURVE 149.928	$
	ML CURVE 150.910	$
	ML CURVE 151.792	$
	ML CURVE 155.498	$
	ML CURVE 155.498 LOOP	$
	ML CURVE 72.948	$
	ML CURVE 152.831	$
	ML CURVE 153.615	$
	ML CURVE 153.749	$
	ML CURVE 71.320	$
	ML CURVE 71.672	$
	ML CURVE 71.750	$
2017/18 Total		**$5,524,549.77**
2018/19	ML CURVE 135.935	$
	ML CURVE 74.111	$
2018/19 Total		**$2,222,077.77**

Project Benefits:

- Improves reliability of this heavily used section, hence reducing derailment likelihood
- Improves track geometry and reduces speed restrictions to safeguard running times
- Improves track stability and reduces significant creep to limit pull aparts and buckles.
- Reduces the occurrence of rail defects, and broken rail derailments.
- Significantly reduces the maintenance required to replace broken check rail bolts as shown within the Maintenance product C54 Rail Repair.

All Traffics / Coal Specific:

The works that comprise this project will be undertaken specifically to benefit coal carrying customers on the West Moreton Network.

Delivery Provider:

Queensland Rail will perform the majority of the work associated with this project with some use of external contractors for earthworks and cranage hire.

Alternative Options Considered:

Nil alternatives considered.

Contact Officer:

Infrastructure Planning Manager West

7. Relay Program

Project Cost ($'000): $14,817 (excl. Capitalised Interest)

Timelines:

Planning: 2015
Construction: 2015/16 to 2019/20

Corridor	15/16 ($'000)	16/17 ($'000)	17/18 ($'000)	18/19 ($'000)	19/20 ($'000)	Total ($'000)
Rosewood - Jondaryan	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Jondaryan - Miles	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	

Description of Project and Benefits:

Project Scope:
The remaining interspersed timber and steel track on the Western line between Oakey to the western end Turnout at Jondaryan, and select portion of the track on the Mainline Up Road between Rosewood and Helidon are to be re-laid with 50kg rail on full depth concrete sleepers and 250mm of fresh ballast. It will include track being installed to a designed and monumented alignment at a stress free neutral temperature of 38 degrees celcius. These sites, totalling 11.86km of relay, target areas where high maintenance is being experienced, including multiple resurfacing events, rail defect propagating and high wear. A provision has been made for formation lowering and capping where required, as part of the relay operation. High shoulders and cesses are to be graded throughout to ensure formation drainage. This work program is expected to continue beyond 2019/20. Estimates have put together using $[redacted]/meter which is based on actual costs of $[redacted]/meter plus 10% contingency.

Project Benefits:
- Improves reliability of these heavily used section, hence reducing derailment likelihood.
- Improves track geometry, track stability and reduces significant creep to limit pull aparts and buckles.
- Reduces the occurrence of rail defects and exposure to traffic interruptions and broken rail derailments.
- Reduces future maintenance requirements such as rail repairs and rail joint maintenance, not only saving labour but improving trackside safety.

All Traffics / Coal Specific:
The works that comprise this project will be undertaken specifically to benefit coal carrying customers on the West Moreton Network.

Delivery Provider:
Queensland Rail will perform the majority of the work associated with this project with limited use of external contractors for earthworks and cranage hire.

Alternative Options Considered:

Consideration was given to using steel sleepers, however given that all sleepers, ballast and rail was being removed it was decided to install the most reliable, low cost option of concrete.

Contact Officer:
Infrastructure Planning Manager West.

8. Rerailing Program

Project Cost ($'000): $9,417 (excl. Capitalised Interest)

Timelines:

Planning: 2015
Construction: 2016/17 to 2019/20

Corridor	15/16 ($'000)	16/17 ($'000)	17/18 ($'000)	18/19 ($'000)	19/20 ($'000)	Total ($'000)
Rosewood - Jondaryan	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Jondaryan - Miles	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	

Description of Project and Benefits:

Project Scope:
Replacement in the higher tonnage corridors of 41kg rail which is showing increased susceptibility as rail wears, fatigue cycles accumulate and the defect discovery rate increases. This 41kg/m rail will be replaced with 50kg/m rail. In conjunction with the rerailing operation, track is to be installed on a monumented designed alignment with rail at a stress free neutral temperature of 38 degrees. Estimates are based on a rate of $[redacted]/meter.

Year	Location	Length km
2015/16	Rerailing Program Rosewood to Oakey	150
2016/17	Rosewood - Helidon (on existing low profile concrete sleepers)	2.500
	Toowoomba - Oakey (on existing concrete sleepers)	1.500
2017/18	Rosewood to Oakey , select priorities	4.400
2018/19	Rosewood to Oakey , select priorities	4.400
2019/20	Rosewood to Oakey , select priorities	4.400

Project Benefits
- Reduces the likelihood of broken rail derailments.
- Reduces exposure to service defects which require shutdowns to remove defective rail and expensive welding in and match grinding of the inserted closure rails.
- Improves the safety and reliability of the track.

All Traffics / Coal Specific:
The works that comprise this project will be undertaken specifically to benefit coal carrying customers on the West Moreton Network.

Delivery Provider:
Queensland Rail will perform the majority of the work associated with this project with limited use of external contractors for earthworks and cranage hire.

Alternative Options Considered:

Nil alternatives considered

Contact Officer:
Infrastructure Planning Manager West

9. Steel Bridge Strengthening

Project Cost ($'000): $2,080 (excl. Capitalised Interest)

Timelines:

Planning: 2014/15
Construction: 2015/16

Project Name	Corridor	15/16 ($'000)	16/17 ($'000)	17/18 ($'000)	18/19 ($'000)	19/20 ($'000)	Total ($'000)
Steel Bridge Strengthening	Rosewood - Jondaryan	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Jondaryan - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	

Description of Project and Benefits:

Project Scope:
Steel bridges within the West Moreton Network are currently being reviewed by a consultant to evaluate their suitability and current condition. These bridges have previously been flagged at a high level for having fatigue issues and nearing the end of their fatigue life.

Following this evaluation remediation and upgrade works will be carried out to ensure they are fit for purpose and their life expectancy is increased.

Given that the exact scope of these works is unknown an allowance of $2M has been proposed.

Project Benefits:
- Increase in reliability.
- Reduction in steel bridge maintenance costs.

All Traffics / Coal Specific:
The works that comprise this project will be undertaken to benefit all users of the West Moreton Network.

Delivery Provider:
Work for this project will be undertaken by a contractor to Queensland Rail.

Alternative Options Considered:

The scope of this work will be prepared by an external consultant. Queensland Rail will follow this advice.

Contact Officer:
Infrastructure Planning Manager West.

10. Level Crossing Upgrade Program

Project Cost ($'000): $1,837 (excl. Capitalised Interest)

Timelines:

Planning: 2015
Construction: 2016/17 to 2019/20

Corridor	15/16 ($'000)	16/17 ($'000)	17/18 ($'000)	18/19 ($'000)	19/20 ($'000)	Total ($'000)
Rosewood - Jondaryan	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Jondaryan - Miles	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	

Description of Project and Benefits:

Project Scope:
Reconditioning of level crossings, in the coal corridor, with 50kg/m rail and full depth concrete sleeper.

Project Benefits:
- Improves reliability of these heavily used section, hence reducing derailment likelihood.
- Reduces the occurrence of rail defects and exposure to traffic interruptions and broken rail derailments.
- Extends cycles for reconditioning.

All Traffics / Coal Specific:
The works that comprise this project will be undertaken specifically to benefit coal carrying customers on the West Moreton Network.

Delivery Provider:
Queensland Rail will perform the majority of the work associated with this project with limited use of external contractors for earthworks and cranage hire.

Alternative Options Considered:

Only the lowest cost long term option of minimum maintenance materials was considered.

Contact Officer:
Infrastructure Planning Manager West.

2015 DAU Signalling Projects

11. Level Crossing Compliance Program

Project Cost ($'000): $4,244 (excl. Capitalised Interest)

Timelines:

Planning: 2015
Construction: 2015/16 to 2017/18

Level Crossing Compliance Program	15/16 ($'000)	16/17 ($'000)	17/18 ($'000)	18/19 ($'000)	19/20 ($'000)	Total ($'000)
Jondaryan - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Description of Project and Benefits:

Project Scope:
All public level crossings were reviewed using the Australian Level Crossing Assessment Model (ALCAM) and for compliance with AS 1742 Part 7. There are crossings that do not comply with both the ALCAM assessment reports and AS 1742 Part 7. These crossings require upgrading from passive protection to active protection.

Timing	ID & Location	Km	Current Controls	Proposed Controls	Cost ($'000)
2015/16	ID1789 Taylor St Warra Western Line	127.740km	Passive	Flashing Lights & Boom Gates	[redacted]
2016/17	ID2467 Cemetery Rd Chinchilla Western Line	161.61km	Passive	Flashing Lights	[redacted]
2016/17	ID2438 Macalister / Bell Road Macalister Western Line	107.700km	Passive	Flashing Lights	[redacted]
2017/18	ID2315 Malu Quarry Access Rd Malu Western Line	48.760km	Passive	Flashing Lights & Boom Gates	[redacted]
	Total Cost				**4,288**

Project Benefits:

- Level crossings compliant with the ALCAM assessment reports and AS 1742 Part 7.
- Improve the safety and reliability of the rail network with flow on safety benefits.
- Reduced near miss occurrences and accidents and to improve trackside safety.

All Traffics / Coal Specific:
The works that comprise this project will be undertaken to benefit all users of the West Moreton Network.

Delivery Provider:
Work will be undertaken by an external contractor managed by Queensland Rail.

Alternative Options Considered:

As this is a compliance project no alternatives were considered.

Contact Officer:
Project Manager.

12. Pedestrian Crossing Upgrade Program

Project Cost ($'000): $4,395 (excl. Capitalised Interest)

Timelines:

Planning: 2013
Construction: 2014/15 to 2019/20

Pedestrian Crossing Upgrade Program	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)	Total ($'000)
Rosewood - Jondaryan	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Jondaryan - Miles	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	

Description of Project and Benefits:

Project Scope:
A number of pedestrian crossings were reviewed using the Australian Level Crossing Assessment Model (ALCAM) and for compliance with AS 1742 Part 7. There are eleven crossings noted on the West Moreton Network that do not comply with both the ALCAM assessment reports and AS 1742 Part 7. These crossings require upgrading to either passive protection or active protection.

Timing	ID & Location	Km	Current Controls	Proposed Controls	Cost ($'000)
2015/16	ID4240 Rosewood / Laidley Rd, Grandchester Main Line	69.59km	Nil	Active	[redacted]
2016/17	ID1035 North St, Toowoomba Western Line	2.11km	Nil	Passive	[redacted]
	ID950 Clark St, Oakey Western Line	29.74km	Nil	Passive	[redacted]
	ID2313 Midsection Pedestrian Access, Jondaryan Station Yard Western Line	44.85km	Nil	Passive	[redacted]
2017/18	ID4232 Turner St / Arthur St, Helidon, Main Line	114.25km	Nil	Active	[redacted]

	ID 1034 Jellicoe St Toowoomba Western Line	1.560km	Nil	Active	[redacted]
2018/19	ID 678 Irvingdale St Bowenville Western Line	57.150km	Nil	Active	[redacted]
	ID 738 Condamine St Dalby Western Line	83.690km	Nil	Passive	[redacted]
2019/20	ID 740 Cunningham St Dalby Western Line	83.500km	Nil	Passive	[redacted]
	ID 2330 Nicholson St Dalby Western Line (4 mazes on one side of the roadway and 2 mazes on the other side of the roadway)	84.180km	Nil	Passive	[redacted]
	Total Cost				4,395

Project Benefits:

- To bring the pedestrian crossings into compliance with the ALCAM assessment reports and AS 1742 Part 7.
- Improve the safety and reliability of the rail network with flow on safety benefits for pedestrian users.
- Reduced near miss occurrences and accidents and to improve trackside safety.

All Traffics / Coal Specific:

The works that comprise this project will be undertaken to benefit all users of the West Moreton Network.

Delivery Provider:

Work for this project will be undertaken by an external contractor managed by Queensland Rail.

Alternative Options Considered:

As this is a compliance project no alternatives were considered.

Contact Officer:

Project Manager

.

13. Siemens AZ S 600 Axle Counter Replacement

Project Cost ($'000): $1,667 (excl. Capitalised Interest)

Timelines:

Planning: 2013
Construction: 2013/14 to 2016/17

Axle Counter Replacement	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)	Total ($'000)
Rosewood - Jondaryan	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Description of Project and Benefits:

Project Scope:

The West Moreton Network (Rosewood to Toowoomba) operates under the safeworking system of Remote Controlled Signalling (RCS). The axle counters are part of the RCS and provide the train detection function. The axle counters count the number of axles in and out of a block section to ensure that the train departing the section did not leave any wagons within the section. The axle counters also provide the vital signalling controls and indications between the ends of each section with the interlocking of the next section's starting signal.

The axle counters used are Siemens AZ S 600's which were installed during the late 1980s and early 1990s. These axle counters are no longer manufactured or repaired by Siemens. Queensland Rail has purchased a limited number of spares for the Siemens AZ S 600 but these will run out in the next few years. It is proposed to replace axle counters with the latest Siemens model. The scope will include the design, purchase, installation, testing and commissioning of Siemens 350U axle counters to replace Siemens AZ S 600 axle counters and block solar fed track circuits.

Project Benefits:

- Improved reliability of the signalling system in the West Moreton Network.

All Traffics / Coal Specific:
The works that comprise this project will be undertaken to benefit all users of the West Moreton Network.

Delivery Provider:
Work for this project will be undertaken by an external contractor managed by Queensland Rail.

Alternative Options Considered:

Nil, this is a replacement of a life expired asset which is no longer supported or manufactured by the supplier. System is being replaced with the approved updated version.

Contact Officer:
Senior Signal Systems Engineer.

14. ATP Network System Upgrades

Project Cost ($'000): $572 (excl. Capitalised Interest)

Timelines:

Planning: 2015/16 to 2016/17
Construction: 2017/18 to 2018/19

ATP System Upgrades	15/16 ($'000)	16/17 ($'000)	17/18 ($'000)	18/19 ($'000)	19/20 ($'000)	Total ($'000)
Rosewood - Jondaryan	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Description of Project and Benefits:

Project Scope:
The existing WESTECT ATP (Automatic Train Protection) system is designed to improve train safety by ensuring the trains can only move when they have authority to do so. ATP is quite complex with multiple interfaces with operational and safety systems. This project is concerned with the trackside equipment of ATP. The ATP system interfaces to the trackside interlocking system and gathers information about the authorised direction of travel and route and sends this information to the on-board loco equipment via a radio transmitter.

The existing trackside radios are approaching end of life. This project will replace approximately half of these radios. It is anticipated that the recovered radios will be able to be retained to support the remaining radios that are not replaced.

Notes:
1. The ATP interface to the interlocking system is called a WESTECT encoder. There is one encoder per interlocking and 2 radios per encoder. The WESTECT encoders were installed on the Western system from 1994 onwards. This equipment has a 15 year life and reached the end of its life expectancy in 2009. Additionally the WESTECT VLM encoder is no longer supported by the manufacturer. The VLM cards require computers to be running a DOS operating system to reliably program the data EPROM's. This legacy means that it is increasingly difficult to make updates to the ATP system to support track and speed changes. A project is underway to develop a new WESTECT encoder to ensure the system can be maintained into the future. It is anticipated that these new encoders will be installed in other parts of the Queensland Rail network (e.g. SEQ), which in turn will release spare equipment that can be used to maintain the existing WESTECT encoders in the West Moreton Network, allowing investment in these encoders to be deferred.
2. It is assumed that the existing radio frequencies used by the WESTECT ATP system can continue to be used. There is currently a possibility that the system will need to be modified to support changes to these frequencies. If this eventuates, the overall strategy for this will need to be reconsidered.

Project Benefits:
- Improved reliability of ATP resulting in reduced corrective maintenance costs as shown is product T29.
- Reduced false triggering of ATP.
- Improved on time running and subsequent train safety.

All Traffics / Coal Specific:
The works that comprise this project will be undertaken to benefit all users of the West Moreton Network.

Delivery Provider:
Work for this project will be undertaken by an external contractor managed by Queensland Rail.

Alternative Options Considered:

Full radio replacement was considered however this was an expensive option. Given that there is limited usage of the existing system from the above rail operator the option of a 50% replacement and using these replaced radios as spares was considered more economical.

Contact Officer:
Senior Signal Systems Engineer

15. Corridor and Asset Protection

Project Cost ($'000): $2,973 (excl. Capitalised Interest)

Timelines:

Planning: 2014/15 to 2015/16
Construction: 2015/16 to 2017/18

Project Name	15/16 ($'000)	16/17 ($'000)	17/18 ($'000)	18/19 ($'000)	19/20 ($'000)	Total ($'000)
Rosewood - Jondaryan	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Jondaryan - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	

Description of Project and Benefits:

Project Scope:

Wayside detection/asset protection systems are employed to identify mechanical rail and rollingstock defects and manage operational rail traffic issues. They provide timely warnings to Network Control, Asset Managers and above rail operators of issues that have the potential to adversely affect rail and rollingstock infrastructure, operational effectiveness and the safe running of services.

Early detection and intervention of operational issues and mechanical defects will reduce the risk of damage to the rail network and rollingstock. Examples of mechanical defects are dragging equipment, wheel defects, hot axle bearings, and brake failure. Examples of operational issues are overloaded trains, imbalanced wagon loading, and over or under length trains on the network.

The project will install additional Environment Monitoring Stations (EMS), Dragging Equipment Detectors (DED), Hot Bearing Detectors (HBD) and Wheel Impact Load Detectors (WILD) at key locations in the West Moreton Network, including:

- Rosewood (EMS).
- Grandchester (EMS).
- Gatton (EMS).
- Grantham (EMS).
- Helidon (HBD + WILD).
- Ballard (EMS).
- Harlaxton (DED).
- Gowrie (EMS).
- Oakey (EMS + WILD).
- Jondaryan (EMS).
- Dalby (EMS).
- Baining (DED).
- Chinchilla (EMS).
- Rywung (EMS).

Project Benefits:

- Provides advance warning alerts of mechanical rollingstock defects that can adversely affect rail infrastructure.

- Reduction in derailments and rollingstock incidents causing track damage and operational delays.
- Improved monitoring capability of excessively loaded wagons causing track and infrastructure damage.
- Improved operational effectiveness and safe running of services.
- Improved reliability of rail operations resulting in improved on-time running.
- Minimise risk of track buckles due to hot weather.
- Manage the operation of rail services over flood prone track sections.

All Traffics / Coal Specific:
The works that comprise this project will be undertaken to benefit all users of the West Moreton Network.

Delivery Provider:
Work for this project will be undertaken by internal Queensland Rail resources and supplemented by external contractors as required.

Alternative Options Considered:

A value engineering exercise was undertaken by the Project Manager to determine the best option.

Contact Officer:
Senior Signal Systems Engineer

16. Digital Telemetry Rollout – West Moreton

Project Cost ($'000): $1,142 (excl. Capitalised Interest)

Timelines:

Planning: 2017/18 to 2017/18
Construction: 2018/19 to 2019/20

Digital Telemetry Rollout – West Moreton	15/16	16/17	17/18	18/19	19/20	Total
	($'000)	($'000)	($'000)	($'000)	($'000)	($'000)
Rosewood - Jondaryan	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Description of Project and Benefits:

Project Scope:
The UTC (Universal Traffic Control) system is used to manage train movements within Queensland Rail's remote controlled signalling territory. For the West Moreton Network, UTC is used from Rosewood to Willowburn.

The existing telemetry that is used to provide communications between the UTC system and the signalling system is based on a life-expired analogue based system that requires an upgrade. Queensland Rail is currently progressing with a project to support a migration to a new telemetry system. This will include development of the core UTC system to support the new telemetry system, as well as trials to prove the system. However, rollout of the new system across the network is currently unfunded.

This project is to rollout the new telemetry system to the West Moreton Network, specifically the interlockings between Rosewood and Willowburn:

- Grandchester.
- Yarongmulu.
- Laidley.
- Forest Hill.
- Gatton.
- Gratham.
- Helidon.
- Lockyer.
- Murphy's Creek.
- Holmes.
- Spring Bluff.
- Rangeview.
- Toowoomba.
- Willowburn.

Project Benefits:

- Maintain reliable operations in the remote controlled signalling territory within the West Moreton Network.

All Traffics / Coal Specific:
The works that comprise this project will be undertaken to benefit all users of the West Moreton Network.

Delivery Provider:
Work for this project will be undertaken by internal Queensland Rail resources, supplemented by external contractors if required.

Alternative Options Considered:

Options were considered around moving to DTC for these areas, however staying with RCS is the cheapest and safest option.

Contact Officer:
Senior Signal Systems Engineer

17. DTC Automatic Code Exchange

Project Cost ($'000): $486 (excl. Capitalised Interest)

Timelines:

Planning: 2014/15 to 2015/16
Construction: 2015/16 to 2016/17

DTC Automatic Code Exchange	15/16	16/17	17/18	18/19	19/20	Total
	($'000)	($'000)	($'000)	($'000)	($'000)	($'000)
Rosewood - Jondaryan	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Jondaryan - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	

Description of Project and Benefits:

Project Scope:
The DTC (Direct Traffic Control) system is used to manage train movements within Queensland Rail's dark territory. For the West Moreton Network, DTC is used west of Toowoomba.

This project will modify the DTC software to support authority codes being passed as data instead of having to be read out by the controller and driver, thereby reducing the amount of time to issue and modify authorities.

Project Benefits:

- Reduce workload on the Network Controller by reducing the amount of time the required to communicate with the driver over the radio and verbally exchanging codes the Network Controller is able to allocate time to other tasks.
- Reduce time required to exchange codes. Analysis shows at least 30% reduction in time to issue/modify an authority. This allows the Network Controller to issue/modify more authorities to better manage the movement of vehicles.
- Allow more train paths as authorities can be modified quicker and Network Control is better able to manage movement of vehicles.
- Reduce chatter on the train radio channel, freeing up capacity for original intended purpose.

All Traffics / Coal Specific:
The works that comprise this project will be undertaken to benefit all users of the West Moreton Network.

Delivery Provider:
Work for this project will be undertaken by internal Queensland Rail resources, supplemented by external contractors if required.

Alternative Options Considered:

This was the only option considered for this project as it maximizes the existing capacity within the current system.

Contact Officer:
Senior Signal Systems Engineer

18. Remote Monitoring System Upgrades

Project Cost ($'000): $578 (excl. Capitalised Interest)

Timelines:

Planning: 2015/16 to 2015/16
Construction: 2016/17 to 2017/18

Project Name	15/16 ($'000)	16/17 ($'000)	17/18 ($'000)	18/19 ($'000)	19/20 ($'000)	Total ($'000)
Rosewood - Jondaryan						
Jondaryan - Columboola						

Description of Project and Benefits:

Project Scope:
There are currently 18 level crossings and 6 weather stations within the West Moreton Network that are monitored via the existing Remote Monitoring System (RMS-V1). This current system (RMS-V1) is outdated technology, no longer available and the system is inflexible to improvement or expansion.

Another project is currently underway to type approve a new version of this system (RMS-V2) that can be supported into the future.

This project is to rollout the new Remote Monitoring System (RMS-V2) at sites within the West Moreton Network that are currently monitored by the existing Remote Monitoring System, as follows.

Level crossings:

- Station Rd, Calvert (ML 64.232km).
- Gaul St, Gatton (ML 96.122km).
- Old Toowoomba Rd, Gatton (ML 98.360km).
- Jones St, Toowoomba (ML 159.212km).
- Bacon Factory Entrance, Willowburn (WL 4.293km).
- Junction Rd, Gowrie (WL 11.620km).
- Kingsthorpe (WL 20.051km).
- Clark St, Oakey (WL 29.743km).
- Cooyar Rd, Oakey (WL 30.915km).
- Sabine Rd, Jondaryan (WL 44.570km).
- Irvingdale St, Bowenville (WL 57.150km).
- Cunningham St, Dalby (WL 83.480km).
- Condamine St, Dalby (WL 83.740km).
- Nicholson St, Dalby (WL 84.160km).
- Jandowae Rd, Dalby (WL 85.805km).
- Wambo St, Chinchilla (WL 163.180km).
- Warrego Hwy, Rywung (WL 179.385km).
- Warrego Hwy, Columboola (WL 194.670km).

Weather stations:

- Yarongmalu (ML 76.250km).

- Forest Hill – Laidley (ML 85.050km).
- Holmes (ML 139.420km).
- Murphy's Creek (ML 139.420km).
- Oakey (WL 30.645km).
- Macalister (WL 117.750km).

Project Benefits:

- Maintain train operations safety.
- Early identification and intervention of operational and mechanical errors so that risk of road and rail accidents can be reduced.
- Early warning of track and environment condition.

All Traffics / Coal Specific:

The works that comprise this project will be undertaken to benefit all users of the West Moreton Network.

Delivery Provider:

Work for this project will be undertaken by internal Queensland Rail resources, supplemented by external contractors if required.

Alternative Options Considered:

Off the shelf options were considered however nothing meets Queensland Rail's requirements, hence this is being developed internally. Hardwire systems are off the shelf.

Contact Officer:

Senior Signal Systems Engineer

19. Signalling Pole Route Upgrade Grandchester to Laidley

Project Cost ($'000): $903 (excl. Capitalised Interest)

Timelines:

Planning: 2015/16
Construction: 2015/16 to 2016/17

Signalling Pole Route Upgrade Grandchester to Laidley	15/16 ($'000)	16/17 ($'000)	17/18 ($'000)	18/19 ($'000)	19/20 ($'000)	Total ($'000)
Rosewood - Jondaryan	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Description of Project and Benefits:

Project Scope:
Signalling Pole Route Upgrade Grandchester to Laidley includes the replacement of the existing pole route with new buried cabling. Total length is approximately 8km.

Project Benefits:

- Upgrade to modern equipment.
- Reduce reactive maintenance.
- Gain in reliability.
- Enables maintainability due to lack of spare parts for existing equipment.
- Reduced system down time.

All Traffics / Coal Specific:
The works that comprise this project will be undertaken to benefit all users of the West Moreton Network.

Delivery Provider:
Work for this project will be undertaken by internal Queensland Rail resources, supplemented by external contractors if required.

Alternative Options Considered:

No alternative option was considered.

Contact Officer:
Senior Signal Systems Engineer

20. Upgrade of 4.5V Solar Track Feed to 12V Helidon to Lockyer (3), Forest Hill to Laidley (3), Yarongmalu (1)

Project Cost ($'000): $446 (excl. Capitalised Interest)

Timelines:

Planning: 2017/18

Construction: 2017/18 to 2018/19

Upgrade of 4.5V Solar Track Feed to 12V Helidon to Lockyer (3), Forest Hill to Laidley (3), Yarongmalu (1)	15/16 ($'000)	16/17 ($'000)	17/18 ($'000)	18/19 ($'000)	19/20 ($'000)	Total ($'000)
Rosewood – Jondaryan	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Description of Project and Benefits:

Project Scope:
Upgrade of 4.5V Solar Track Feed to 12V:

Helidon to Lockyer

- Helidon B3/B4T Loc.
- Helidon B4/B5T Loc.
- Helidon B5/B6t Loc.

Forest Hill to Laidley

- Forest Hill 3/4BT Loc.
- Forest Hill DL 2/3 BT Loc.
- Forest Hill UL/2/3 BT Loc.

Laidley to Yarongmulu

- Laidley 2/3 BT Loc.

Project Benefits:

- Upgrade to modern equipment.
- Reduce reactive maintenance.
- Gain in reliability.
- Increase in spares for other districts.
- Reduced system down time.

All Traffics / Coal Specific:
The works that comprise this project will benefit all users of the West Moreton Network.

Delivery Provider:
Work for this project will be undertaken by internal Queensland Rail resources, supplemented by external contractors if required.

Alternative Options Considered:

This is the lowest cost option, hence no others were considered.

Contact Officer:
Senior Signal Systems Engineer

21. Upgrade of Model 10 Boom Mechanisms

Project Cost ($'000): $351 (excl. Capitalised Interest)

Timelines:

Planning: 2017/18

Construction: 2017/18 to 2019/20

Upgrade of Model 10 Boom Mechanisms	15/16 ($'000)	16/17 ($'000)	17/18 ($'000)	18/19 ($'000)	19/20 ($'000)	Total ($'000)
Rosewood – Jondaryan	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Description of Project and Benefits:

Project Scope:
Replace existing boom mech with model 95:

- Laidley, Patrick St.
- Forest Hill, Laidley Rd.
- Gatton, Gaul St.
- Toowoomba, Bridge St, Jellicoe St West and Griffith St Willowburn.

Replace existing boom mechs with US&S model 95 mech without changing power supplies: Some investigation will be required to determine if this is feasible due to the use of 18V supplies on the 12-16V motors.

Assumptions:

- 2 boom mechs per site.
- New boom mechs to be US&S model 95.
- No changes required in the LX hut or loc.
- No upgrades required to power supplies.
- No new cables or trenches.
- All design and construction work to be completed by Queensland Rail.

Project Benefits:

- Upgrade to modern equipment.
- Reduce reactive maintenance.
- Gain in reliability.
- Enables maintainability due to lack of spare parts for existing equipment.
- Reduced system down time.

All Traffics / Coal Specific:
The works that comprise this project will benefit all users of the West Moreton Network.

Delivery Provider:
Work for this project will be undertaken by internal Queensland Rail resources, supplemented by external contractors if required.

Alternative Options Considered:

No alternatives considered.

Contact Officer:
Senior Signal Systems Engineer

22. Upgrade Alternators Grandchester, Yarongmalu, Rangeview

Project Cost ($'000): $527 (excl. Capitalised Interest)

Timelines:

Planning: 2017/18
Construction: 2017/18 to 2019/20

Upgrade Alternators Grandchester, Yarongmalu, Rangeview	15/16 ($'000)	16/17 ($'000)	17/18 ($'000)	18/19 ($'000)	19/20 ($'000)	Total ($'000)
Rosewood – Jondaryan	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Description of Project and Benefits:

Project Scope:

Upgrade Alternators Grandchester, Yarongmaluu, Rangeview.

Project Benefits:

- Upgrade to modern equipment.
- Reduce reactive maintenance.
- Gain in reliability.
- Reduced system down time.

All Traffics / Coal Specific:
The works that comprise this project will be undertaken to benefit all users of the West Moreton Network.

Delivery Provider:
Work for this project will be undertaken by internal Queensland Rail resources, supplemented by external contractors if required.

Alternative Options Considered:

No alternatives considered.

Contact Officer:
Senior Signal Systems Engineer

23. Upgrade Asbestoses Loc Boxes

Project Cost ($'000): $543 (excl. Capitalised Interest)

Timelines:

Planning: 2018/19
Construction: 2018/19 to 2019/20

Upgrade Asbestoses Loc Boxes	15/16	16/17	17/18	18/19	19/20	Total
	($'000)	($'000)	($'000)	($'000)	($'000)	($'000)
Rosewood - Jondaryan						
Jondaryan – Columboola						

Description of Project and Benefits:

Project Scope:

- TA 92 Loc Case B (Brook St Level Crossing) Currently a Single Width Loc.
- TA 52 BA/-/92DBT Loc (Behind old Milk Factory) Currently a Single Width Loc.
- TA 52 BB/-/92 DCT Loc (Behind old Milk Factory) Currently a Single Width Loc.
- TA BJ Loc (Toowoomba Yard) Currently a Single Width Loc. (Maybe renewed anyway if the Toowoomba Railway Precinct Beautification goes ahead).
- Tycanba Jandowae Rd Level Crossing Locs Currently 2 Single Width Locs +1 Half Width. (This Crossing needs a full upgrade to a Hut or DW + LEDS, Amcos etc.)
- TA North St M/L Level Crossing Loc Case A Currently a Single Width Loc.
- TA 56 Loc Case B (North St West Level Crossing Loc) Currently a Single Width Loc.
- GC LX Loc (Grandchester Level Crossing) Currently a Single Width Loc. (Maybe upgraded anyway if they plan to put Ped Gates there).

Project Benefits:

- Removal of asbestos.
- Modern equipment.
- Reduce reactive maintenance.
- Reduced system down time.

All Traffics / Coal Specific:

The works that comprise this project will be undertaken to benefit all users of the West Moreton Network

Delivery Provider:

Work for this project will be undertaken by internal Queensland Rail resources, supplemented by external contractors if required.

Alternative Options Considered:

Current approved option adopted, no alternatives considered.

Contact Officer:

Senior Signal Systems Engineer

2015 DAU Telecommunications Projects

24. Train Radio Network Replacement Project

Project Cost ($'000): $2,210 (excl. Capitalised Interest)

Timelines:

Planning: 2013/14
Construction: 2014/15 to 2015/16

Project Name	Corridor	15/16 ($'000)	16/17 ($'000)	17/18 ($'000)	18/19 ($'000)	19/20 ($'000)	Total ($'000)
Radio Communications Strategy	Rosewood - Jondaryan	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Jondaryan - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	

Description of Project and Benefits:

Project Scope:
The current Train Control Radio (TCR) and Maintenance Supervisory Radio (MSR) systems consist of a network of radio base stations and links throughout the Queensland Rail network. The base station, link and rolling stock equipment operate on 25 kHz wideband channels in the 400 MHz band. The systems are based on analogue technology and are end of life and need replacement. The same systems are installed across all of Queensland Rail's South East Queensland and regional rail networks as well as Aurizon's Central Queensland Coal Network.

Recently the Australian Communications and Media Authority (ACMA) have announced the following changes to the 400 MHz band:

- Mandatory migration to 12.5 kHz narrowband operation by 31 December 2012 in high density areas (high density areas are defined by the ACMA and essentially encompass the South East Queensland region).
- Migration to the nationally harmonised Rail Industry Only (RIO) band by 31 December 2015 in high density areas and adjacent low density areas within 100 kilometres.
- Migration to the nationally harmonised Rail Industry Only (RIO) band by 31 December 2018 in low density areas which encompass all regional areas in Queensland.

There are several concerns around these changes:

- Migration to narrowband requires replacement of all base station and rolling stock radio equipment as the current equipment is not capable of narrowband operation.
- Migration to the RIO band requires staged introduction of the new channel plan and may require parallel operation of base station equipment.
- Replacement of equipment is a significant undertaking and cannot be carried out in this short timeframe. Through the Australasian Rail Association (ARA), Queensland Rail

together with other jurisdictions are in discussions with the ACMA and Queensland Government to seek an extension to this tight deadline.

- The RIO allocation of 32 channels is likely to be insufficient to support all rail industries' (Queensland Rail, Aurizon and Pacific National) current and future needs.

This project will replace end of life and non-compliant safety critical operational rail radio communications infrastructure including base equipment at radio sites and associated UHF links. If existing radio communications systems are not replaced then Queensland Rail is likely to lose functionality and coverage of its existing systems.

Gradual degradation of mobile communications systems are likely to be caused by interference and in the worst of cases licences to operate the radio systems could be withdrawn making continued use illegal under applicable Federal ACTs – the Radiocommunications Act 1992 and the Telecommunications Act 1997.

This project includes three major deliverables:

- Deliverable 1: TCR.
- Deliverable 2 MSR.
- Deliverable 3: Link radio replacement to support TCR and MSR network.
- Deliverable 4: Migrate remote monitoring systems as required.

Project Benefits:

- Maintain availability of existing TCR, MSR and remote monitoring system capability.
- Ensure compliance with ACMA regulations.
- Minimise potential impact on rail network capacity, efficiency and safety.
- Contribute to improved reliability of rail operations resulting in improved on time running.

All Traffics / Coal Specific:

The works that comprise this project will be undertaken to benefit all users of the West. Moreton Network.

Delivery Provider:

Work for this project will be undertaken by an external contractor managed by Queensland Rail.

Alternative Options Considered:

No alternative considered as this is a compliance project.

Contact Officer:

Network Telecommunications Strategy Coordinator

25. Backbone Strategy

Project Cost ($'000): $72 (excl. Capitalised Interest)

Timelines:

Planning: 2013/14
Construction: 2015/16

Project Name	Corridor	15/16 ($'000)	16/17 ($'000)	17/18 ($'000)	18/19 ($'000)	19/20 ($'000)	Total ($'000)
Backbone Strategy	Rosewood - Jondaryan						
	Jondaryan - Columboola						

Description of Project and Benefits:

Project Scope:
LEDR sub-rate link radios provide linking communications for such services as signalling telemetry and asset monitoring and protection systems.

This project will replace radio links at various locations throughout this rail network to maintain asset availability and improve asset reliability. These radio links provide point to point connectivity to support operational communications to remote sites where a copper or fibre cable connection and carrier derived services are not cost effective or available.

This project includes one major deliverable is to replace Toowoomba Range life expired link radios. Toowoomba to Miles life expired link radios will be addressed in the radio communications strategy.

Implementation of this strategy will ensure network controllers have continued access to signalling telemetry on the Toowoomba Range, and remote monitoring systems (level crossing, flood height and weather monitoring) to aid efficient and safe rail operations.

Project Benefits:
- Maintain availability of existing backhaul links for operational communications.
- Maintain communications for remote monitoring systems.
- Improved reliability of rail operations resulting in improved on time running.

All Traffics / Coal Specific:
The works that comprise this project will be undertaken to benefit all users of the West Moreton Network.

Delivery Provider:
Work for this project will be undertaken by Queensland Rail resources.

Alternative Options Considered:

Nil alternatives considered.

Contact Officer:
Network Telecommunications Strategy Coordinator

Appendix 4 – West Moreton Reference Tariff 2015 DAU Maintenance Submission

Appendix 4

West Moreton Reference Tariff
2015 DAU
Maintenance Submission
(May 2015)

Table of Contents

1. Introduction

Total Maintenance Costs – DAU 15 regulatory period (nominal $'000)

West Moreton Coal Maintenance	2015/16	2016/17	2017/18	2018/19	2019/20
Asset Management	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Structures	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Track (excluding Mechanised Resleepering)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Mechanised Resleepering	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Trackside Systems	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
TOTAL	41,102	22,396	29,628	23,111	26,728

The current access undertaking, entitled '*QR Network Access Undertaking (2008) June 2010*' (2008 AU), was assigned to Queensland Rail via a Transfer Notice on 1 July 2010 as part of the separation of QR Limited into Aurizon and Queensland Rail.

The Queensland Competition Authority (QCA) has formally required that Queensland Rail submit a draft access undertaking to the QCA by 5 May 2015 through the issuance of an initial undertaking notice to Queensland Rail under section 133 of the QCA Act. In response to this notice, Queensland Rail has developed its proposed draft access undertaking, referred to as the 2015 DAU.

Queensland Rail has developed a reference tariff for coal carrying services in the West Moreton system (the rail corridor bounded by Rosewood to the east and Miles to the west[1]) as part of the 2015 DAU. Maintenance costs are an input into this reference tariff. The maintenance costs detailed in this '*West Moreton Reference Tariff 2015 DAU Maintenance Submission*' are a vital component to the operation of a safe and reliable railway corridor on the West Moreton Network, and are an important part of the supply chain.

This submission provides detailed reasoning supporting the maintenance program for the West Moreton Network during the 2015 DAU term (FY 2015/16 to 2019/20). In the following sections of this submission Queensland Rail will explain how these maintenance costs are derived and will summarise key aspects of the costs construction such as the:

- scope of the maintenance task; and
- performance of the maintenance task.

This document should be read in conjunction with the current "Asset Management Plan" (AMP) for the West Moreton Network (refer Appendix 6). The AMP outlines the Network's characteristics, traffic types, business environment, key drivers and details the high level asset descriptions and strategies by which the Network is managed. It is from these strategies that the maintenance plans have been developed.

Also of significant note is the link between the AMP and the 2014 implementation of Queensland Rail's first Enterprise Asset Management System. This system enables Queensland Rail to better understand and monitor the actual condition and degradation of its

[1] While the West Moreton system is bounded by Rosewood and Miles the maintenance costs associated with the reference tariff on the West Moreton Network do not extend west of Columboola.

networks. Although still in its infancy, this is a significant step forward which will revolutionise the way Queensland Rail's future plans will be developed.

This West Moreton Reference Tariff 2015 DAU Maintenance Submission is divided into two main parts.

- The first part (**Sections 4 and 5**) summarises Queensland Rail's maintenance philosophy and maintenance regime.
- The second part identifies the asset maintenance products and forecast cost of the maintenance program (**Section 7 and 8**).

2. Background

The West Moreton Network was constructed and opened to traffic in 1865 between Ipswich and Grandchester, with subsequent extensions reaching Toowoomba in 1867. Historically the line catered for passenger, livestock, freight and primary products (e.g. grain and cotton). Coal carrying services commenced in 1982 initially from mines located just west of Ipswich. Rail export commenced via rail from Jondaryan in 1984, from Macalister in 1994 and from Columboola in 2010. In 2014 the Macalister mine closed. Therefore, coal is not currently railed from this mine.

The West Moreton Network was constructed on black soil plains with no engineered formation, which results in formation regularly failing and having to be rebuilt to enable good track geometry to be maintained. In addition, traversing the Toowoomba Range poses its own problems because significant forces are exerted on the track by trains through tight radius curves resulting in more frequent rail stress adjustments.

The track standard and alignment are lower than that which would be constructed for a new stand-alone heavy haul railway built specifically for coal carrying services. As a consequence of the Network age and track standard, the track section between Rosewood and Miles requires a higher cost maintenance program than would be required for a new stand-alone heavy haul railway in order to safely and reliably deliver contracted tonnages.

3. Maintenance Cost Review Process

Queensland Rail has incorporated efficient maintenance costs that are 'fit for purpose' for the West Moreton Network into its maintenance program for the West Moreton reference tariff. The maintenance plan provides specific detail for each maintenance product including:

- an explanation of the activities that will be undertaken to achieve the business outcomes;
- an analysis of why the proposed approach to maintenance activities was chosen; and
- an analysis of the forecasting approach both in terms of the scope of work and the unit rates used to derive the cost estimates.

4. Queensland Rail's Maintenance Philosophy

4.1 Maintenance and Supply Chain Efficiency

One of the primary ways that Queensland Rail can contribute towards the development and ongoing enhancement of an efficient coal supply chain is via its network maintenance strategy. This is by ensuring that the network is maintained to a standard that delivers an appropriate level of service to users.

Maintenance can impact service quality in a number of ways. The fundamental means is by ensuring that the network can be consistently operated at its maximum operational capability (that is, to the maximum speed and axle load that it has been designed to carry), which in turn enables throughput to be maximised. Service quality will be degraded by the introduction of speed restrictions or disruptions to network availability due to incidents such as derailments or unplanned possessions.

The management of possessions can also influence service quality. Track closures are a necessary part of being able to maintain the network. Their timing and duration have an impact on throughput, particularly where there is limited stockpile capacity at the port. The management of possessions is, therefore, an important part of Queensland Rail's maintenance strategy. As part of Queensland Rail's management of possessions, Queensland Rail actively seeks ways to undertake the required maintenance task without increasing possessions.

4.2 Trade-offs in the Maintenance Strategy

The cost of maintenance is driven by the standard required to achieve a given level of service quality. There is clearly a trade-off between these two factors; given there will be a direct relationship between the standard of the network and the cost of maintaining the network to that standard. Queensland Rail's maintenance regime seeks an appropriate balance between service quality and cost.

If the asset is under-maintained, reduced costs and fewer maintenance possessions are experienced in the short term, however in the longer term, network availability could be reduced as speed restrictions are imposed (to ensure that safety is maintained) and the number and duration of unplanned maintenance possessions increases. It can also result in capital expenditure being brought forward where assets must be replaced due to early failure.

If an asset is over-maintained, users may be bearing a higher cost of maintenance than is necessary to maintain the desired level of service quality. It could also mean that network availability is being compromised as planned possessions are likely to be more frequent.

The balance between service quality and cost can change through time. For example, if the network is not capacity constrained, there may be a higher degree of tolerance for track closures and speed restrictions to the extent that this has less of an impact on the ability of users to meet the requirements of their customers. At the same time, Queensland Rail still has to maintain the network to an appropriate standard to preserve the long-term integrity of its assets and ensure safety is not compromised.

Maintenance of the network to a high standard is particularly important given the implications that speed restrictions and unplanned possessions could have on network availability. At the same time, while unplanned maintenance needs to be minimised it cannot be avoided, so Queensland Rail needs to maintain sufficient flexibility to be able to respond quickly and effectively where unforeseen issues arise. In the current environment, the opportunity cost of foregone throughput to the mines will be very high. However, this will still necessitate taking possession of the track for maintenance in a manner that minimises the impact on users.

A focus on achieving contracted tonnage throughput does not mean that cost becomes less important. Queensland Rail is acutely aware that the costs need to be reasonable and efficiencies should still be extracted to the extent possible. The implications of this on the maintenance strategy (and its associated cost) are a key consideration for Queensland Rail.

The appropriate balance between capital expenditure and maintenance requires the application of judgment and will vary depending on:

- the nature of the asset;
- the historical maintenance regime; and
- current market conditions.

Consequently there are no 'hard and fast' rules that are applied by Queensland Rail in evaluating capital expenditure versus maintenance, other than ensuring that this is routinely considered in planning decisions based on a whole-of-life analysis.

4.3 Vision for the Maintenance Program

Queensland Rail's vision for maintenance is to maintain the network to a standard that maximises supply chain efficiency in a manner that is consistent with the level of service quality desired by users. This is done within the context of a maintenance strategy that maintains the long-term integrity and safety of the network.

5. Queensland Rail's Maintenance Regime

5.1 Planning, Implementing and Managing the Program

5.1.1 Maintenance Planning

Queensland Rail as maintenance provider, develops a forecast of the expected works required. This forecast is done on a number of levels. The annual Network Maintenance Plan forecasts work to be undertaken each year, whilst the Asset Management Plan considers a 10 year maintenance horizon.

5.1.2 Asset Monitoring and Analysis

Asset monitoring and analysis is also a very important part of maintenance planning and delivery. Asset monitoring technology and the associated analytical tools are becoming increasingly sophisticated; delivering more accurate and robust data that is then directly fed into the maintenance planning process. More accurate monitoring of potential defects enables a more proactive maintenance program, which should also generate efficiencies over the longer term. In 2014, Queensland Rail implemented an Enterprise Asset Management System which enables Queensland Rail to better understand and monitor the actual condition and degradation of the network.

5.1.3 Preventative versus Reactive Maintenance

One of the key trade-offs in the maintenance regime is preventative versus reactive maintenance. Preventative maintenance is maintenance that is undertaken at regular programmed intervals to maximise availability and reliability. It is a more proactive approach that seeks to anticipate the likely maintenance effort required based on an understanding of the asset's characteristics and the impact of throughput on its performance. Further, as mentioned, this assessment is improved by regular asset monitoring and analysis.

Reactive maintenance is performed in response to a failure, noting that assets can fail for a number of reasons (including incidents on the network). This will generally need to be

prioritised depending on the risks arising from the failure. Immediate corrective maintenance will be undertaken where the failure has a potentially significant safety, environmental or operational risk. Deferred corrective maintenance, which may be identified during the course of preventative maintenance, is performed where the potential risk is not significant. The maintenance may be deferred because of the scale and scope of work required.

It could be argued that the more preventative maintenance is carried out, the less corrective maintenance is required; however, this does not mean preventative maintenance should not be efficient and targeted. There are levels of preventative maintenance beyond which additional maintenance is not efficient (that is, it is effectively 'over maintaining' the asset). In addition to this there are circumstances that could lead to asset failure, which are independent of the level of preventative maintenance that has been undertaken, such as extreme weather events or derailments that are not caused by track defects. Maintenance planning therefore needs to achieve an appropriate balance between preventative and reactive maintenance, taking into consideration constraints imposed by possessions.

5.2 Driving Efficiency and Innovation in Maintenance

Driving continuous improvement needs to be an integral part of the maintenance regime irrespective of the current demand environment. However, the constraints imposed by demand pressures may determine what is regarded as 'efficient'. For example, efficiency is not necessarily limited to doing more with less, or finding ways to reduce costs.

Where the number and duration of maintenance windows are limited, the challenge is to be able to take maximum advantage of these windows, which could actually lead to increased costs associated with the mobilisation of equipment and resources in a single location (including the costs associated with doing multiple shifts). Queensland Rail has implemented a closure program for the West Moreton Network which is coordinated with the Metropolitan Network to maximise the intensity of the maintenance effort while minimising the impact on throughput.

6. Key Drivers of the 2015 DAU Forecasts

6.1 Service Delivery

Typically Queensland Rail undertakes all planning of work and inspections relating to the existing assets. The following table sets out who undertakes the delivery of these activities when not undertaken by Queensland Rail Network Regional (Network Regional) resources:

Track Management	
Activity Name	**Service Delivery**
1. Maintenance Ballast	The sourcing of ballast is achieved through competitive tendering with transport also being an external supplier
2. Formation Repairs	While the removal and reinstatement of track is undertaken by Network Regional staff, earthworks and supply of ballast are generally sourced through contractors
3. Sleeper Management	This activity is achieved by utilising Queensland Rail Network (Network) resources
4. Track Recording Inspections	This activity is achieved by utilising Network resources
5. Track Reconditioning & Removal	Materials are sourced externally with the activity being carried out by Network Regional resources and earthworks contractors
Rail Management	
Activity Name	**Service Delivery**
1. Rail Grinding Main Line	This activity is delivered by an external contractor
2. Rail Grinding Turnouts	This activity is delivered by an external contractor
3. Rail Joint Management	This activity is achieved by utilising Network Regional resources and specialised contractors
4. Rail Repair	This activity is achieved by utilising Network Regional resources and specialised contractors
5. Ultrasonic Testing – On track machine	This activity is delivered by an external contractor
6. Ultrasonic Testing – Manual	This activity is achieved by utilising Network resources
Off Track Management	
Activity Name	**Service Delivery**
1. Level Crossing Construction/ Maintenance	Track work is undertaken by Network Regional with the remainder of this activity being outsourced
2. Earthworks – Non Formation	This activity is delivered by an external contractor
3. Fencing	Major fencing is outsourced with any minor repairs being undertaken by Network Regional staff
4. Fire and Vegetation Control	Network Regional staff undertake burning off and the application of on track weedicide with the majority of other activities being carried out by contractors
5. Monument/Signage Erection	This activity is typically outsourced
6. Track Clean Up	Depending on the size of the activity, large work will be outsourced
Structures Management	
Activity Name	**Service Delivery**
2. Drainage Construction/Repairs/Mtce	Minor work is achieved by utilising internal resources with larger work typically being outsourced
3. Repairs Concrete Bridges	Minor work is achieved by utilising internal resources with larger repair work typically being outsourced
6. Retaining Wall Construction/Repairs	Minor work is carried out in house with larger repair work typically being outsourced
7. Structures Pest Control	Typically work is carried out by Network Regional staff with the supply of product being outsourced
8. Ancillary Structure Construction/Repairs	Minor work is carried out in house with larger repair work typically being outsourced

6.2 Tonnage Forecast Impacts

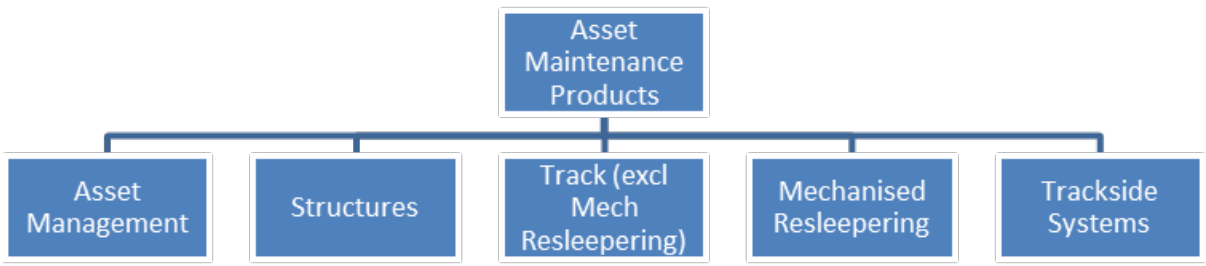
Tonnage forecasts for the 2015 DAU regulatory period have reduced from the previous submission. This rate has reduced from 7.545 Mnt to 6.3 Mnt. The following table highlights product by product the implication tonnage changes (reductions) have on the Network when the Network is in a mature state. It is also worth noting that the split on a dollar per dollar basis for products which are affected by tonnages to those which are not is approximately 50%.

Code	Description	Volume related	Comments
A07	Inventory Mgt & Fixed Asset Stocktakes	N	
A09	Consulting/Technical Advice	N	
A15	Asset Management	N	
A18	Project Mgmt & Services	N	
B04	Repairs Concrete Bridges	N	
B05	Repairs Steel Bridges	N	
B06	Repairs Timber Bridges	Y	With the exception of the increased pile replacements in 2015/16 and 2019/20 there is a year on year reduction in timber bridge maintenance linked to the capital bridge replacements and decreased tonnages.
B10	Steel Bridge Paint (Contract)	N	
B50	Structures Inspections	N	
B51	Structures Pest Control	N	
B52	Drainage construction	N	
B53	Drainage maintenance	N	
B55	Retaining wall maintenance	N	
C02	Ballast Undercutting (Other)	Y	This product does relate to tonnages, however once high ballast is in place (as it currently is) a reduction in tonnage doesn't reduce the scope, hence doesn't relate to tonnage in this scenario
C06	Earthworks - Non Formation	N	
C07	Fencing	N	
C08	Rail Joint Management	Y	This product does relate to tonnage, however given the strategy to weld out rails to 220m lengths over the coming years and requirements for lifting and packing dipped joints (which have rail memory) costs have not reduced because of tonnage. However we are seeing a significant reduction to costs year on year in this product as a result of the welding out to longer rails, the capital relay's Oakey to Jondaryan and rerailing activities in the capital program.
C09	Rail Renewal	Y	This product does relate to tonnages, Measured wear rates from miniprof data shows a replacement frequency of approximately 15 to 18 years out of a population of 36km for tight radius. The proposed replacement of 2km per year is in line with the proposed tonnage profile.
C10	Turnout Maintenance	Y	This product does relate to tonnage, costs have reduced in the plan due to reduced tonnages.
C18	Mechanised Resleepering	N	As the data for this product is based on actual known defective sleepers in track and that the replacement is occurring in 15/16 FY there is no tonnage impact to this product.
C19	Mechanised Resurfacing	Y	Resurfacing levels are significantly lower in this term, which is a function of reduced tonnages and capital upgrades.
C23	Mech Resurfacing - Turnouts	Y	While this work is partly driven by volume, the scope of work over the period remains very small.
C25	Rail Grinding - Mainline	Y	Grinding spend has been reduced in relation to reduced tonnages.
C26	Rail Grinding - Turnouts	Y	Grinding spend has been reduced in relation to reduced tonnages.
C28	Minor Yard Maintenance	N	
C29	Track Geometry Recording	N	
C30	Ultrasonic Test Ontrack Machine	N	

Code	Description	Volume related	Comments
Code	Description	Volume related	Comments
C37	Monument /Signage Maintenance	N	
C42	Maintenance Ballast	Y	Outside of year one (elevated due to resleepering program), maintenance ballast spend has been reduced in relation to reduced tonnages.
C43	Sleeper Management	Y	Although this product is related to tonnages, a significant portion of the failure mechanism for timber sleepers is independent to tonnages (e.g. weather, sleeper quality, wear and tear, re-railing, resurfacing), hence this product has not been reduced for reduced tonnages.
C44	Fire & Vegetation Management	N	
C47	Rail Stress Adjustment	N	
C48	Ultra Sonic Testing (Manual)	N	
C50	Track Inspections	N	
C52	Rail Lubrication	Y	This product is directly related to the number of axles passing over the blade. This product has been reduced due to the reduced tonnage.
C53	Top & Line Spot Resurfacing	Y	Although this product is related to tonnages, a portion of these increasing costs in this product are related to the reduction in mechanised resurfacing. More work is now undertaken via this process where it is inefficient to use the larger machines. In addition to this poor formation material itself is causing holes to appear which require spot repairs.
C54	Rail Repair	Y	The product is related to tonnage, however significant numbers of closure rails require welding due to internal defects found through ultrasonic inspections in the 41kg. We are seeing a significant reduction to costs year on year in this product as a result of the replacement of check rail curves eliminating check rail bolt failures on the Toowoomba Range. The majority of the cost reduction in this product is due to the capital replacement of check rail curves.
C57	Level crossing maintenance	N	
C58	Level crossing constr/recond.	N	
T10	Prevent Tele Bkbone Ntwrk Mtce	N	
T13	Phone/Data Maintenance	N	
T28	Prevent Signalling Field Mtce	N	
T29	Correct Signalling Field Mtce	N	
T53	Signalling Level Xing Protect	N	
T58	Cable Route Maintenance	N	
T62	Signalling Train Protect System	N	
T63	Wayside Monitoring System Mtce	N	

7. Asset Maintenance Products

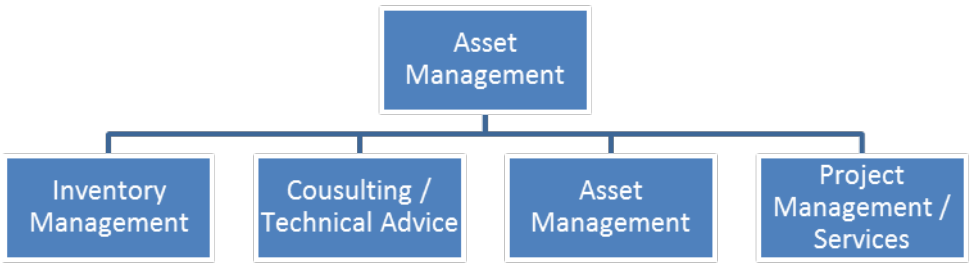
The maintenance products that are undertaken to maintain the West Moreton Network can be described using the five categories as shown below



Each of these five categories has a hierarchy of maintenance product codes that describe the maintenance tasks and are used for capturing the costs of these products. The budget for each of these products (represented by separate product codes) is shown individually in the Network Maintenance Plan. Work undertaken in these product codes is then recorded and monitored.

The following sections provide descriptions of each of the maintenance products in each of the categories shown above, including a summary of the scope and delivery of work. The assumed unit rates are set out in the detailed maintenance plan.

7.1 Asset Management



Product A07: Inventory Management

Inventory asset management involves the management of all inventory, stocktake and clean up, retrieval of material, audits and administration.

Costs associated with this activity are one inventory control officer with an allowance for accommodation. Table A07-1 below shows the breakdown of these costs for the 15/16 FY and table A07-2 shows the forecast cost summary for the five year period based on historical expenditure.

Table A07-1 – Inventory Management (2015/16)

A07	Total Internal Labour	Total Internal Plant	Total External Costs	Total Consumable Component	Total
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	**$120,844**

Table A07-2 - Inventory Management (nominal $)

A07	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Product A09: Consulting / Technical Advice

Consulting and Technical Advice includes costs associated with advice received from Queensland Rail's internal engineers and external engineering companies for technical advice. Table A09-1 below outlines estimated costs for consulting and technical advice for the 15/16 FY. Table A09-2 shows the forecast for the five year period. These costs are an allowance, based on historical expenditure.

Table A09-1 - Consulting / Technical Advice (2015/16)

A09	Total Internal Labour	Total Internal Plant	Total External Costs	Total Consumable Component	Total
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	$395,056.48

Table A09-2 - Consulting / Technical Advice (nominal $)

A09	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Product A15: Asset Management

An overall product code has been developed to capture asset management costs. The asset management costs are those associated with the management of speed restrictions, administration and execution of strategic planning, the organisation of management and data input and analysis.

This product includes internal resources and an allowance for travel and accommodation. Table A15-1 below shows the breakdown of these costs for the 15/16 FY and table A15-2 shows the five year forecast based on an allocation process.

Table A15-1 - Asset Management (2015/16)

A15	Total Internal Labour	Total Internal Plant	Total External Costs	Total Consumable Component	Total
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	$649,783.68

Table A15-2 - Asset Management (nominal $)

A15	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Product A18: Project Management / Services

The project management and project services product includes all cost associated with project management of operational projects. These costs include projects such as asset review and renewal type projects. Table A18-1 shows a breakdown of these costs for the 15/16 FY and table A18-2 shows the forecast for five years. These costs are an allowance, based on historical expenditure.

Table A18-1 - Project Management / Services (2015/16)

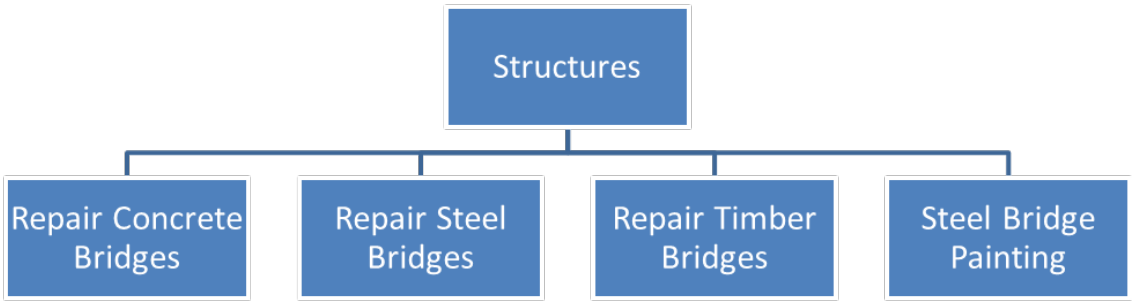
A18	Total Internal Labour	Total Internal Plant	Total External Costs	Total Consumable Component	Total
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	$61,421.36

Table A18-2 - Project Management / Services (nominal $)

A18	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

7.2 Structures

7.2.1 Structures (Bridges)



Activities included under structures management are those that relate to maintenance that effect structures that support rail over road crossings, road over rail crossings and those structures that provide drainage under the track

Product B04: Concrete Bridge Repairs

The activity covered under this product includes repairs to concrete bridges that involve the replacement/renewal of any components. This includes kerb raising, walkway repairs, pier/abutment renewals, and top and lining. The below costs are for the remediation of an abutment on a concrete bridge over North Street in Toowoomba.

Table B04-1 shows a breakdown of these costs for the 15/16 FY and table B04-2 shows the forecast for five years.

Table B04-1 - Concrete Bridge Repairs (2015/16)

B04	Total Internal Labour	Total Internal Plant	Total External Costs	Total Consumable Component	Total
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	$156,000.00

Table B04-2 - Concrete Bridge Repairs (nominal $)

B04	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Product B05: Steel Bridge Repairs

This product covers all repairs to steel and steel and concrete composite bridges that involve the replacement/renewal of any components. This includes walkway repairs, pier/abutment renewals, top and lining, transoms renewal, girder repairs and tightening fastenings.

Table B05-1 shows a breakdown of these costs for the 15/16 FY and table B05-2 shows the forecast for five years. These are typical annual maintenance costs.

Table B05-1 - Steel Bridge Repairs (2015/16)

B05	Total Internal Labour	Total Internal Plant	Total External Costs	Total Consumable Component	Total
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	$246,729.01

Table B05-2 - Steel Bridge Repairs (nominal $)

B05	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Product B06: Timber Bridge Repairs

This product covers all maintenance and repairs to timber bridges that involve the replacement/renewal of any components. This includes walkway/escape repairs, pier/abutment renewals, top and lining, tightening fastenings, component renewal/repairs (e.g. corbels, headstocks, girders, transoms, and piles).

The majority of existing bridges in the West Moreton Network are rated to 15.75 tonne axle load (TAL). These bridges were originally designed for 12 TAL (Imperial) or B16 steam locomotives. The bridges from Rosewood to Miles have been assessed with respect to their suitability to the axle configuration of existing traffic and loading of consists. The desktop assessment has shown that, under the existing loadings, these bridges are operating at the limit of their capability.

Owing to the existing gross tonnages on the West Moreton Network, timber bridges are incurring high maintenance costs, increased closure requirements and carry an elevated risk of derailment compared to concrete and steel alternatives.

Maintenance of timber bridges is necessary due to the biodegradation of timber, mechanical wear and damage, corrosion of fasteners, erosion of wood at joints and insect attack. All of these factors, cause a timber bridge to deteriorate and become less serviceable until maintenance is undertaken.

Timber bridges require a substantial quantity of timber for their maintenance. With the supply of timber decreasing and the demand for products made from wood increasing, these trends indicate that wood production is unlikely to meet forecast demand in the near future increasing the price of raw materials.

While the rate of hardwood plantation establishment has increased in recent years this timber is not suitable for most timber bridge components until it is of the order of 40 to 50 years old. In addition, hardwood saw millers have started to rationalise and amalgamate their operations reducing the supply of such construction material.

Timber bridge general maintenance involves checking of alignment and tightening of bolts to the correct geometry. A typical six metre timber span has six piles, two headstocks, six corbels, three girders and 12 transoms which as well as the need for general maintenance, requires care for, and replacement of components. Wood is a biological material, and is therefore subject to various types of degradation, fungal decay, wood destroying insects, weathering and fire, all of which can lead to hazardous situations, and to which concrete and steel are largely immune.

Concrete and steel bridges do not require regular component replacement. Concrete and steel structures general maintenance involves inspections and monitoring of cracks of all components and bearings. Steel structures require regular cyclic maintenance involving painting and transom replacement. As illustrated above, timber bridge maintenance is

resource intensive compared to the maintenance regime required for concrete or steel structures.

It is becoming very difficult to recruit and retain skilled people in the regional areas of Queensland. Timber bridge carpentry is a specialised skill and one that very few other industries require. Maintenance of steel and concrete structures, as well as not being as labour intensive as that for timber structures, is adequately serviced by skills that are readily available in the labour market place.

Timber bridges on the low tonnage freight lines can sustain timber bridging for many more years. However, timber bridges on the West Moreton Network are subject to large annual tonnages with most axles being loaded to the bridges' maximum capabilities making maintenance of these old structures a continuing task.

At present there is approximately 3,900 metres of timber bridges (109 bridges) still remaining in the West Moreton Network. Queensland Rail is of the view that a strategy to continue the reduction in the amount of timber bridging is essential to manage the reduced supply of timber, accommodate skilled labour shortages, and provide structures that meet contemporary performance standards. Achieving this goal will take decades and therefore the continued maintenance of these assets will be necessary.

Table B06-1 shows a breakdown of these costs for the 15/16 FY and table B06-2 shows the forecast for five years.

15/16 FY and 19/20 FY show an elevated spend based on the fact that in these two financial years the underground pile inspections are to be completed. Because of this, a significantly higher number of piles are typically replaced in these financial years. Outside of this anomaly the trend of spending in each financial year is reducing, which is aligned with the reduction in timber bridge numbers through the capital replacement program.

Table B06-1 - Timber Bridge Repairs (2015/16)

B06	Total Internal Labour	Total Internal Plant	Total External Costs	Total Consumable Component	Total
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	$1,643,719.99

Table B06-2 Timber Bridge Repairs (nominal $)

B05	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Product B10: Steel Bridge Painting

The steel bridge painting product includes all work involved in painting of steel bridge structures. This painting includes spot clean and painting and full repaint of steel structures. Steel bridge painting is required to maintain steel structures in good condition and to extend the serviceable life.

Current strategies have spot clean and painting works to be done on 15 structures during the 19/20 FY and a full repaint of the structures over Lockyer Creek in Gatton and over Rocky Creek in Chinchilla in 17/18 FY. These works will be undertaken by external contract.

There are no costs predicted in this product for the 15/16 FY. Table B10-1 below shows the cost forecast for the next five years.

Table B10-1 - Steel Bridge Painting (nominal $)

B05	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

7.2.2 Structures (Other)

Product B50: Structures Inspections

All inspections of structures including Civil Engineering Structures Standard (CESS) inspections, pile exams, stage exams, underwater inspections, maintenance team inspections, termite inspections, structures master audits and construction audits are included in this product.

As discussed previously 15/16 FY and 19/20 FY show an elevated spend based on the fact that in these two financial years the labour intensive underground pile inspections are going to be completed.

Table B50-1 shows a breakdown of these costs for the 15/16 FY and table B50-2 shows the forecast for five years.

Table B50-1- Structures Inspections (2015/16)

B50	Total Internal Labour	Total Internal Plant	Total External Costs	Total Consumable Component	Total
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	$644,741.58

Table B50-2 - Structures Inspections (nominal $)

B50	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood – Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Product B51: Structures Pest Control

This product includes pest control on all structures and termite control and other pest management activities. Table B51-1 below shows the forecast costs for the next five years.

Table B51-1 Structures Pest Control (nominal $)

B51	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Product B52: Drainage Construction

This product involves the repair and construction of drainage utilising concrete and or steel components (e.g. culverts, helicore pipes). This product generally includes works such as drain extensions and maintenance activities such as grouting repairs. Due to the nature of the task, a track closure is necessary to carry out the works. Full drainage construction is generally capitalised hence is not contained in this product.

The works forecast for this product include the extension of a drain on the Toowoomba Range, as it is causing embankment issues, and the remediation of some drainage issues at the Wambo Street Level crossing in Chinchilla.

Table B52-1 below shows forecast costs for the next five years.

Table B52-1 - Drainage Construction (nominal $)

B52	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Product B53: Drainage Maintenance

This product includes the general maintenance activities in maintaining drainage structures. The Toowoomba Range is a critical link that relies on the adequate operation of drainage structures. Annually all cross drains on the range are cleaned with up slope v drains being cleaned bi-annually.

Cleaning is usually done using excavators and vacuum excavators.

Table B53-1 shows a breakdown of these costs for the 15/16 FY and table B53-2 shows the forecast for five years.

Table B53-1 - Drainage Maintenance (2015/16)

B53	Total Internal Labour	Total Internal Plant	Total External Costs	Total Consumable Component	Total
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	$378,525.68

Table B53-2 - Drainage Maintenance (nominal $)

B53	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Product B55: Retaining Wall Construction/Repairs

This product includes the construction and repair of retaining walls. There are a number of retaining walls in the Network ranging in types from crib walls to sleeper and rail retaining walls to heritage listed stone pitched walls.

Only minor maintenance is predicted for the coming five years including maintaining of heritage walls and spot replacement of sleeper and rail type retaining walls. There has been considerable expenditure on the sleeper retaining wall in Laidley during the 14/15 FY hence no works are planned for the 15/16 FY.

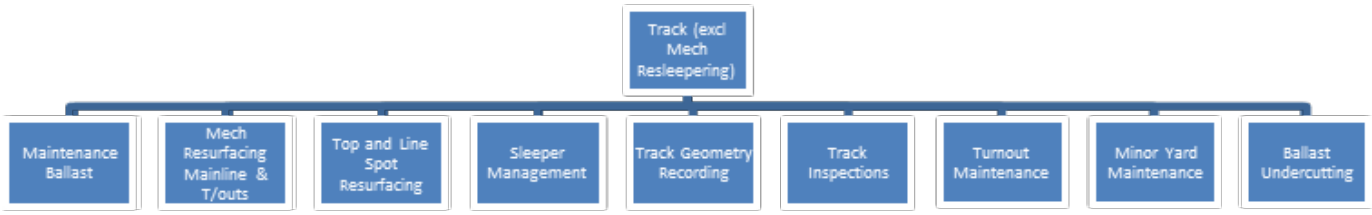
Table B55-1 below shows the forecast spend.

Table B55-1 - Retaining Wall Construction/Repairs (nominal $)

B55	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

7.3 Track (excl Mech Resleepering)

7.3.1 Track Structure



Products included under track structure are those that relate to the overall performance of the track structure. These products ensure that the geometry and stability of the track is maintained to a safe and appropriate operating level

Product C42: Maintenance Ballast

This product involves the purchase, freight and running out of ballast for restoration of ballast profile only. The majority of these costs are associated with the deploying of ballast trains.

Table C42-1 shows a breakdown of these costs for the 15/16 FY and table C42-2 shows the forecast for five years.

The 15/16 FY has an elevated spend for this maintenance product, this additional spend is linked to the significant mechanised resleepering activity being undertaken in this year. The general reduction in costs reflects the capital program improving the track structure.

Table C42-1 - Maintenance Ballast (2015/16)

C42	Total Internal Labour	Total Internal Plant	Total External Costs	Total Consumable Component	Total
Rosewood – Columboola	[redacted]	[redacted]	[redacted]	[redacted]	$1,076,297.04

Table C42-2 - Maintenance Ballast (nominal $)

C42	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood – Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Product C19 and C23: Mechanised Resurfacing – Mainline and Turnouts

Mechanised resurfacing is a standard railway maintenance function applied to keep track within design geometry parameters. It assures correct levelling and lining, which keeps vertical and lateral forces and accelerations within acceptable limits by shifting the track into the correct position.

Mechanised resurfacing is performed at intervals depending on numerous conditions, including speed, tonnage and deterioration rate of the track to name a few. The task is completed using self-propelled on-track machines that are able to lift and line the track to a pre-determined level, and compact the ballast under the rail seat to support the new track position.

Scope of the resurfacing products has been forecast based on the historical performance of the asset whilst taking into account new capital investments that will reduce the maintenance demand over the duration of the undertaking. The scope for mechanised resurfacing is generally driven by:

- gross tonnes across the track;
- the standard of track construction (e.g. rail size, sleeper type, etc.);
- the current condition of the track and formation components;
- the historical performance of the infrastructure in service; and
- weather events (i.e. high rail fall).

The planning of track maintenance works, particularly to maintain track geometry, requires considerable skill and experience to achieve cost-effective outcomes. Considerable effort has been placed in the last six months to develop long term resurfacing programs and create fixed protocols to minimise changes to this plan. This plan has allocated "shifts" where resurfacing machines will be available to work within the West Moreton coal Network. Work has been done working with the train operations planning team to plan for opportunities to maximise possession windows within each shift.

There is a total of 255 production shifts planned in the West Moreton Network to ensure the districts overall track condition is maintained to appropriate levels. This will ensure the Network has minimal speed restrictions and operates in a reliable safe manner. These shifts include the resurfacing work required for mainline and turnouts.

The mechanised resurfacing costs have been based on number of shifts required to maintain the West Moreton Network. Each shift costs approximately $11,750 which includes labour, machines and consumables. Table C19-1 shows a breakdown of the costs planned for the 15/16 FY. Table C19-2 shows the planned forecast for the next five years for mainline resurfacing. This planned forecast takes into account a reduction in maintenance costs due to capital upgrades and welding of 220m track sections. Table C23-1 shows the forecast for turnout resurfacing.

Table C19-1- Mechanised Resurfacing – Mainline and Turnouts (2015/16)

C19	Total Internal Labour	Total Consumables and Machines	Total
Rosewood - Columboola	[redacted]	[redacted]	$3,120,000.00

Table C19-2 - Mechanised Resurfacing – Mainline (nominal $)

C19	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Table C23-1 - Mechanised Resurfacing – Turnouts (nominal $)

C19	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Product C53: Top and Line Spot Resurfacing

Top and line spot resurfacing encompasses all activities associated with restoring top and line to track using manual or mechanically assisted processes. It involves restoring top and line on bridge ends, open track, using manual processes or small spot tampering machinery (e.g. modified bobcat, portable tamper, mini excavator etc). However, it excludes activities undertaken by major production resurfacing machines.

Table C53-1 below shows the breakdown of costs planned for the 15/16 FY. Table C53-2 shows the forecast for five years.

Table C53-1 - Top and Line Spot Resurfacing (2015/16)

C53	Total Internal Labour	Total Internal Plant	Total External Costs	Total Consumable Component	Total
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	$1,426,599.20

Table C53-2 - Top and Line Spot Resurfacing (nominal $)

C53	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Product C43: Sleeper Management

The sleeper management task encompasses activities such as spot insertion of sleepers, reboring, regauging, plating, respacing and fastener installation by local track teams. Typically the most significant task in sleeper cluster management. Due to the nature of the task, track closures are necessary to carry out the works.

Table C43-1 below shows the breakdown of costs planned for the 15/16 FY. Table C43-2 shows the forecast for five years. Given that the mechanised resleepering activity will be undertaken in the 15/16 FY it is expected that costs for the C43 product will reduce to minimum levels in 16/17 FY and increase year on year until the next major resleepering activity takes place (expected 20/21 FY).

Table C43-1 (2015/16) - Sleeper Management

C43	Total Internal Labour and Plant	Total Consumable Component	Total
Rosewood - Columboola	[redacted]	[redacted]	$390,000.00

Table C43-2 - Sleeper Management (nominal $)

C43	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Product C29: Track Geometry Recording

Track Recording (TR) is a general term used to define the use of mobile measuring vehicles used to obtain an overall condition of the track when considering measured track geometry and trends across the rail network. The output of the measured run includes notification of abnormal variations in track geometry to infrastructure maintainers, trending data over time of track geometry improvements and deterioration rates.

This data is used to monitor the asset condition (it is a key input into the OTCI measure of rail condition) and identify major issues that require attention. It also has a limited role in the long term planning of the programmed maintenance activities, however due to the relatively long periods between inspections (four months) it is not currently the major driver of the timing of key interventions such as resurfacing.

Track recording is currently undertaken by Queensland Rail owned machines. Table C29-1 shows the forecast for five years.

Table C29-1 - Track Geometry Recording (nominal $)

C29	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Product C50: Track Inspection

Inspections are undertaken to maintain the civil infrastructure. These inspections ensure that the infrastructure operates safely and effectively. These inspections are carried out in accordance with Queensland Rail's Civil Engineering Track Standards Module CETS 1 – Track Monitoring.

Defects found during these inspections are entered into the Enterprise Asset Management System (EAMS) for actioning and repairing. From EAMS, work programs are developed to remove/repair the defects within the timeframes that are specified. Queensland Rail Network target zero overdue repairs in line with their business principles.

The following inspections are undertaken to maintain civil infrastructure:

- Scheduled Hi-rail Patrol Inspection every 96 hours (twice a week).
- Front of Train General Inspection every four months.
- Planner Hi-rail Patrols at six week intervals.
- Track Recording Car inspections every four months.
- Asset Manager Hi-rail Inspection every six months.
- Engineering Hi-rail Inspection yearly.
- Hot Weather/Flood Hi-rail Inspection when the ambient temperature exceeds 38 degrees Celsius or when local flooding is evident.
- Sleeper Inspections, every timber sleeper is inspected every five years.
- Periodic Walking Inspection by the Planner.
- Points and Crossings Inspection by the Planner.
- Other Inspections/Events that Generate Defect Identification:
    - Driver reports;
    - Noise complaints;
    - Public complaints;
    - Letters to the Minister;
    - Station staff complaints;
    - Derailments;
    - Level crossing collisions; and
    - Vandalism.

Table C50-1 below shows the breakdown of costs planned for the 15/16 FY. Table C50-2 shows the forecast for five years. Inspections are expected to be the same year on year.

Table C50-1 - Track Inspection (2015/16)

C50	Total Internal Labour	Total Internal Plant	Total External Costs	Total Consumable Component	Total
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	$812,476.81

Table C50-2 - Track Inspection (nominal $)

C50	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood – Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Product C10: Turnout Maintenance

This activity encompasses all maintenance associated with turnouts with the exclusion of mechanised resurfacing and turnout tie replacement. Activities include the repair or replacement of components such as switches, vees, guard rails, associated jewellery including bolts, chair lubrication, maintenance welding, top and line (manual).

Table C10-1 below shows the breakdown of costs for turnout maintenance. Table C10-2 shows the forecast costs for turnout maintenance.

Table C10-1 - Turnout Maintenance (2015/16)

C10	Total Internal Labour	Total Internal Plant	Total External Costs	Total Consumable Component	Total
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	$156,000.00

Table C10-2 - Turnout Maintenance (nominal $)

C10	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood – Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Product C28: Minor Yard Maintenance

Yard maintenance entails the day-to-day maintenance performed within rail yards that do not have a corridor code. Any maintenance performed by local or mechanised work groups regardless of the product being undertaken also covers this activity. This activity does not usually require track closures.

Table C28-1 below shows the breakdown of costs planned for the 15/16 FY. Table C28-2 shows the forecast for five years.

Table C28-1 - Minor Yard Maintenance (2015/16)

C28	Total Internal Labour	Total Internal Plant	Total External Costs	Total Consumable Component	Total
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	$239,345.60

Table C28-2 - Minor Yard Maintenance (nominal $)

C28	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood – Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Product C02: Ballast Undercutting

The ballast undercutting product includes all works involved in either undercutting of track sections and lowering of excessively ballasted sections of track. Undercutting works are performed in the district by the use of an excavator mounted under cutter bar. Track lowering is generally carried out in large sections and is done by removing the track and grading ballast away and then replacing the track. Ballast during track lowering exercises is generally reused however new ballast is required for undercutting works.

Table C02-1 below shows the breakdown of costs planned for the 15/16 FY. Table C02-2 shows the forecast for five years.

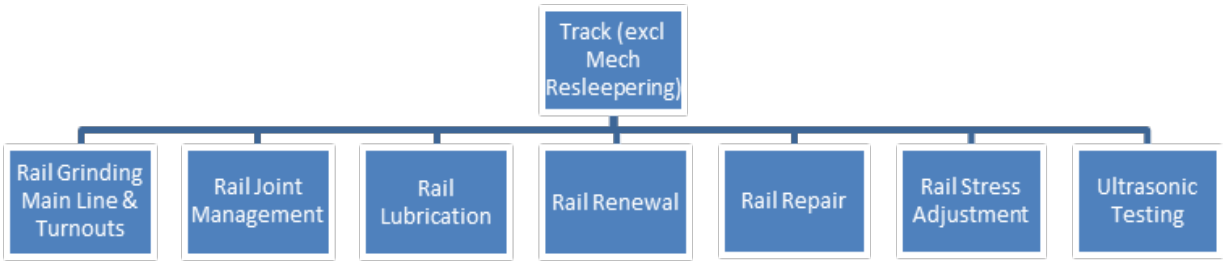
Table C02-1 - Ballast Undercutting (2015/16)

C02	Total Internal Labour	Total Internal Plant	Total External Costs	Total Consumable Component	Total
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	$1,216,371.92

Table C02-2 - Ballast Undercutting (nominal $)

C02	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood – Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

7.3.2 Rail Management



Products included under rail management are those that relate to the overall performance of the rail. These products ensure that the rail is maintained to a safe and appropriate operating standard.

Queensland Rail Network programs replacement of rail so that the limits of wear specified in Queensland Rail's Safety Management Standard are not exceeded.

Product C25 and C26: Rail Grinding – Mainline and Turnouts

Rail grinding is an essential maintenance function that Queensland Rail performs on its coal system. Wear and surface defects are the dominant factors in determining the life of rails and wheels. Rail and wheel profiles are designed to maintain a controlled average 'contact band', with sufficient contact radii to cater for a range of wear conditions.

It is, therefore, imperative that wheel/rail contact be accurately maintained and conditions not allowed to depart too far from the average. The objectives are to efficiently introduce, and thereafter maintain appropriate rail profiles, and to remove small surface fatigue cracks. Benefits include:

- extending rail life;
- reducing resurfacing cycles (predominately for turnouts);

- extending track component life;
- reducing wear rates on rolling stock wheels; and
- reducing wheel squeal and flange noise.

The different types of rail grinding work carried out are as follows:

- profile establishment (i.e. modification of rail head shape to establish a new shape);
- profile maintenance (i.e. grinding of rail to maintain rail profile shape);
- corrective profiling (i.e. rails with surface defects);
- profile modification (i.e. stress reduction to allow increased axle loads); and
- removal of rail corrugations.

Mainline Rail Grinding Cycles

The maintenance grinding frequency is determined by the combined effects of gross tonnages, axle loads, train speeds, alignment curvature and traffic loads. These are the dominant factors in deciding return frequencies.

Rail grinding is currently outlined in the Civil Engineering Track Standards (CETS) as to be performed every:

- 10 million gross tonnes (MGT) on curves less than 1,000 m radius;
- 20 MGT on curves between 1,001 m and 2,500 m radius; and
- every 40 MGT on other track.

Through implementing a grinding regime, rail life is significantly increased. Without rail grinding the life of the rail is drastically reduced for curves less than 1000 m radius. From a risk perspective, once the 40 MGT threshold is reached without a grinding cycle, the risk of the rail breaking due to the propagation of a surface initiated cracking defects increases dramatically.

Current grinding plans for the 2015/16 FY are to grind all curves less than 1000m radius and selected straights where there is defects such as corrugations or where new rail has been installed. The grinding of new rail is done to ensure the wheel-rail interface is optimal and reduces rail and wheel wear.

This grinding program consists of 107.25km of grinding between Rosewood and Jondaryan and 2.08km between Jondaryan and Miles.

The Civil Engineering Track Standards are based around grinding for 20TAL lines and hence consideration needs to be given to the grinding on the 15.75TAL West Moreton Network. The 2015/16 FY grinding is based on the grinding of tight radius curves, straights with defects forming, and where new rail has been installed.

Grinding in the future financial years is to be refined 6-12 months prior to grinding occurring through inspections and rail wear measurements. These measurements are taken using specialised rail wear equipment and monitoring the change in rail profile. The costs for grinding in the 16/17 FY and onwards are predictions as to the wear and tonnage passage through the network.

All major rail grinding in the West Moreton Network is done by contract with Aurizon. Current costs for mainline grinding are $[redacted]/km. As all costs are external costs a breakdown has not been outlined.

Table C25-1 - Mainline Rail Grinding Cycles (nominal $)

C25	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood – Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Turnout Grinding Cycles

As with mainline track, turnouts are ground on a gross tonnage basis. Due to their position in track (located close to signals/yards) they generally experience higher traction forces than open track. This can cause a higher number of defects to form on the turnout. With the cost of a turnout being approximately 20 times greater than open track the operation has become a very important preventative maintenance practice for Queensland Rail.

Currently all works are being done through a contract with Aurizon with each turnout costing $7008.

Table C26-1summarises the planned number of turnouts to be ground for the reference tariff period and total cost is shown in table C26-2.

Table C26-1 - Turnout Grinding Cycles – Planned No of Turnouts

C26	2015/16	2016/17	2017/18	2018/19	2019/20
Rosewood - Columboola	14	13	25	15	12

Table C26-2 - Turnout Grinding Cycles (nominal $)

C26	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Product C08: Rail Joint Management

Rail joint management includes all activities associated with the maintenance of a rail joint. This encompasses flashbutt welding, thermite welding of joints, bolt and fish plate maintenance, glue joint maintenance, joint lifting, top and lining joints.

This product takes into account the cost associated with the works currently being done and planned for welding of 220m lengths through the timber and steel sleepered sections.

Table C08-1 below shows the breakdown of costs planned for the 15/16 FY. Table C08-2 shows the forecast for five years.

Table C08-1 - Rail Joint Management (2015/16)

C08	Total Internal Labour	Total Internal Plant	Total External Costs	Total Consumable Component	Total
Rosewood – Columboola	[redacted]	[redacted]	[redacted]	[redacted]	$1,706,972.87

Table C08-2 - Rail Joint Management (nominal $)

C08	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood – Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Product C52: Rail Lubrication

This product includes all activities associated with rail lubrication which involves the lubrication of track on curves, including maintenance and filling of the lubricators. The majority of lubricators in the district are a Portec mechanical type lubricator.

Table C52-1 below shows the breakdown of costs planned for the 15/16 FY. Table C52-2 shows the forecast for five years.

Table C52-1 - Rail Lubrication (2015/16)

C52	Total Internal Labour	Total Internal Plant	Total External Costs	Total Consumable Component	Total
Rosewood – Columboola	[redacted]	[redacted]	[redacted]	[redacted]	$266,127.68

Table C52-2 - Rail Lubrication (nominal $)

C52	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Product C09: Rail Renewal

Controlling the rate of rail wear is a critical aspect of optimising rail life. Managing rail wear rates through rail husbandry and monitoring ensures safety and commercial objectives are met.

Rail wear occurs as table wear, side wear or as a combination of both. The manner in which rail wears will depend upon a number of factors including; wheel and rail profiles, rail size, rail metallurgy, track structure, track geometry, traffic type, traffic loading, and traffic mix.

Queensland Rail Network civil maintenance staff examine the rail head profile for excessive wear on a regular basis. The side and table wear of the head of the rail is measured and the percentage head wear loss is determined. Queensland Rail Network programs replacement of rail so that the limits of wear specified in Civil Engineering Track Standard are not exceeded.

All curves are measured a minimum of once a year with tangent track measured when deemed necessary based on rail age, tonnage, ultrasonic testing results and walking inspections. Queensland Rail Network has established a rail wear database to keep accurate records that enable rail life predications to be made and have systems in place to ensure that worn rail is replaced in a timely manner.

In general, all new rail that is installed on tight radius curves is now 50 kg/m head-hardened rail which will give an extended rail life and longer intervals between remedial grinding. Head hardened rail does not give the same benefits in tangent and larger radius curves as there have been examples where defects propagate quicker in these applications.

Scope

The district currently has 36.4km of curves less than 300m radius between Rosewood and Jondaryan. Using current wear rates the rail in these curves are remaining within the Civil Engineering Track Standard limits for on average between 15 and 18 years. Hence a program of rail replacement is needed to ensure these curves remain in a safe and reliable condition.

The district already currently has a number of tight radius curves where the rail is nearing the end of its useable life. These curves are on the Toowoomba Range. It is planned to rerail 2km of these curves during the 15/16 FY and continue this 2km of rerailing each financial year through the 2015 DAU period.

The following table shows the breakdown of costs for the 15/16 FY and table C09-2 shows the five year forecast.

Table C09-1 - Rail Renewal (2015/16)

C09	Total Internal Labour	Total Internal Plant	Total External Costs	Total Consumable Component	Total
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	$967,824.00

Table C09-2 - Rail Renewal (nominal $)

C09	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood – Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Product C54: Rail Repair

Rail repair includes all activities associated with spot renewal or repair of rail due to identified defects. Failures or defects in rail such as wheel burns, defective welds, internal rail defects, defect glued joints, broken bolts and other associated activities such as distribution, unloading rail, and flagging are all concerned with this activity. This product also includes the repair of running rail by maintenance or arc welding.

Table C54-1 below shows the breakdown of costs planned for the 15/16 FY. Table C54-2 shows the forecast for five years. The reduction is product year on year is due to the capital program to replace all the timber sleeper check railed curves.

Table C54-1 - Rail Repair (2015/16)

C54	Total Internal Labour	Total Internal Plant	Total External Costs	Total Consumable Component	Total
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	$1,610,103.63

Table C54-2 - Rail Repair (nominal $)

C54	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Product C47: Rail Stress Management

This activity includes tasks such as rail stress testing, creep marker monitoring, and the complete process of rail stress adjustment, for example additional rail and anchors. Due to the nature of the task, track closure is necessary to carry out the works. The costs included in this product include restressing of sections where track works and modifications have occurred.

Table C47-1 below shows the breakdown of costs planned for the 15/16 FY. Table C47-2 shows the forecast for five years. The initial years show a reasonably high cost due to the amount of works planned such as track lowering, welding of rails to 220m lengths through timber and steel sleepers sections and generally restressing works required. Once these works are complete and along with the planned capital upgrades to concrete and continuously welded rail, the re-stressing costs will decline as shown below.

Table C47-1 - Rail Stress Management (2015/16)

C47	Total Internal Labour	Total Internal Plant	Total External Costs	Total Consumable Component	Total
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	$825,801.89

Table C47-2 - Rail Stress Management (nominal $)

C47	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Product C30: Ultrasonic Inspection – On Track Machine

Mobile ultrasonic testing is part of Queensland Rail's risk management process that monitors rail condition and reports variations from defined civil standards. The inspections are undertaken approximately four times a year across the West Moreton Network to reduce the risks associated with inclusions inherent with rail manufacture, weld inclusions and defects.

At the conclusion of each data collection run the information is analysed and a report is prepared which highlights any structural defects which require immediate action and longer term trends in rail wear. This information is an important tool in determining the rail renewal strategy across the network.

All works are delivered using contract machines. Table C30-1 below shows the forecast for the next five years.

Table C30-1 - Ultrasonic Inspection – On Track Machine (nominal $)

C30	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Product C48: Ultrasonic Testing – Manual

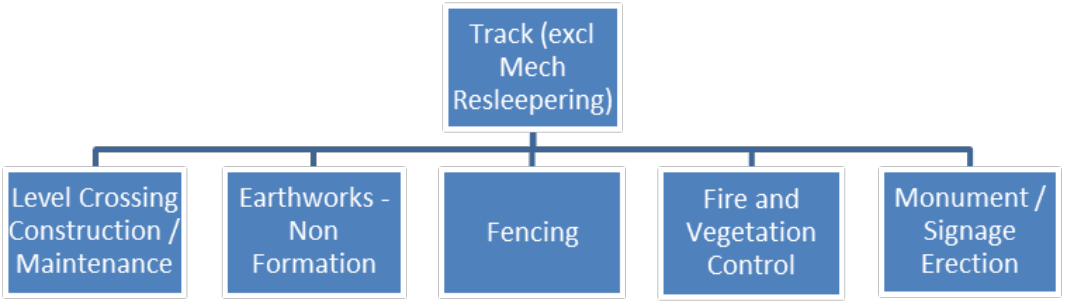
This task involves all the activities associated with the manual ultrasonic testing of rail. Tasks include rail tester's ultrasonic testing of rail, turnout components, tools and welds. This excludes the support of the ultrasonic testing car.

Table C48-1 below shows the forecast for the next five years.

Table C48-1 - Ultrasonic Testing – Manual (nominal $)

C30	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

7.3.3 Off Track Maintenance Management



Products included under off track maintenance management are those that relate to maintenance activities that do not relate directly to the track structure.

Product C57: Level Crossing Maintenance

This product involves all costs associated with the maintenance of level crossings including bitumen pothole repairs, signage repairs, traffic control required for the works, any temporary works such as traffic deviations.

There are no costs predicted in the 15/16 FY due to the amount of major works done to the level crossings during the 14/15 FY.

The below table shows the forecast for the next five years. The number of crossings vary depending on works required. For example, where resurfacing of crossings or pot hole repair is required then traffic control or road closures may be required. However if there are only minor works required such as signage replacements then a higher number of crossings will be worked on.

Table C57-1 - Level Crossing Maintenance (nominal $)

C57	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Product C58: Level Crossing Construction

This product includes all costs associated with the renewal of all level crossings. Involves the renewal of any track components such as rail, sleepers, plates, track resurfacing, signage, ballast & the renewal/repair of the road surface.

The below table shows the forecast for the next financial year. A change in accounting principles has resulted in the remaining 4 financial years renewals being capitalised and captured in the capital document.

Table C58-1 - Level Crossing Construction (nominal $)

C58	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Product C06: Earthworks – Non-Formation

This activity comprises of all non-formation related earthworks and drainage construction and maintenance. Other tasks include the maintenance of access roads, walkways, disposal of surplus material, the reshaping and cleaning of surface drains, reshaping cess drains, widening cuttings, building up embankments, widening cesses, and maintaining cuttings and embankments by the removal of rocks and loose materials. In recent years there have been significant experiences relating to:

- land slips/slides;
- rock falls;
- embankment failures; and
- washouts.

The majority of the challenges relating to non-formation earthworks are on the Toowoomba and Little Liverpool Ranges where there is need for a continual program of drainage and access road maintenance.

The close proximity (typically 1.5 - 2m) between the railway and the cut slopes, and the tight radius curves required to manage the steep topography limits the opportunity to re-align the track further away from the toe of the cut slope to create a buffer to geotechnical hazards.

Vegetation and surface water drainage have a significant influence on contributing to small scale slope instability and rock fall. If not diverted into adjacent gullies, water run-off shedding down the spurs and ridges above the railway will wash over the cutting face and recharge these slopes, increasing the potential of circular-type slumping failure in weathered rock.

The railway is designed to manage surface and groundwater flows through the use of drains along the side of the railway (known as cess drains) and across ridges and spurs on slopes above the railway (known as diversion drains), and culverts diverting water flow below the railway.

The West Moreton Network requires regular re-establishment of the original diversion drains across the topography upslope of railway cuttings to effectively minimise the flow of surface water run-off away from the cuttings. This reduces the risks associated with elevated pore water pressures causing slumps, and scouring of surface water aggravating dislodgement of rocks. This work involves accessing the slopes to clear the diversion drains of re-growth vegetation, and re-establishing the flow of water along the drains by removing silt and rock build-up.

These actions assist in reducing water flow over the face of cuttings and significantly reduce the risk of rock fall or larger geotechnical slope failure. The cess drains along the edge of the railway on the ranges' areas' are generally adequate to manage normal rain fall events (e.g. rain fall <25 mm per day), but in many areas are filled with fine material washed from the slope, or rock fall debris. This reduces their ability to adequately manage water flow from high rain fall events resulting in potential track washout issues.

The cess drains require routine clearing of fine material and rock debris to promote water flow towards the established culverts. In many areas, the cess drain is very close to the railway, and will present access issues for earthmoving equipment.

Table C06-1 below shows the breakdown of costs planned for the 15/16 FY. Table C06-2 shows the forecast for five years.

Table C06-1 - Earthworks – Non-Formation (2015/16)

C06	Total Internal Labour	Total Internal Plant	Total External Costs	Total Consumable Component	Total
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	$15,235.74

Table C06-2 - Earthworks – Non-Formation (nominal $)

C06	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Product C07: Fencing

Fencing activities encompass any construction, reinstatement or maintenance of fencing. Activities include installation of new fencing, complete replacement, repairs, installation of gates, warning signs, removal of fencing, and any earthworks or flagging associated with fencing. This is to ensure safety of the rail corridor for Queensland Rail customers.

Fencing is typically done by external contractors at a current rate of $[redacted]/meter.

The table below outline the forecast for the next five years.

Table C07-1 – Fencing (nominal $)

C07	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Product C44: Fire and Vegetation Control

Fire and vegetation management activities involve the control of vegetation by chemical and mechanical means; burn offs to eliminate vegetation interference with train running and track maintenance. This includes the following processes: vegetation control around bridges, slashing, brush cutting, hi rail and manual herbicide treatment, tree surgery, fire and vegetation management, fire breaks, burning off, tree planting, fire fighting and pest management plans. This activity does not usually require track closures.

Table C44-1 below shows the breakdown of costs planned for the 15/16 FY. Table C44-2 shows the forecast for five years.

Table C44-1 - Fire and Vegetation Control (2015/16)

C44	Total Internal Labour	Total Internal Plant	Total External Costs	Total Consumable Component	Total
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	$1,446,559.52

Table C44-2 - Fire and Vegetation Control (nominal $)

C44	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Product C37: Monument/Signage Erection

Monument maintenance encompasses all activities associated with the survey and erection of track monuments, mast information plaques, creep markers and general signage (e.g. speed boards, etc). This activity does not require track closures.

Due to recent flooding event of the Toowoomba Range a large number of the monuments have been disturbed or knocked out completely. Estimates from survey consultants for the resurvey and placement of new monument markers have come to $[redacted]. This cost is planned to be spread across the 15/16 and 16/17 financial years.

Table C37-1 below shows the breakdown of costs for the next five years.

Table C37-1 - Monument/Signage Erection (nominal $)

C37	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

7.4 Mechanised Resleepering

Product C18: Mechanised Resleepering

This activity comprises the replacement of defective timber sleepers in a pattern or at random using specialised resleepering teams and machines to achieve high production.

Queensland Rail has generally maintained the timber sleepered track in the regional freight network through a robust “one pass maintenance” cyclic sleeper renewal program delivered by an internally resourced production gang. The one pass maintenance approach predominantly includes renewal of defective timber sleepers and resurfacing support for the inserted sleeper to ensure they are bearing weight and maintain the integrate on the track structure.

Queensland Rail has a cyclic sleeper renewal program, which is 10 year plan for Mechanised Resleepering by corridor. In planning forward years the required quantity of sleepers for renewal are forecast initially based on the percentage residual ineffective sleepers at the time of the last sleeper renewal cycle, or previous sleeper testing, which occurs every five years.

A degradation rate of 5% of the total timber sleeper population is applied per year to forecast the demand for budgeting and timber supply purposes. The sleeper renewal cycle for respective corridors is planned as the forecast percentage of ineffective sleepers approach intervention limits as outlined in the Civil Engineering Track Standards.

Sleeper testing using the proprietary ZetaTech sleeper testing system occurs every five years and this is generally phased to occur one year prior to the sleeper renewal cycle. This ZetaTech testing during the planning for delivery phase of the cyclic sleeper renewal program is used to confirm the required scope of sleeper renewal. Some variation from the forecast figures to actuals sleepers requiring renewal will be identified at this time.

The sleeper renewal program in the West Moreton Network for the reference tariff period is below given in terms of sleeper quantities and cost:

Table C18-1 West Moreton Sleeper Renewal Quantities

C18	2015/16	2016/17	2017/18	2018/19	2019/20
	Renewal Quantity	Renewal Quantity	Renewal Quantity	Renewal Quantity	Renewal Quantity
Rosewood - Columboola	56,848	0	0	0	0

Table C18-2 West Moreton Sleeper Renewal Costs (nominal $)

C18	2015/16	2016/17	2017/18	2018/19	2019/20
	($'000)	($'000)	($'000)	($'000)	($'000)
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

The averaged sleeper insertion rate in the West Moreton Network for 2015/16 is $[redacted]/sleeper (1 July 2014 $) and this rate includes:

- purchase and freight delivery/distribution of materials;
- project management (i.e. Program, track possession planning, work quality documentation, etc);
- purchase & installation of DSS plates for 80% of sleepers ($[redacted]/sleeper contribution to unit cost);
- full Resurfacing;
- Track Protection Officers are provided by the internal delivery team & is included in the resleepering labour unit price ($[redacted]/sleeper); and
- includes 5% risk.

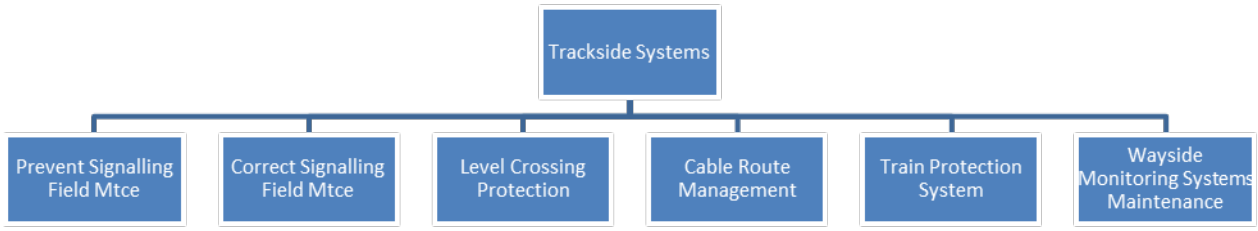
Escalating this rate to 1 July 2015 gives a unit rate/sleeper of $[redacted], broken into components as follows:

Table C18-2 West Moreton Sleeper Renewal Breakdown of Rate 2015/16

Resleeper Labour	Resurface Labour	Distribution & Clean-up	Materials	Resleeper Plant	Resurface Plant	Travel. Establishment & Accomm	5% Risk	Unit Rate $/Sleeper
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

The actual rate will vary by location as a function of track possession and access. Note that the average sleeper insertion rate is based on a delivery method which integrates the delivery of resleepering in the West Moreton Network with geographically similar corridors (e.g West of Miles, Glenmorgan Branch, Toowoomba & Willowburn yards, etc.), where work can continue on the less heavily trafficked, geographically similar corridors when track possession is not available on the West Moreton Network. This creates efficiencies in mobilising / demobilising resources.

7.5 Trackside Systems



There are two main forms of maintenance within Trackside systems, being preventative and corrective maintenance. These are defined as:

Preventative Maintenance

Preventative maintenance Is maintenance that is undertaken on equipment at regular programmed intervals to maximise its availability and reliability. In the TSMS database assets are categorised into asset classes with each asset class including various types of equipment. For each piece of equipment up to five scheduled maintenance services may apply (known as A, B, C, D and E services). Each of these services has a check sheet that details the activities undertaken.

Corrective Maintenance

Corrective maintenance involves actions performed as a result of failure to restore an item or asset to its predetermined condition (as far as possible). Corrective maintenance is also known as repair or unplanned maintenance. The factors that cause assets to fail are many. Corrective maintenance can be classified into two forms, immediate and deferred corrective maintenance.

7.5.1 Signalling

Activities included under signalling maintenance are those that relate to the overall performance of the signalling infrastructure. These activities ensure that the signalling system is maintained to a safe and appropriate operating level.

Product T28: Preventative Signalling Maintenance

This involves the preventative maintenance of field equipment associated with signalling control including cabling. This activity takes up approximately 30% of the time of the trackside system teams and primarily involves maintenance of signalling systems assets.

Table T28-1 below shows the breakdown of costs planned for the 15/16 FY. Table T28-2 shows the forecast for five years.

Table T28-1 - Preventative Signalling Maintenance (2015/16)

T28	Total Internal Labour	Total Internal Plant	Total External Costs	Total Consumable Component	Total
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	$853,358.48

T28-1 - Preventative Signalling Maintenance (nominal $)

T28	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Product T29: Corrective Signalling Maintenance

This involves the corrective maintenance of field equipment associated with signalling control including cabling. A significant proportion of signalling equipment is maintained on a 'fix on failure' basis, as a result there is a requirement to have a 24/7 callout roster in place.

Table T29-1 below shows the breakdown of costs planned for the 15/16 FY. Table T29-2 shows the forecast for five years. The current level of maintenance is estimated to reduce over the term of this undertaking as life expired systems are replaced capitally.

Table T29-1 - Corrective Signalling Maintenance (2015/16)

T29	Total Internal Labour	Total Internal Plant	Total External Costs	Total Consumable Component	Total
Rosewood – Columboola	[redacted]	[redacted]	[redacted]	[redacted]	**$246,408.24**

Table T29-2 - Corrective Signalling Maintenance (nominal $)

T29	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Product T53: Level Crossing Protection

This involves the scheduled maintenance and repair of level crossing protection installations including pedestrian gates.

Table T53-1 below shows the breakdown of costs planned for the 15/16 FY. Table T53-2 shows the forecast for five years.

Table T53-1 - Level Crossing Protection (2015/16)

T53	Total Internal Labour	Total Internal Plant	Total External Costs	Total Consumable Component	Total
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	$533,970.32

Table T53-2 - Level Crossing Protection (nominal $)

T53	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Product T58: Cable Route Maintenance

This involves the maintenance and repair of cableways, markers, troughing, cable pits and cables with the exception of fibre testing and repairs.

Table T58-1 below shows the breakdown of costs planned for the 15/16 FY. Table T58-2 shows the forecast for five years.

Table T58-1- Cable Route Maintenance (2015/16)

T58	Total Internal Labour	Total Internal Plant	Total External Costs	Total Consumable Component	Total
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	$204,042.80

Table T58-2 - Cable Route Maintenance (nominal $)

T58	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Product T62: Train Protection Systems Maintenance

Activities include investigations into performance issues in relation to the Automatic Train Protection (ATP), replacement of faulty transponders and adjustment of radio levels.

The below table shows a forecast of costs for the next five years.

Table T62-1 - Train Protection Systems Maintenance (nominal $)

T62	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Product T63: Wayside Monitoring Systems Maintenance

Maintenance and repair of trackside monitoring and measuring equipment such as Dragging Equipment Detectors (DEDs), Hot Bearing Detectors (HBDs), Wheel Impact Load Detectors (WILDs), weather monitors, out-of-gauge detectors and level crossing monitors.

Table T63-1 below shows the breakdown of costs planned for the 15/16 FY. Table T63-2 shows the forecast for five years.

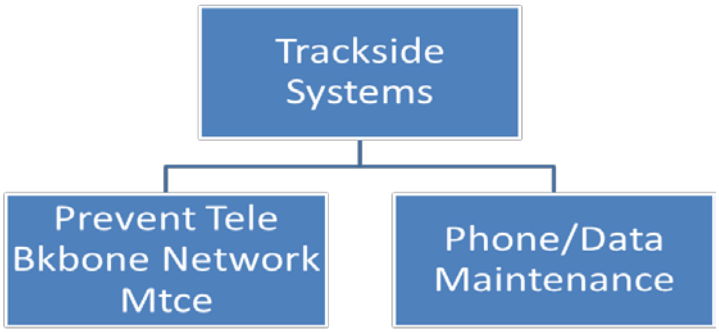
Table T63-1 - Wayside Monitoring Systems Maintenance (2015/16)

T63	Total Internal Labour	Total Internal Plant	Total External Costs	Total Consumable Component	Total
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	$57,298.80

Table T63-2 - Wayside Monitoring Systems Maintenance (nominal $)

T63	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

7.5.2 Telecommunications



Products included under telecommunication maintenance are those that relate to the overall performance of the telecommunications infrastructure. These products ensure that the telecommunication system is maintained to a safe and appropriate operating level.

Product T10: Preventative Telecommunications Backbone Maintenance

This includes preventative maintenance of the major bearer systems and infrastructure providing bandwidth for voice and data services as well as the base network for train control and maintenance radio systems.

This product consists typically of labour for preventative maintenance and ensuring the systems are running efficiently. This product is calculated as an allocation to the West Moreton Network of the overall backbone maintenance of Queensland Rail.

Table T10-1 shows the forecast costs for the next five years.

Table T10-1 - Preventative Telecommunications Backbone Maintenance (nominal $)

T10	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Product T13: Phone and Data Maintenance

Installation, moves or changes to phone and fax services including horizontal cabling installation, moves or changes to tail modem links, horizontal cabling and dumb terminal equipment for mainframe and Local Area Network (LAN) services.

Table T13-1 shows the forecast costs for the next five years.

Table T13-1 - Phone and Data Maintenance (nominal $)

T13	2015/16 ($'000)	2016/17 ($'000)	2017/18 ($'000)	2018/19 ($'000)	2019/20 ($'000)
Rosewood - Columboola	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

8. Total Maintenance Costs

The maintenance program has been developed by Queensland Rail for the West Moreton Network for the reference tariff period.

It should be noted that no provision for derailments or flooding events has been made in the forecast maintenance costs below. Should a significant event occur, Queensland Rail may need to either submit a review event reference tariff variation, in accordance with clause 5 of schedule A of the 2015 DAU, or request a one-off contribution from end-users.

Table 8.1 below summarises the total forecast maintenance costs by activity grouping for the 2015 DAU period. The costs are in nominal dollar terms.

Table 8.1: Total Maintenance Costs – (nominal $'000)

West Moreton Coal Maintenance	2015/16	2016/17	2017/18	2018/19	2019/20
Asset Management	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Structures	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Track (excluding Mechanised Resleepering)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Mechanised Resleepering	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Trackside Systems	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
TOTAL	**41,102**	**22,396**	**29,628**	**23,111**	**26,728**

8.1 Maintenance Costs Summary by Activity Grouping

Below are the summary tables for each activity grouping.

8.1.1 Asset Management

The allocations are outlined in the following table:

Table 8.2: Maintenance Costs Asset Management (nominal $'000)

Asset Management	2015/16	2016/17	2017/18	2018/19	2019/20
Inventory Mgt & Fixed Asset Stocktakes	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Consulting/Technical Advice	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Asset Management	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Project Mgmt & Services	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
TOTAL	**1,227**	**1,271**	**1,322**	**1,375**	**1,430**

8.1.2 Structures

The allocations are outlined in the following table:

Table 8.3: Maintenance Costs Structures (nominal $'000)

Structures	2015/16	2016/17	2017/18	2018/19	2019/20
Repairs Concrete Bridges	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Repairs Steel Bridges	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Repairs Timber Bridges	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Steel Bridge Paint (Contract)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Structures Inspections	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Structures Pest Control	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Drainage construction	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Drainage maintenance	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Retaining wall maintenance	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
TOTAL	**3,293**	**2,086**	**8,810**	**2,134**	**4,049**

8.1.3 Track (excluding Mechanised Resleepering)

The allocations are outlined in the following table:

Table 8.4: Maintenance Costs Track (nominal $'000)

Track	2015/16	2016/17	2017/18	2018/19	2019/20
Ballast Undercutting (Other)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Earthworks - Non Formation	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Fencing	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Rail Joint Management	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Rail Renewal	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Turnout Maintenance	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Mechanised Resurfacing	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Mech Resurfacing - Turnouts	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Rail Grinding - Mainline	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Rail Grinding - Turnouts	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Minor Yard Maintenance	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Track Geometry Recording	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Ultrasonic Test Ontrack Machine	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Monument /Signage Maintenance	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Track	2015/16	2016/17	2017/18	2018/19	2019/20
Maintenance Ballast	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Sleeper Management	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Fire & Vegetation Management	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Rail Stress Adjustment	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Ultra Sonic Testing (Manual)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Track Inspections	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Rail Lubrication	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Top & Line Spot Resurfacing	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Rail Repair	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Level crossing maintenance	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Level crossing constr/recond.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
TOTAL	**17,534**	**16,871**	**17,255**	**17,287**	**18,856**

8.1.4 Mechanised Resleepering

The allocations are outlined in the following table:

Table 8.5: Maintenance Costs Mechanised Resleepering (nominal $'000)

Track	2015/16	2016/17	2017/18	2018/19	2019/20
Mechanised Resleepering	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Total	**16,987**	**0**	**0**	**0**	**0**

Trackside Systems

The allocations are outlined in the following table:

Table 8.6: Maintenance Costs Trackside Systems (nominal $'000)

Track	2015/16	2016/17	2017/18	2018/19	2019/20
Prevent Tele Bkbone Ntwrk Mtce	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Phone/Data Maintenance	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Prevent Signalling Field Mtce	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Correct Signalling Field Mtce	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Signalling Level Xing Protect	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Cable Route Maintenance	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Signalling Train Protect System	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Wayside Monitoring System Mtce	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Total	**2,060**	**2,168**	**2,241**	**2,315**	**2,393**

Appendix 5 – Impact of Metropolitan Network Constraints on West Moreton Network Capacity

Appendix 5

Impact of Metropolitan Network Constraints on West Moreton Network Capacity

May 2015

Table of Contents

1. Purpose of assessment

As part of its 2015 DAU, Queensland Rail has proposed that, consistent with previous practice, a reduction will be applied to the allocation of pre-1995 asset values to coal services to reflect the impact on West Moreton Network capacity due to Metropolitan Network constraints.

This Appendix sets out details of the methodology used by Queensland Rail to determine this capacity impact.

2. Methodology for calculating capacity impact

There is general consensus from stakeholders that the most appropriate way to assess the impact of the Metropolitan Network is to analyse the capacity of the West Moreton Network with and without the constraints imposed by passenger services in the Metropolitan Network.

Capacity assessments can be undertaken based on either a theoretical or an operational view of capacity. The theoretical capacity of a rail line reflects the maximum number of train paths that can be scheduled on the railway (which can be assessed either before or after allowance is made for maintenance closures), while the operational capacity of the rail line takes account of the fact that a robust rail system will not operate train services on all available paths given the need to maintain some 'reserve paths' to recover from operational variability and unplanned events.

Historically, Queensland Rail has sought to assess the extent to which metropolitan constraints influenced West Moreton Network capacity based on analysis of time periods where coal and freight services were restricted from operations through the Metropolitan Network. However, given the level of debate about the reasonableness of Queensland Rail's assessment of the times that coal and freight services could not operate, Queensland Rail has altered its approach to a detailed path based assessment, which focuses on identifying the specific paths that are able to be scheduled through the Metropolitan Network. However, when undertaking this type of path based analysis, trying to assess the specific impact on operational capacity is problematic, as it is not possible to definitively identify whether certain paths are scheduled as unused due to Metropolitan Network constraints or whether they are held in reserve to ensure operational robustness of the West Moreton Network. In fact, it is Queensland Rail's view that, from an operational perspective, the real impact of the metropolitan constraints is negligible, as the paths that are sterilised due to the Metropolitan Network can effectively be used as the reserve paths (noting that reserve paths would still be required regardless of the Metropolitan Network constraints).

The QCA's consultant, B&H, noted that the most robust way of assessing the capacity impact of the Metropolitan Network would be through undertaking dynamic simulation, extended over a long period. However, noting that this form of analysis is not currently available, considered that the most rigorous available approach is to assess the impact of the Metropolitan Network on the theoretical capacity of the West Moreton Network – that is, the maximum number of train paths that can be scheduled on the railway.

Queensland Rail notes that dynamic simulation can be very useful in confirming operating capacity. In the context of the central Queensland network, where train services operate on a cyclic basis with substantial daily variation in train origins and destinations, we believe that

dynamic simulation is essential in assessing operating capacity. However, in a timetabled system – such as the Metropolitan and West Moreton Networks – the role of dynamic simulation is more to test the robustness of the timetable given reasonably anticipated operational variability. In this context, Queensland Rail is very confident that its timetable, including the identified paths through the Metropolitan Network for coal and freight trains, is robustly operable. This simply reflects that Queensland Rail has been operating to this timetable for a significant time period. As a result, while dynamic simulation may provide some additional support for Queensland Rail's assessment of operational capacity, Queensland Rail does not think that it is essential in order to demonstrate the capacity impact of Metropolitan Network constraints.

Further, the QCA's consultant B&H has advised Queensland Rail that it is satisfied that a theoretical capacity analysis will be an acceptable approach to demonstrate the capacity impact on the West Moreton Network.

In the QCA's consultation on this issue, stakeholders have expressed a range of views on the extent to which the Metropolitan Network limits the available capacity on the West Moreton Network, however little evidence has been provided to support their assertions. Therefore, for the 2015 DAU, Queensland Rail has prepared a range of train diagrams in order to unequivocally demonstrate the extent to which the Metropolitan Network constrains West Moreton Network theoretical maximum capacity.

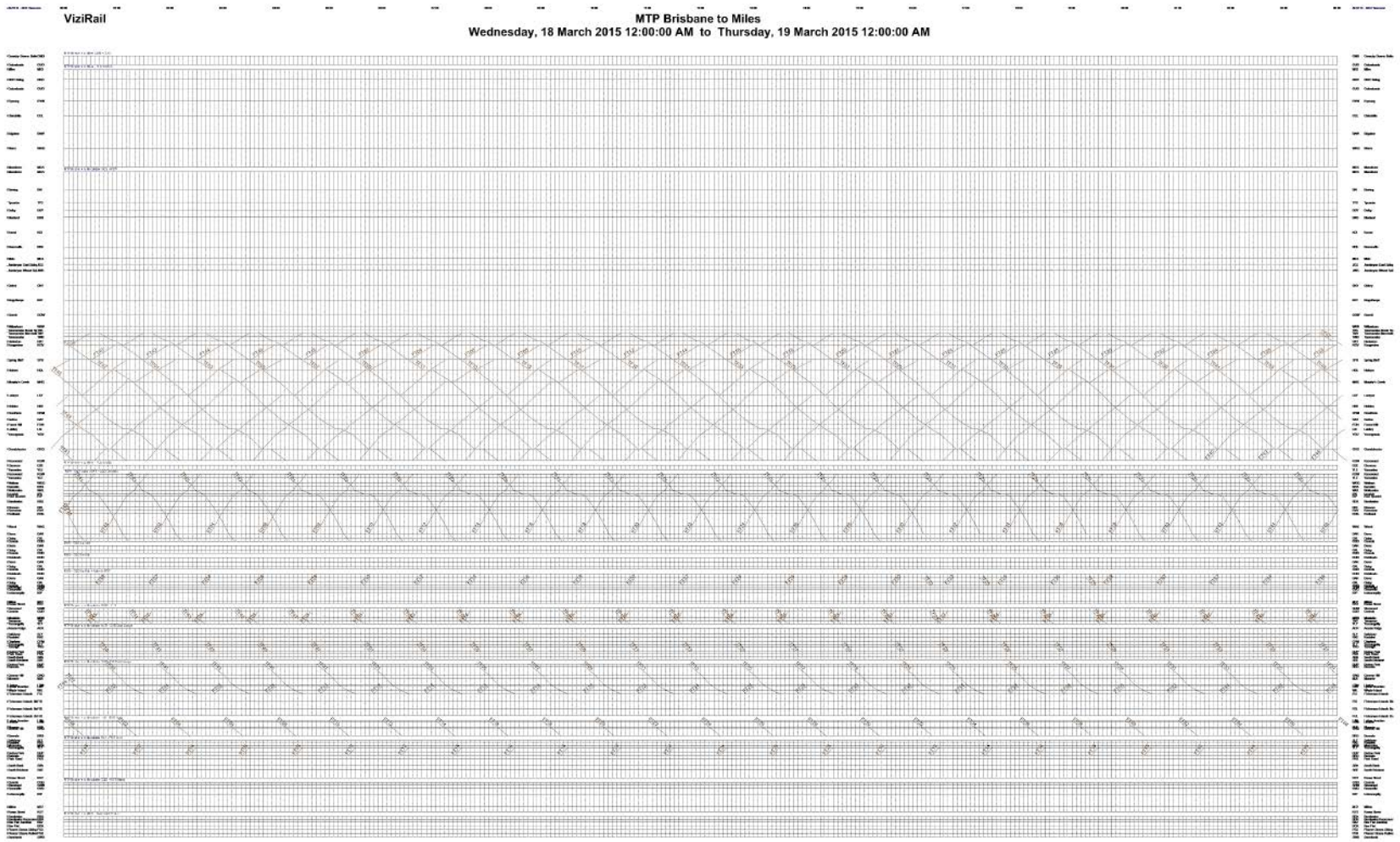
2.1 Theoretical capacity

The theoretical capacity of the West Moreton Network (excluding Metropolitan Network impacts) is assessed based on a rounded 30 minute run time for the longest section. While the precise running time of the longest section on the Toowoomba range is 26.5 minutes, given the variability in speed profiles of trains, it is considered that a scheduling interval of 30 minutes reflects a realistic and practical approach. This remains unchanged from Queensland Rail's previous analyses, and was accepted as the appropriate approach by the QCA's consultant, B&H.[1]

This gives a maximum number of one way paths that can be scheduled on the West Moreton Network in a 24 hour period as 48, with a maximum of 336 one way paths able to be scheduled in a one week period. This is demonstrated on Figure 1, which illustrates the 48 one way paths (24 loaded and 24 unloaded) that are available on the West Moreton Network alone over 24 hours. (Note, the diagram shows the available paths from Fisherman Islands to Toowoomba, as these are the critical areas of the route from a capacity planning perspective.)[2]

[1] B&H Report for consultation paper, Appendix 3,
[2] Note, all train diagrams shown in this Appendix can be separately provided as high resolution PDF documents on request.

Figure 1 Available paths on West Moreton Network (no passenger services)



Weekday Capacity without Metro Passenger services

To be deducted from this is the paths that are eliminated due to the closure of the track for maintenance or capital works. From a capacity planning perspective, Queensland Rail considers that 19 hours per week is a reasonable expectation of the track possessions required for maintenance in the West Moreton Network. Queensland Rail notes that this assumption was accepted by the QCA's consultant, B&H.

Based on this, the theoretical capacity (after maintenance) of the West Moreton Network is:

Table 1 West Moreton theoretical capacity (after maintenance)

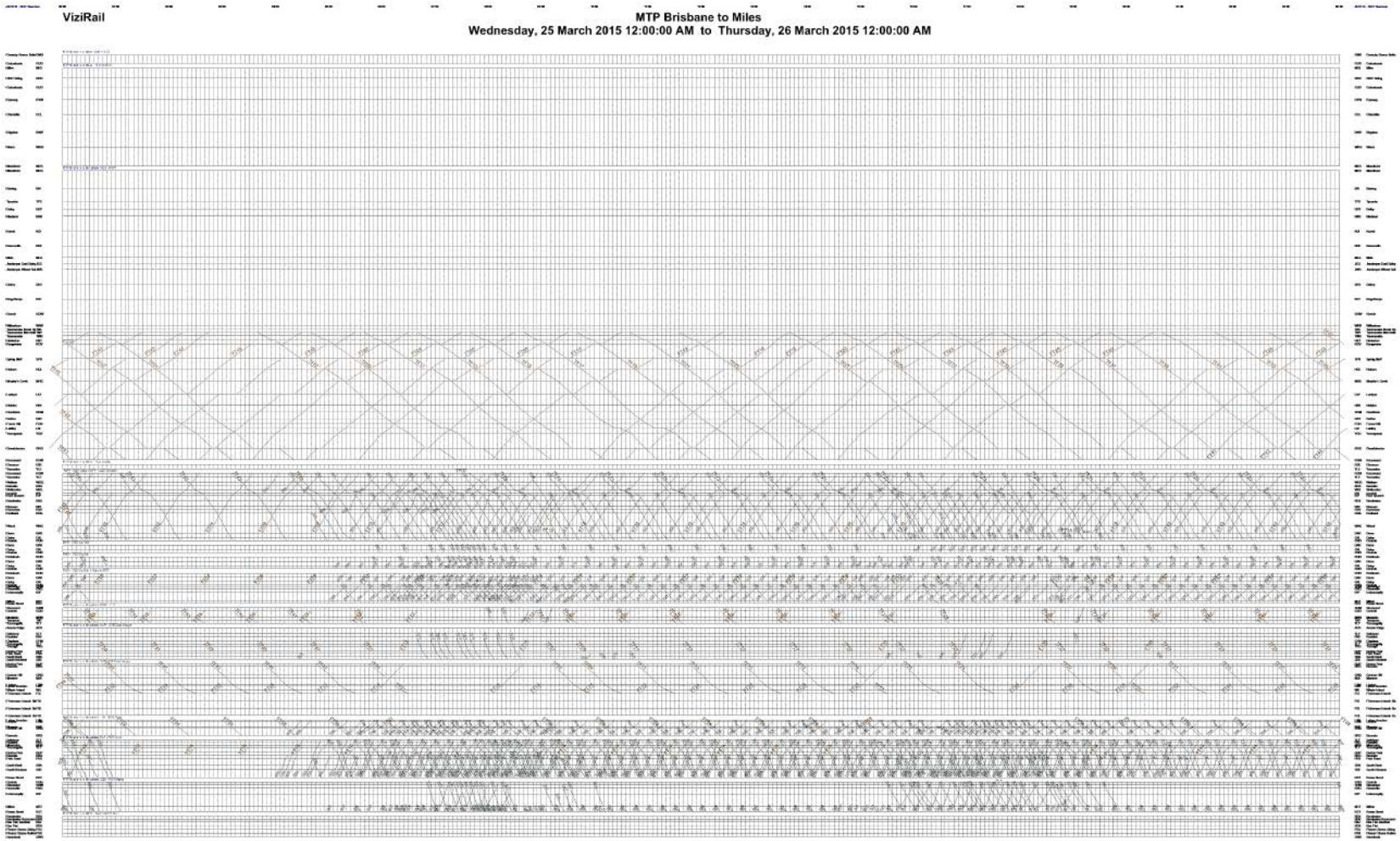
	One-way paths/week
West Moreton total theoretical capacity	336
West Moreton maintenance closures	38
West Moreton theoretical capacity (after mtce)	298

2.2 Passenger peak period impacts

The Metropolitan Network operates as a timetabled system, so it is a reasonably straightforward process to assess the number of paths that Queensland Rail can theoretically schedule on the West Moreton Network and then overlay this onto the passenger timetable to assess which paths are unable to be used due to conflicts with metropolitan passenger peaks.

Figure 2 shows that, based on the current weekday passenger timetable, there are 42 one way paths (21 loaded and 21 unloaded) that can be scheduled over the West Moreton Network each day including linkages to/from Port of Brisbane. This reflects a loss of 3 loaded and 3 unloaded paths, due to the inability to link West Moreton paths with a continuous path through the Metropolitan Network. Of these, 2 loaded and 1 unloaded paths are lost in the morning peak period and 1 loaded and 2 unloaded paths lost in the evening peak period. This diagram confirms the analysis described in Queensland Rail's response to the QCA's 2014 consultation paper, which concluded that only 3 loaded and 3 unloaded services per weekday were unable to operate due to conflicts with timetabled passenger services.

Figure 2 Available paths on West Moreton Network with Metropolitan passenger services (weekday timetable



Weekday Capacity with Metro Passenger services

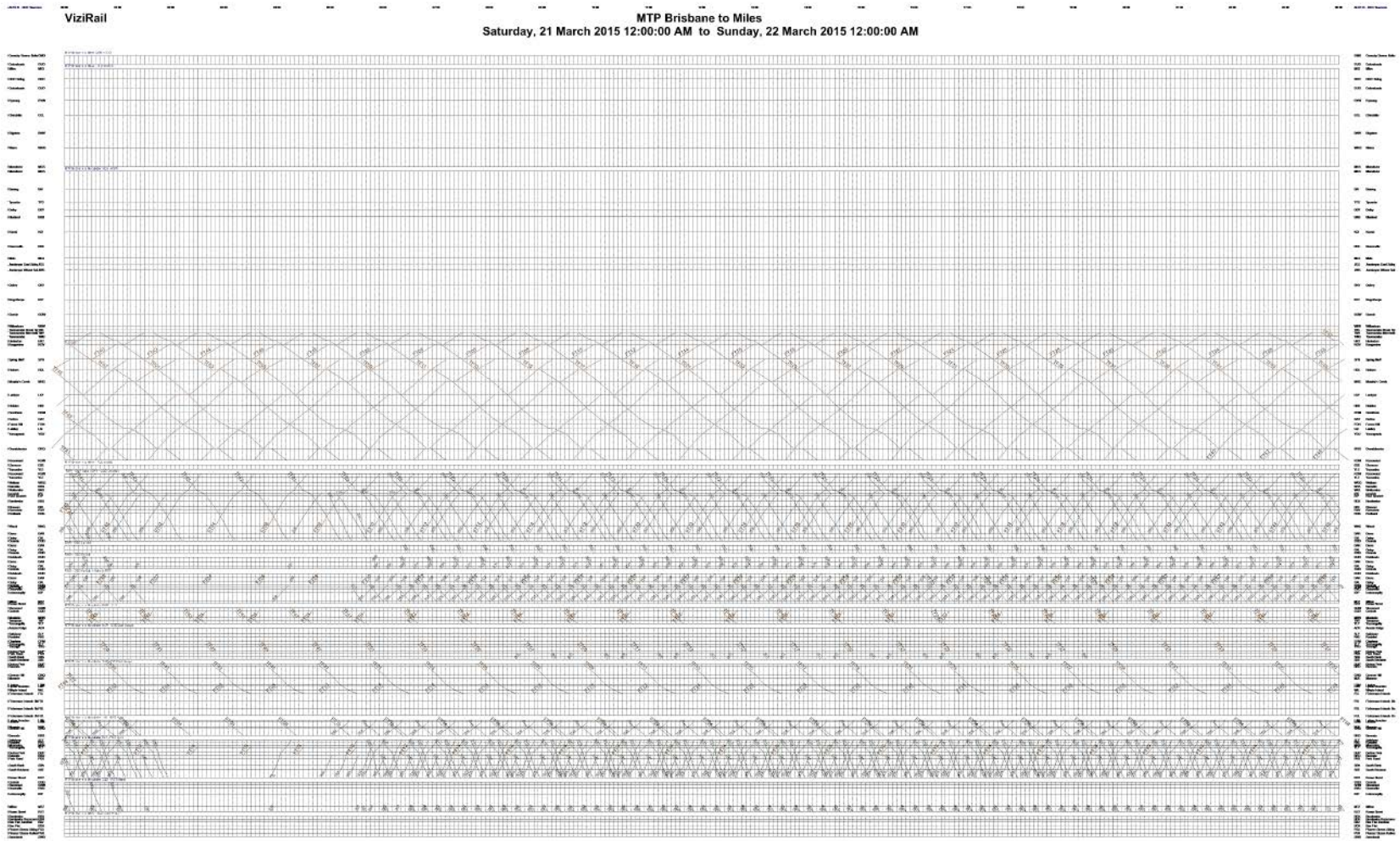
This diagram demonstrates that, notwithstanding the concerns identified by New Hope in relation to the effect of the mobilisation of passenger trains before and after the peak periods, the 'shoulder' periods do not prevent the scheduling of West Moreton services through the Metropolitan Network. Therefore, New Hope's claims that the length of the peak periods should be extended to include the time required for fleet mobilisation are unfounded.

Further, the diagram shows that, although at times, the time period between trains may vary by more or less than an hour (particularly through the Metropolitan Network), contrary to the concern raised by B&H in its report to the QCA, this variability does not in fact cause an overall loss in available paths. While it is vital that, at the critical section, trains running in the same direction operate at an interval of one hour, this interval does not need to be perfectly maintained along all sections of their journey. It may be the case that one train is delayed at some point in its journey, but the following train is not delayed at the same point, meaning that the subsequent train will then be running at a closer interval. Provided that all trains are able to operate on a linked path through the West Moreton and Metropolitan Networks, then variability in train intervals does not in itself cause a loss in theoretical capacity.

Figure 3 shows that, based on the Saturday passenger timetable, the full 48 West Moreton Network paths can be scheduled through the Metropolitan Network on a standard weekend day. The Sunday passenger timetable includes some further reduction in passenger services, and similarly allows for the full 48 West Moreton Network paths to be scheduled.[3]

[3] The Sunday train diagram can be provided to the QCA on request

Figure 3 Available capacity on West Moreton Network with metropolitan passenger services (Saturday timetable)



2

Saturday Capacity Diagram with Metro Passenger

As can be seen from these diagrams, over the period of a week, the reductions to theoretically available paths due to scheduling conflicts with passenger services are 15 loaded and 15 unloaded paths per week, giving a total loss of 30 one way paths.

Consistent with this analysis of theoretical capacity, in the operational environment Queensland Rail does schedule a limited number of coal and freight services to operate during the morning and afternoon peak periods. Figures 4 and 5 show Queensland Rail's current MTP train schedule for two consecutive days (Wednesdays and Thursdays). It can be seen that, on Thursdays, Queensland Rail schedules a coal service on the TF27 path during the afternoon peak. On Wednesdays, Queensland Rail schedules a loaded coal service on the TF01 path, just prior to the morning peak. While Queensland Rail does not routinely schedule empty coal services on the FT12 path through the morning peak, this can occur if required. Further, this path is certainly used in the event that a train scheduled on the earlier path is delayed – that is, it is treated primarily as a reserve path retained for operational robustness.

Figure 4 Current Wednesday Master Train Plan

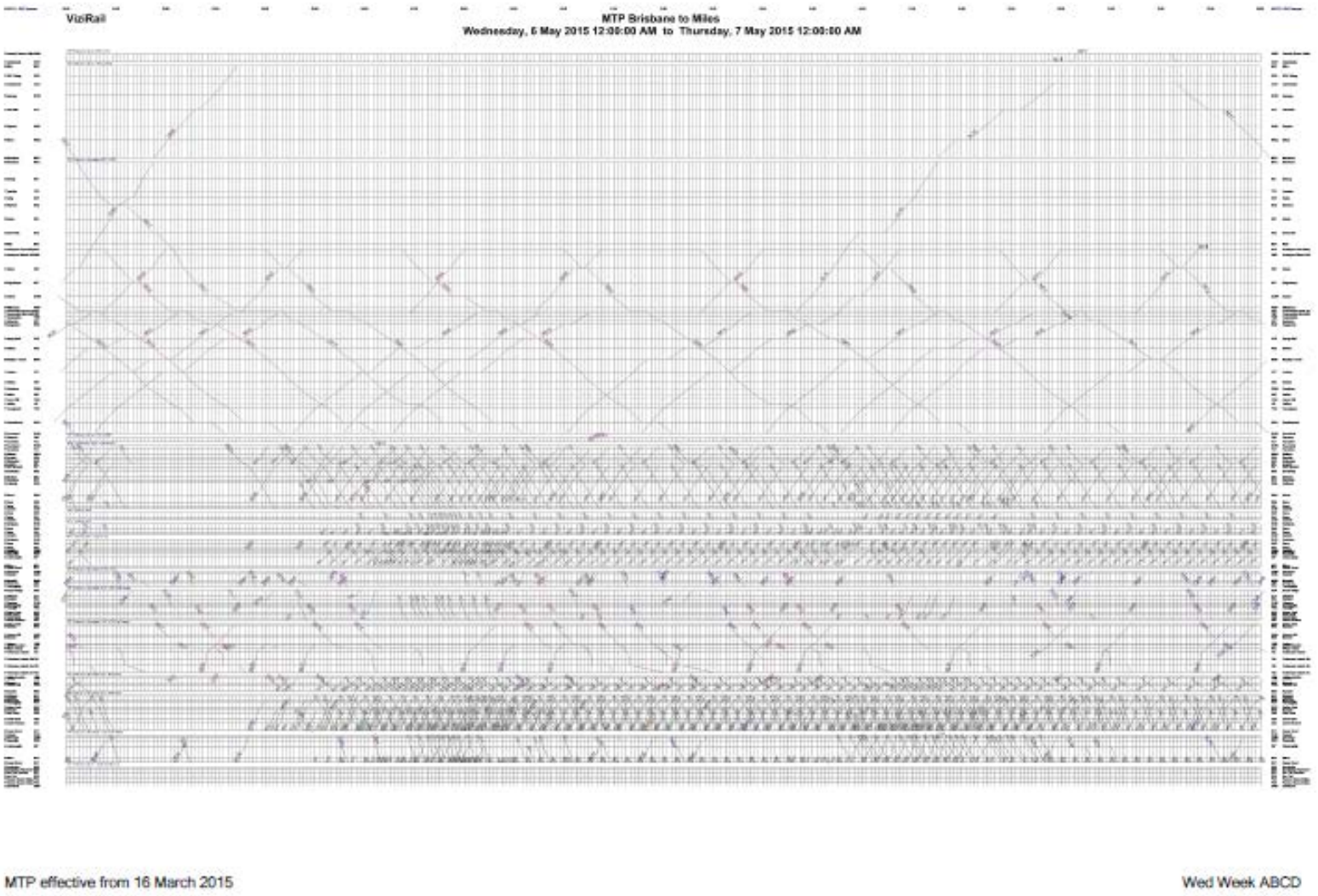
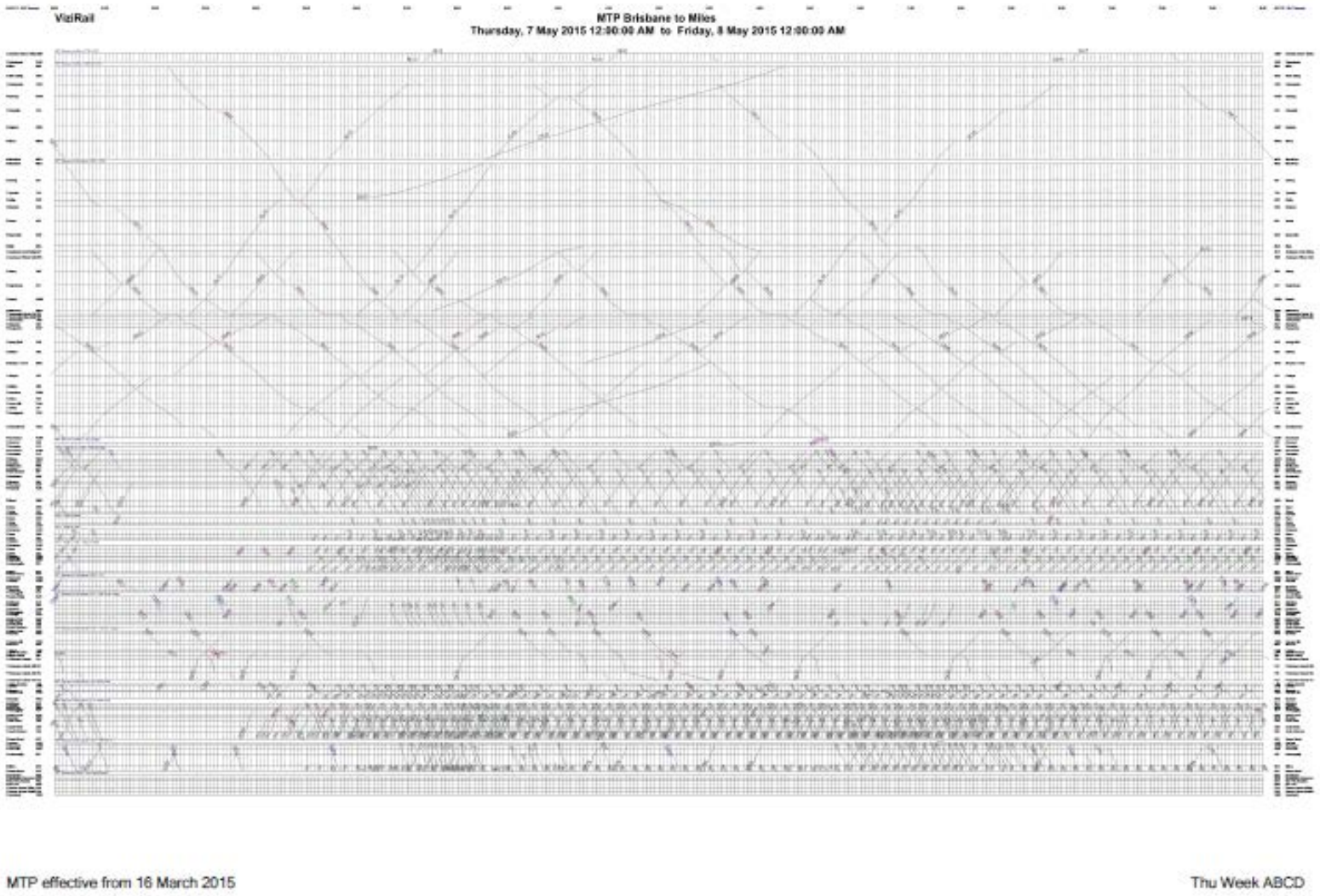


Figure 5 Current Thursday Master Train Plan



It is also interesting to note from these diagrams that, for the major coal customer on the West Moreton Network, the primary scheduling constraint is actually the train loading facility. As can be seen in the MTP diagrams, given the time required for train loading, the Metropolitan Network peak hour restrictions do not cause any 'shadow' reduction in utilisation of this loading facility.

2.3 Maintenance impacts

Four years ago, the track closure regime in the Metropolitan Network was substantially revised in order to maximise Queensland Rail's productive access to the track in order to undertake necessary maintenance work while minimising the impact on passenger services. As a result, Queensland Rail has replaced its previous regime of regular short closures of individual track segments with less regular, but longer closures of full corridors within the Metropolitan Network. Queensland Rail now fully closes one corridor within the Metropolitan Network for 48 hours approximately every second week, with each corridor closed on 1-4 weekends each year. However, due to the need for West Moreton train services to traverse multiple corridors, this track closure regime results in access to a continuous path from Rosewood to Port of Brisbane being unavailable for a 48 hour weekend closure approximately each fourth week.

The maintenance closure program for the West Moreton Network, over a four week cycle, is as follows:

- Week A – 48 hour closure on Saturday and Sunday
- Week B – no maintenance possessions
- Week C – 12 hour closure on Sunday
- Week D – 12 hour closure on Monday

While the order in which the Week A-D closures occur is not rigidly applied, Queensland Rail ensures that, over time, an even number of Weeks A, B, C and D occur. This is evidenced by the Western Corridor Alignment Calendars which identify the closure regime applied each week – these are provided at Attachment 1(actual planned - Sep-Dec 2014) and 2 (planned – April 2014-Dec 2015).

Week A closures are the critical issue in terms of alignment between the West Moreton and Metropolitan Networks. Week C and D closures are required for West Moreton maintenance alone, and do not typically correspond with metropolitan closures (although at times some track closures will occur on the Metropolitan Network in C Weeks, given the absence of coal and freight trains).

Queensland Rail's Supply Chain South and Network SEQ groups strategically plan their maintenance and capital works activities through the SCAS (Scheduled Corridor Access System) co-ordination forum up to 18 months in advance to ensure that 'Week A' closures of the West Moreton Network and the relevant weekend Metropolitan Network closures are complementary. This is demonstrated by the Western Corridor Alignment Calendars shown at Attachments 1 and 2. These calendars show that every Metropolitan Network weekend closure affecting West Moreton trains is matched by a Week A closure on the West Moreton Network.

Some maintenance work does continue to be done in both the West Moreton and Metropolitan Networks outside the standard Week A-D and weekend corridor closures. However, where work

is being undertaken in the Metropolitan Network, careful planning ensures that this work is undertaken in such a way as to leave a track open to continue to run West Moreton services (potentially under speed restriction or on an Alternate Proceed Authority which would result in some delays but no cancellations).

Co-ordination of closures and maintenance activities continues as the closure dates approach. Any potential change to planned closures sought for either the West Moreton or Metropolitan Networks needs to be reviewed by both groups, with changes only implemented if agreed. This occurs through regular meetings of the SCAS co-ordination group (SCAS COG). Minutes of the February 2015 meeting are provided at Attachment 3, as an example of the outcomes of this process. These minutes show the extent to which the groups plan their capital and maintenance work to fit within the available closures. They also show that requests for variation to closures will not proceed unless acceptable to both groups – for example, at the February 2015 meeting, a request for a change to a metro weekend closure was rejected as it would result in two 'A week' closures on the West Moreton Network in July 2015.

In order to demonstrate how this process translates to actual closures, Queensland Rail has provided the SCAS calendar for the period August-December 2014 as Attachment 4. This shows the planned track closures in the metropolitan region, and from this it can be seen how the weekend closures affecting the West Moreton services (Western Corridor, Gold Coast Line and Cleveland Line) line up with the 'A Weeks' (as the freight closure program is identified at the top of the calendar). Some additional full closures of the metropolitan Western Corridor occurred on 'C weeks' (eg 28 September 2014), which aligned with the pre-existing closure of the West Moreton Network. It can also be seen that other planned maintenance works on the relevant corridors are done in such a way as to allow continued operation of coal and freight services (eg weeknight closures of the Western Corridor from 8-12 September 2014). Maintenance work that occurs outside the planned SCAS closures is minor routine work and is generally done in available natural windows, hence does not cause cancellation of trains.

As noted by B&H, maintenance work in the West Moreton Network is generally done in daylight hours. Therefore, theoretically the West Moreton Network could operate with two 12 hour closures on a single weekend, rather than a 48 hour closure. However, Queensland Rail uses these longer closures to maximise its productivity in performing work that takes multiple days to perform. If Queensland Rail were to reinstate the track for night time running, this would reduce the time available for maintenance (as it would need to remove all equipment and reinstate the track for safe travel) meaning that further closures would subsequently be required to complete the work.

Queensland Rail does acknowledge, however, that it typically will only require a 36 hour closure to perform these works (Saturday morning to Sunday evening) rather than the full 48 hour closure applied in the Metropolitan Network. This resulting standard closure regime for the West Moreton Network (with one 36 hour closure and two 12 hour closures each week) comfortably fits within the planning allowance of 19 hours per week, and allows some additional margin for where closures in excess of the standard allowance are required.

The extension of the weekend closure by an additional 12 hours once each four weeks can therefore be attributable to Metropolitan Network maintenance requirements in excess of West Moreton maintenance requirements. This equates to an average of 3 hours per week of additional closures triggered by the Metropolitan Network, which in turn impacts on an average of 6 one way paths per week. This impact is demonstrated in Attachment 5 which shows the

additional paths that could be operated in the West Moreton Network over the Saturday-Monday period under a 36 hour closure.

2.4 Summary of total impact

The total impact of metropolitan peak periods and additional Metropolitan Network maintenance on the theoretical capacity of the West Moreton Network can be summarised as follows:

Table 2 Impact of Metropolitan Network constraints on West Moreton Network theoretical capacity

	One-way paths/week	
West Moreton theoretical capacity (after mtce)		298
Unavailable due to Metropolitan Network		36
Peak periods restrictions	30	
Additional metropolitan maintenance	6	
Total available paths (after metro impact)		262
% Unavailable due to metro impact		12.1%

Queensland Rail notes that, when B&H performed its analysis of Metropolitan Network constraints for the QCA's 2014 Consultation Paper, it applied a similar analysis to that described here. However, that analysis contained some errors (eg, B&H assessed the total theoretical capacity of the West Moreton Network as 326 rather than 336). There were also some incorrect assumptions – in particular, B&H's assumption of only 60% overlap between the metropolitan and West Moreton Network closures). In addition, B&H made a final adjustment in order to reflect Queensland Rail's assessed 'inefficiency' in the use of operational (rather than theoretical) capacity.

As discussed previously, operational capacity (that is, the capacity that Queensland Rail considers can reliably be provided after allowing for operational variability) is invariably less than theoretical capacity, as some paths need to be held as 'reserve paths' to ensure robust system operation. In the West Moreton Network, this allowance is as follows:

Table 3 West Moreton Network operating capacity

	One-way paths/week
West Moreton theoretical capacity (after mtce)	298
Unavailable due to Metropolitan Network	36
Total available paths (after metro impact)	262
Maximum contracting capacity[4]	224
Additional reserve paths (total available less maximum contracting capacity)	38

Retention of a level of reserve capacity to manage operational variability is universally applied by railway managers, and reflects good industry practice in order to ensure that the railway has sufficient capacity to reliably meet contracted entitlements. This should not be seen as an inefficiency in Queensland Rail's capacity management.

[4] As discussed in Queensland Rail's submission on the West Moreton reference tariff, Queensland Rail's maximum contracting capacity on the West Moreton Network is 112 return paths per week or 224 one way paths per week.

In B&H's analysis though, it appears to be mixing the concepts of theoretical and operational capacity, as while it describes is assessment as based on theoretical capacity, it has increased the assessed % impact on theoretical capacity to reflect the difference (in % terms) between theoretical and operational capacity – which B&H refers to as an inefficiency factor. This causes B&H's final assessed impact of the Metropolitan Network to be higher than its assessed impact on theoretical capacity. Queensland Rail considers that there is neither logic nor justification for this approach.

As a result, Queensland Rail has assessed the impact on West Moreton Network theoretical capacity due to Metropolitan Network constraints as being 12.1%.

As noted previously, it is Queensland Rail's view that, from an operational perspective, the real impact of the metropolitan constraints is less than this – indeed negligible - as the paths that are sterilised due to the Metropolitan Network can still effectively be used as reserve paths (noting that reserve paths would still be required regardless of the Metropolitan Network constraints).

Notwithstanding this, Queensland Rail proposes to reduce the allocation of pre-1995 assets to coal services to reflect the assessed 12.1% impact on theoretical capacity.

Attachment 1: Western Corridor Alignment Calendar – Sep-Dec 2014

QueenslandRail

WEEK TYPE
A = 48 HRS SAT/SUN
B = NIL POSSESSION
C = 12 HRS SUN
D = 12 HRS MON

48 Hour Closures
Conflicts
Maintenance Time Available
Recent Changes / Additions

QueenslandRail

Western Coal Supply Chain

Western Corridor Alignment Calendar 2014

NB: Only includes TOTAL CLOSURES Corinda to Roma Street

Last updated 26/08/14

Weekend	Week Type	Times	Location	Western	Suburban
SAT 30/08/2014	C				
SUN 31/08/2014	C	0630 Sun - 1730 Sun	Oakey - Jondaryan Coal Siding	Re-Conditioning	
		0630 Sun - 1730 Sun	Grandchester - Laidley	Signals	
		0630 Sun - 1730 Sun	Toowoomba Brook Street	Signals	
		0630 Sun - 1700 Sun	Helidon - Lockyer	Bridge Maintenance	
		0700 Sun - 1700 Mon	Tycanba - Macalister	Formation	
MON 01/09/2014	D	0630 Mon - 1730 Mon	Murphy's Creek - Rangeview	General Maintenance	
		0700 Sun - 1700 Mon	Tycanba - Macalister	Formation	
		0630 Mon - 1700 Mon	Helidon - Lockyer	Bridge Maintenance	
		0800 Mon - 1200 Mon	Grantham Yard	Contractor	
		0930 Mon - 1330 Mon	Murphy's Creek - Rangeview	Ballasting	
SAT 06/09/2014	D				
SUN 07/09/2014	D				No train period required is from 0400 to 0800 Cleveland Line Shutdown - Murrarie
Fri 12/09/2014	A	0630 Fri - 1730 Mon	Oakey - Jondaryan Coal Siding	Re-Conditioning	
		0630 Fri - 1730 Mon	Spring Bluff - Rangeview	Re-Railing	
		0630 Fri - 1700 Mon	Malu - Bowenville	Re-Conditioning	
		0615 Fri - 1745 Mon	Dalby - Tycanba	Bridge Maintenance	
		0615 Fri - 1745 Mon	Tycanba - Baining	Bridge Maintenance	
		0600 Fri - 1800 Mon	Rangeview - Willowburn	Signals	
		0600 Fri - 1300 Sat	Forest Hill - Gatton	Bridge Construction	
		0600 Fri - 0600 Tue	Fisherman Island		Fisherman Islands Coal Unloader Closure
SAT 13/09/2014	A		Ipswich Workshops - Gatton	TWRM Charter	
		0630 Fri - 1730 Mon	Oakey - Jondaryan Coal Siding	Re-Conditioning	
		0630 Fri - 1730 Mon	Spring Bluff - Rangeview	Re-Railing	
		0630 Fri - 1700 Mon	Malu - Bowenville	Re-Conditioning	
		0615 Fri - 1745 Mon	Dalby - Tycanba	Bridge Maintenance	
		0615 Fri - 1745 Mon	Tycanba - Baining	Bridge Maintenance	
		0600 Fri - 1800 Mon	Rangeview - Willowburn	Signals	
		0700 Sat - 1700 Sat	Grantham - Helidon	Bridge Maintenance	
		0600 Fri - 1300 Sat	Forest Hill - Gatton	Bridge Construction	
		1300 Sat - 2359 Mon	Forest Hill - Gatton	Bridge Construction	
		0600 Fri - 0600 Tue	Fisherman Island		Fisherman Islands Coal Unloader Closure
SUN 14/09/2014	A	0630 Fri - 1730 Mon	Oakey - Jondaryan Coal Siding	Re-Conditioning	
		0630 Fri - 1730 Mon	Spring Bluff - Rangeview	Re-Railing	
		0630 Fri - 1700 Mon	Malu - Bowenville	Re-Conditioning	
		0615 Fri - 1745 Mon	Dalby - Tycanba	Bridge Maintenance	
		0615 Fri - 1745 Mon	Tycanba - Baining	Bridge Maintenance	
		0600 Fri - 1800 Mon	Rangeview - Willowburn	Signals	
		0700 Sun - 1700 Sun	Grantham - Helidon	Bridge Maintenance	
		1300 Sat - 2359 Mon	Forest Hill - Gatton	Bridge Construction	
		0700 Sun - 1700 Sun	Ipswich - Rosewood		Wulkuraka Stabling Yard O/H modification works / Resleepering
		0600 Fri - 0600 Tue	Fisherman Island		Fisherman Islands Coal Unloader Closure

MON 15/09/2014	B	0630 Fri - 1730 Mon	Oakey - Jondaryan Coal Siding	Re-Conditioning	
		0630 Fri - 1730 Mon	Spring Bluff - Rangeview	Re-Railing	
		0630 Fri - 1700 Mon	Malu - Bowenville	Re-Conditioning	
		0615 Fri - 1745 Mon	Dalby - Tycanba	Bridge Maintenance	
		0615 Fri - 1745 Mon	Tycanba - Baining	Bridge Maintenance	
		0600 Fri - 1800 Mon	Rangeview - Willowburn	Signals	
		1300 Sat - 2359 Mon	Forest Hill - Gatton	Bridge Construction	
		0600 Fri - 0600 Tue	Fisherman Island		Fisherman Islands Coal Unloader Closure
SAT 20/09/2014	B		Roma Street to Toowoomba	Carnival of Flowers - 20th to 27th September 2014	Roma Street to Toowoomba Services running 20th, 21st and 24th. Toowoomba to Spring Bluff twice daily 21/9 to 26/9 and once 27/9
SUN 21/09/2014	B		Roma Street to Toowoomba	Carnival of Flowers - 20th to 27th September 2014	Roma Street to Toowoomba Services running 20th, 21st and 24th. Toowoomba to Spring Bluff twice daily 21/9 to 26/9 and once 27/9
SAT 27/09/2014	C		Roma Street to Toowoomba	Carnival of Flowers - 20th to 27th September 2014	Roma Street to Toowoomba Services running 20th, 21st and 24th. Toowoomba to Spring Bluff twice daily 21/9 to 26/9 and once 27/9
SUN 28/09/2014	C	0630 Sun - 1730 Sun	Oakey - Jondaryan Coal Siding	Re-Conditioning	
		0700 Sun - 1700 Sun	Tycanba - Baining	Re-Conditioning	
		0700 Sun - 1700 Sun	Ipswich - Rosewood		Wulkuraka Stabling Yard O/H modification works / Resleepering
MON 29/09/2014	D	0630 Mon - 1730 Mon	Murphy's Creek - Rangeview	General Maintenance	
		0700 Mon - 1700 Mon	Warra - Brigalow	Re-Conditioning	
SAT 04/10/2014	D				
SUN 05/10/2014	D				
MON 06/10/2014	A	LABOUR DAY			
SAT 11/10/2014	A	0200 Sat - 0230 Mon	Corinda - Rosewood		Ipswich Line Shutdown
		0630 Sat - 1730 Sun	Oakey - Jondaryan Coal Siding	Re-Conditioning	
		0630 Sat - 1700 Sun	Malu - Bowenville	Re-Conditioning	
		0600 Sat - 1800 Sun	Grandchester Yard	Signals	
		0700 Sat - 1700 Sat	Grantham - Helidon	Bridge Maintenance	
		0600 Sat - 0600 Mon	Fisherman Island		Coal Unloader Closure
SUN 12/10/2014	A	0200 Sat - 0230 Mon	Corinda - Rosewood		Ipswich Line Shutdown
		0630 Sat - 1730 Sun	Oakey - Jondaryan Coal Siding	Re-Conditioning	
		0630 Sat - 1700 Sun	Malu - Bowenville	Re-Conditioning	
		0600 Sat - 1800 Sun	Grandchester Yard	Signals	
		0600 Sat - 0600 Mon	Fisherman Island		Coal Unloader Closure
SAT 18/10/2014	B				
SUN 19/10/2014	B				
SAT 25/10/2014	C				
SUN 26/10/2014	C	0630 Sun - 1730 Sun	Oakey - Jondaryan Coal Siding	Re-Conditioning	
		0630 Sun - 1730 Sun	Tycanba - Baining	Re-Conditioning	
MON 27/10/2014	D	0630 Mon - 1730 Mon	Murphy's Creek - Rangeview	Re-Conditioning	
		0700 Mon - 1700 Mon	Tycanba - Baining	Re-Conditioning	
SAT 01/11/2014	D				
SUN 02/11/2014	D				

SAT 08/11/2014	A				Cleveland Line Shutdown
		0630 Sat - 1700 Sun	Malu - Bowenville	Re-Conditioning	
		0930 Sat - 1730 Sun	Laidley - Forest Hill	Re-Conditioning	
SUN 09/11/2014	A				Cleveland Line Shutdown
		0630 Sat - 1700 Sun	Malu - Bowenville	Re-Conditioning	
		0930 Sat - 1730 Sun	Laidley - Forest Hill	Re-Conditioning	
SAT 15/11/2014	B				
SUN 16/11/2014	B				
SAT 22/11/2014	C				
SUN 23/11/2014	C	0630 Sun - 1730 Sun	Oakey - Jondaryan Coal Siding	Re-Conditioning	
		0630 Sun - 1700 Sun	Malu - Bowenville	Re-Conditioning	
MON 24/11/2014	D	0630 Mon - 1730 Mon	Murphy's Creek - Rangeview	General Maintenance	
		0630 Mon - 1700 Mon	Malu - Bowenville	Re-Conditioning	
		0630 Mon - 1730 Mon	Willowburn - Gowrie	Re-Conditioning	
SAT 29/11/2014	D				
SUN 30/11/2014	D				
SAT 06/12/2014	C				
SUN 07/12/2014	C	0700 Sun - 1700 Sun	Grantham - Helidon	Formation	
		0700 Sun - 1700 Sun	Rosewood - Grandchester	Formation	
		0730 Sun - 1230 Sun	Oakey - Dalby	Ultrasonic Test Car	
SAT 13/12/2014	A	0001 Sat - 0300 Mon	Yeerongpilly		Beenleigh Line Shutdown
		0700 Sat - 1700 Sun	Malu - Bowenville	Formation	
		0700 Sat - 1700 Sun	Columboola - Rainby	Formation	
		0900 Sat - 1500 Sat	Helidon - Toowoomba	Ultrasonic Test Car	
		0930 Sat - 1730 Sun	Laidley - Forest Hill	Re-Conditioning	
SUN 14/12/2014	A		Ipswich Workshops - Grandchester	Ipswich Workshops to Grandchester Charter	
		0001 Sat - 0300 Mon	Yeerongpilly		Beenleigh Line Shutdown
		0700 Sat - 1700 Sun	Malu - Bowenville	Formation	
		0700 Sat - 1700 Sun	Columboola - Rainby	Formation	
		0730 Sun - 1530 Sun	Oakey - Helidon	Ultrasonic Test Car	
		0930 Sat - 1730 Sun	Laidley - Forest Hill	Re-Conditioning	
SAT 20/12/2014	B				
SUN 21/12/2014	B				
MON 22/12/2014	D	0630 Mon - 1730 Mon	Murphy's Creek - Rangeview	General Maintenance	
		0700 Mon - 1700 Mon	Rosewood - Grandchester	Re-Conditioning	
SAT 27/12/2014	D	0800 Sat - 1730 Sun	Spring Bluff - Rangeview	Re-Railing	
SUN 28/12/2014	D	0800 Sat - 1730 Sun	Spring Bluff - Rangeview	Re-Railing	

Attachment 2: Western Corridor Alignment Calendar – Apr 2015-Dec 2016

WEEK TYPE
A = 48 HRS SAT/SUN
B = NIL POSSESSION
C = 12 HRS SUN
D = 12 HRS MON

48 Hour Closures
Conflicts
Maintenance Time Available
Recent Changes / Additions

QueenslandRail

Western Coal Supply Chain

Western Corridor Alignment Calendar 2015

NB: Only includes TOTAL CLOSURES Corinda to Roma Street

Last updated 14/04/15

Weekend	Week Type	Times	Location	Western	Suburban
SAT 18/04/2015	C	0600 Sat - 2359 Tue	Malu - Bowenville	Drain Renewal	
		0600 Sat - 1800 Tue	Macalister - Brigalow	Bridge Maintenance	
SUN 19/04/2015	C	0600 Sat - 2359 Tue	Malu - Bowenville	Drain Renewal	
		0600 Sat - 1800 Tue	Macalister - Brigalow	Bridge Maintenance	
		0700 Sun - 1500 Sun	Rosewood - Yarongmulu	Ballasting	
		0800 Sun - 1215 Sun	Helidon - Toowoomba	NDT Car	
MON 20/04/2015	D	0600 Sat - 2359 Tue	Malu - Bowenville	Drain Renewal	
		0600 Sat - 1800 Tue	Macalister - Brigalow	Bridge Maintenance	
		0600 Mon - 1800 Tue	Malu Yard	Formation	
		0800 Mon - 1230 Mon	Toowoomba - Malu	NDT Car	
SAT 25/04/2015	D	1345 Sat - 1500 Sat	Kingsthorpe Yard	No Train Period	
SUN 26/04/2015	D				
SAT 02/05/2015	A	0200 Sat - 0300 Mon	Corinda - Rosewood		Ipswich Line Shutdown. Westlander stows Toowoomba
		0730 Sat - 1730 Sun	Blaxland - Dalby	Bridge Maintenance	
		0600 Sat - 1800 Sun	Oakey - Jondaryan Coal Siding	Re-Conditioning	
		0600 Sat - 2359 Sun	Holmes - Rangeview	Third Party	
		0600 Sat - 2359 Sun	Grandchester - Yarongmulu	Third Party	
		0630 Sat - 1730 Sun	Holmes - Spring Bluff	Re-Railing	
		0600 Sat - 1800 Sun	Columboola Yard	Level Crossing	
SUN 03/05/2015	A	0200 Sat - 0300 Mon	Corinda - Rosewood		Ipswich Line Shutdown. Westlander stows Toowoomba
		0730 Sat - 1730 Sun	Blaxland - Dalby	Bridge Maintenance	
		0600 Sat - 1800 Sun	Oakey - Jondaryan Coal Siding	Re-Conditioning	
		0600 Sat - 2359 Sun	Holmes - Rangeview	Third Party	
		0600 Sat - 2359 Sun	Grandchester - Yarongmulu	Third Party	
		0630 Sat - 1730 Sun	Holmes - Spring Bluff	Re-Railing	
		0600 Sat - 1800 Sun	Columboola Yard	Level Crossing	
SAT 09/05/2015	B				
SUN 10/05/2015	B				
SAT 16/05/2015	C				

SUN 17/05/2015	C	0600 Sun - 1830 Sun	Grandchester - Yarongmulu	Third Party	
		0600 Sun - 1800 Sun	Oakey - Jondaryan Coal Siding	Re-Conditioning	
		0630 Sun - 1800 Sun	Lockyer - Murphy's Creek	Bridge Maintenance	
MON 18/05/2015	D	0600 Mon - 1730 Mon	Grandchester - Yarongmulu	Third Party	
		0700 Mon - 1400 Mon	Laidley - Forest Hill	Rail Drop	
		0600 Mon - 1800 Mon	Lockyer - Murphy's Creek	Bridge Maintenance	
		0600 Mon - 1800 Mon	Yarongmulu - Laidley	Formation	
SAT 23/05/2015	D				
SUN 24/05/2015	D				
SAT 30/05/2015	C				
SUN 31/05/2015	C	0630 Sun - 1800 Sun	Toowoomba Brook Street - Willowburn	Re-Railing	
		0600 Sun - 1730 Sun	Grandchester - Yarongmulu	Third Party	
		0730 Sun - 1800 Sun	Baining - Macalister	Bridge Maintenance	
		0600 Sun - 1800 Sun	Baining - Macalister	Formation	
		0600 Sun - 2000 Sun	Yarongmulu - Laidley	Formation	
		0630 Sun - 1800 Sun	Forest Hill Yard	Undercutting	
		0700 Sun - 1700 Sun	Redbank - Ipswich		No Train Period
MON 01/06/2015	D	0630 Mon - 1800 Mon	Baining - Macalister	Bridge Maintenance	
		0700 Mon - 1730 Mon	Yarongmulu - Laidley	Re-Railing	
		0600 Mon - 1800 Mon	Toowoomba Brook Street - Willowburn	Welding	
		0600 Mon - 1800 Mon	Baining - Macalister	Formation	
SAT 06/06/2015	D				
SUN 07/06/2015	D				
MON 08/06/2015	C	QUEENS BIRTHDAY			
SAT 13/06/2015	C				
SUN 14/06/2015	C	0700 Sun - 1700 Sun	Redbank - Ipswich		No Train Period
SAT 20/06/2015	A	0600 Sat - 1800 Sun	Oakey - Jondaryan Coal Siding	Re-Conditioning	
		0600 Sat - 1800 Sun	Spring Bluff - Rangeview	Re-Railing	
		0030 Sat - 0030 Mon	Laidley - Forest Hill	Bridge Construction	Westlander stows Toowoomba
		0010 Sat - 0230 Mon	Park Road - Lytton Junction		Cleveland Line Shutdown
SUN 21/06/2015	A	0600 Sat - 1800 Sun	Oakey - Jondaryan Coal Siding	Re-Conditioning	
		0600 Sat - 1800 Sun	Spring Bluff - Rangeview	Re-Railing	
		0030 Sat - 0030 Mon	Laidley - Forest Hill	Bridge Construction	Westlander stows Toowoomba
		0010 Sat - 0230 Mon	Park Road - Lytton Junction		Cleveland Line Shutdown
SAT 27/06/2015	B				
SUN 28/06/2015	B				
SAT 04/07/2015	A	0200 Sat - 0300 Mon (Times TBC)	Corinda - Rosewood		Ipswich Line Shutdown. Westlander stows Toowoomba
		0030 Sat - 0030 Mon	Laidley - Forest Hill	Bridge Construction	
		0600 Sat - 1800 Sun	Spring Bluff - Rangeview	Re-Railing	
		0730 Sat - 1745 Sat	Spring Bluff - Rangeview	Welding	

SUN 05/07/2015	A	0200 Sat - 0300 Mon (Times TBC) 0030 Sat - 0030 Mon 0600 Sat - 1800 Sun	Corinda - Rosewood Laidley - Forest Hill Spring Bluff - Rangeview	 Bridge Construction Re-Railing	Ipswich Line Shutdown. Westlander stows Toowoomba
SAT 11/07/2015	B				
SUN 12/07/2015	B				
SAT 18/07/2015	C				
SUN 19/07/2015	C				
SAT 25/07/2015	C				
SUN 26/07/2015	C	(Times TBC) 0700 Sun - 1700 Sun	 Corinda - Redbank	Grandchester Steamfest	 No Train Period
SAT 01/08/2015	A	0030 Sat - 0030 Mon 0600 Sat - 1800 Sun 0800 Sat - 1630 Sat	Laidley - Forest Hill Spring Bluff - Rangeview Rangeview - Harlaxton	Bridge Construction Re-Railing Welding	Westlander stows Toowoomba
SUN 02/08/2015	A	0030 Sat - 0030 Mon 0600 Sat - 1800 Sun	Laidley - Forest Hill Spring Bluff - Rangeview	Bridge Construction Re-Railing	Westlander stows Toowoomba
SAT 08/08/2015	B				
SUN 09/08/2015	B				

SAT 15/08/2015	C				
SUN 16/08/2015	C				
MON 17/08/2015	D				
SAT 22/08/2015	D				
SUN 23/08/2015	D				
SAT 29/08/2015	C				
SUN 30/08/2015	C				
MON 31/08/2015	D				
SAT 05/09/2015	D				
SUN 06/09/2015	D				
SAT 12/09/2015	A	0030 Sat - 0030 Mon 0630 Sat - 1730 Sun 0001 Sat - 0310 Mon	Laidley - Forest Hill Holmes - Spring Bluff Dutton Park - Yeerongpilly	Bridge Construction (contingency) Re-Railing 	Westlander stows Toowoomba (if contingency is required) Beenleigh Line Shutdown
SUN 13/09/2015	A	0030 Sat - 0030 Mon 0630 Sat - 1730 Sun 0001 Sat - 0310 Mon	Laidley - Forest Hill Holmes - Spring Bluff Dutton Park - Yeerongpilly	Bridge Construction (contingency) Re-Railing 	Westlander stows Toowoomba (if contingency is required) Beenleigh Line Shutdown

SAT 19/09/2015	B		Roma Street to Toowoomba	Carnival of Flowers - 19th to 26th September 2015	Roma Street to Toowoomba Services running 19th, 20th and 23rd. Toowoomba to Spring Bluff twice daily 20/9 to 26/9
SUN 20/09/2015	B		Roma Street to Toowoomba	Carnival of Flowers - 19th to 26th September 2015	Roma Street to Toowoomba Services running 19th, 20th and 23rd. Toowoomba to Spring Bluff twice daily 20/9 to 26/9
SAT 26/09/2015	C		Roma Street to Toowoomba	Carnival of Flowers - 19th to 26th September 2014	Roma Street to Toowoomba Services running 19th, 20th and 23rd. Toowoomba to Spring Bluff twice daily 20/9 to 26/9
SUN 27/09/2015	C	0700 Sun - 1700 Sun	Corinda - Redbank		No Train Period
SAT 03/10/2015	A	0600 Sat - 1800 Mon	Spring Bluff - Rangeview	Re-Railing	
		0200 Sat - 0230 Tue			Wulkuraka Stable Yard works - Commissioning
SUN 04/10/2015	A	0600 Sat - 1800 Mon	Spring Bluff - Rangeview	Re-Railing	
		0200 Sat - 0230 Tue			Wulkuraka Stable Yard works - Commissioning
MON 5/10/2015	B	LABOUR DAY			
		0600 Sat - 1800 Mon	Spring Bluff - Rangeview	Re-Railing	
		0200 Sat - 0230 Tue			Wulkuraka Stable Yard works - Commissioning
SAT 10/10/2015	B				
SUN 11/10/2015	B				
MON 12/10/2015	D				
SAT 17/10/2015	D				
SUN 18/10/2015	D				
SAT 24/10/2015	C				
SUN 25/10/2015	C				
MON 26/10/2015	D				
SAT 31/10/2015	D				
SUN 01/11/2015	D				
SAT 07/11/2015	C				
SUN 08/11/2015	C				

MON 26/10/2015	D				
SAT 31/10/2015	D				
SUN 01/11/2015	D				
SAT 07/11/2015	C				
SUN 08/11/2015	C				
MON 09/11/2015	D				
SAT 14/11/2015	D				
SUN 15/11/2015	D				
SAT 21/11/2015	A	0600 Sat - 1800 Sun 0010 Sat - 0230 Mon	Spring Bluff - Rangeview Park Road - Lytton Junction	Re-Railing	 Cleveland Line Shutdown. Westlander runs
SUN 22/11/2015	A	0600 Sat - 1800 Sun 0010 Sat - 0230 Mon	Spring Bluff - Rangeview Park Road - Lytton Junction	Re-Railing	 Cleveland Line Shutdown. Westlander runs
SAT 28/11/2015	B				
SUN 29/11/2015	B				
SAT 05/12/2015	C				
SUN 06/12/2015	C	0700 Sun - 1700 Sun	Corinda - Redbank		No Train Period
SAT 12/12/2015	A	0600 Sat - 1800 Sun 0001 Sat - 0310 Mon	Toowoomba Dutton Park - Yeerongpilly	Re-Railing	 Beenleigh Line Shutdown. Westlander runs
SUN 13/12/2015	A	0600 Sat - 1800 Sun 0001 Sat - 0310 Mon	Toowoomba Dutton Park - Yeerongpilly	Re-Railing	 Beenleigh Line Shutdown. Westlander runs
SAT 19/12/2015	B				
SUN 20/12/2015	B				
MON 21/12/2015	D				
SAT 26/12/2015	D				
SUN 27/12/2015	D				

Attachment 3: SCAS Co-ordination Group Minutes February 2015

Meeting Minutes

SCAS COG Meeting

Date: 10 February 2015

Time: 1500 – 1600 hours

Attendees: Matt Green, Steven Adam, Judith Lee, Dean Kelly, Ron Degraaf, Ross Jenkins, Andrew Hanlon, Matt Bradshaw, David Ikin, Mark Paynter, Toni De Prada, Hilda Faumui, Chris Perry.

Apologies: John Powys, Greg Rooney, Therese Miller, Brenden Bryan, Greg Suthers, Glen Doyle, Marco Barazza, Graeme Sang, Steve Ruggeri, David Daniels, Les Schofield, Dean Ledlie.

1.	**18-19 April 2015 Ferny Grove SCAS extended to include the Inner City** Uninterruptible Power Supply (UPS) Fortitude Valley Conversion of eight Signal Heads to LED's Central to Fortitude Valley • **09 December 2014 SCAS COG -** Endorsed pending contingency arrangements. • **13 January 2015 SCAS COG -** Contingency arrangements endorsed. • **27 January 2015 - Special Event request to reschedule complete shutdown due to a special event (ANZAC run).** Proposed reschedule date – 11 to 12 April 2015. Move the Ferny Grove shutdown, including the extended Inner City portion for the Fortitude Valley UPS and extend to include the Roma Street 208 Diamond replacement. Bus operations Corinda, South Brisbane to Albion and Ferny Grove. • Cannot be supported by Network due to Easter 4 day Northcoast Shutdown and the associated Faid constraints. **Proposed options;** • **11 to 12 April 2015.** Ferny Grove SCAS and Fortitude Valley UPS / LED upgrades. (Bus Operations Roma Street to Bowen Hills and Ferny Grove) • **16 to 18 May 2015 Inner City SCAS** – Include (Stage 1) 208 Diamond • **12 to 14 September 2015 Inner City SCAS** – Include (Stage 2) 208 Turnout replacement. The SCAS COG attendees endorsed this proposed option pending GM confirmation. Approval was received and communicated 13 February 2015.
2.	**268 & 269 Turnout Replacement project Fortitude Valley** Monday 09 February 2015, The Project Manager confirmed the Turnout replacement staging requirements to commence in the second half of 2015. • 5 weekend stages required to complete the Turnout Replacements works. Meeting Friday 13 February 2015 to confirm arrangements. CP discussed the staging requirements commencing after Riverfire (September 2015). There was a meeting scheduled for 13.02.2015 with the Project team to discuss their requirements and associated dates. Due to the operational impacts once this project commences which results in the turnouts being out of use, there is a requirement for the 5 stages to be completed as quickly as possible. Below are the proposed dates to be discussed during the March SCAS COG; 1. 17 – 19 October 2015 2. 07 – 09 November 2015 (Current Inner City SCAS) 3. 19 – 21 December 2015 4. 09 – 11 January 2016 5. 13 – 15 February 2016 (Current Inner City SCAS) 6. Contingency date, 19 – 21 March 2016

3.

MBRL Project Update

- **Easter 2015 (4 Days) LPA and Isolation**
  - **Times -** 0200 Fri 03 to 0200 Sun 05 April 2015
  - **Bus Operations –** Northgate to Gympie North
  - **Freight –** No Freight

  - **Times -** 0200 Sun 05 to 2359 Mon 06 April 2015
  - **Bus Operations – Strathpine** to Caboolture
  - **Freight Path**
    - 1600hrs to 2359hrs Sunday 5 April – All Roads open to Freight
    - 0800hrs to 1000hrs Monday 6 April – SLW Down Main Line
    - 1545hrs to 1745hrs Monday 6 April – SLW Down Main Line

- **June 2015 Northcoast SCAS (3 Days)**
  - **Times** – 0200 Sat 06 to 0200hrs Mon 08 June 2015
  - **Bus Operations** – Northgate to Gympie North
  - **Freight** – No Freight

  - **Times** – 0200 to 2359hrs Mon 08 June 2015
  - **Bus Operations** – Strathpine to Caboolture
  - **Freight** – Path TBC

- **August 2015 Northcoast SCAS (2 Days)**
- **October 2015 (3 Days) Details TBC**
- **Christmas 2015 (7 Days) Staged Commissioning**
  - **Times –** 2300hrs Thu 24 to 2300hrs Thu 31 December 2015 TBC due to New Years Eve.
  - **Buses –** Zillmere/Bald Hills to Caboolture TBC
  - **Freight –** Windows TBC
- February 2016 Northcoast SCAS (2 days) Final Commissioning

CP discussed the Easter 2015 4 day shutdown arrangements. Confirmation of future staging required including the Christmas 2015 start and finish times.

4.

01 – 02 August 2015 Gold Coast SCAS. Suns V Westcoast 01 August 2015

11 November 2014 SCAS COG - Special Events tabled a potential conflict with 01 – 03 August 2015 Gold Coast SCAS detailed below;

1. Gold Coast Suns V's Westcoast scheduled for 01 August 2015
2. NRL Draw was not finalised, therefore delaying the proposed alternate weekend

09 December 2014 SCAS COG the following was discussed;

1. Awaiting NRL draw release on 15 December 2014 to confirm game dates

13 January 2015 SCAS COG the following was discussed;

1. NRL draw confirmed Titans playing Friday 24 July 2014
2. It was proposed that the Gold Coast SCAS be rescheduled to 25 – 26 July 2014

Freight representatives rejected this option as it resulted in two West Moreton Coal A weeks for July 2015

Proposed reschedule date – 19 to 20 September 2015

CP proposed the above date. Supply Chain South advised the realignment of the required A week was not possible due to other planned works which align to the current A week (12 – 13 September 2015)
Further discussions required to confirm the following;

- Can the Inner City SCAS be rescheduled to 19 – 20 September 2015
- Can the Gold Coast SCAS be scheduled for the 12 – 13 September 2015

5.	**Western Corridor October 2015.** Wulkuraka (NGR) Commissioning October 2015 will need to align with an A week. 25/26 October Western SCAS will require rescheduling or amalgamation with the Wulkuraka commissioning shutdown 3, 4 & 5 October 2015. Ongoing review of the MBRL and NGR programs to identify if both projects require 3 days to complete works as there is a potential for MBRL to complete works over a 48hr window with another potential up to 24hr window in November. Further communications will take place once information is available. Note: The 24 – 25 October was tabled as an optional date for MBRL however not endorsed by Freight as this would result in up to a 72hrs impact to customers. • Supply Chain South advised that there is an option to reschedule the 20hrs regional shutdown (Monday 26 October 2015) pending MBRL project requirements. • MBRL are currently analysing their program to identify suitable options. Confirmation required for regional shutdowns (Western Tunnel closures) • Supply Chain South advised approximately April 2015 until the Toowoomba Range tunnel project arrangements will be available.
6.	**Roma Street Contact & Catenary Replacement Project** The following options have been proposed for the replacement of the Contact and Catenary wire at Roma Street commencing the second half of 2015 with a completion date of June 2017. During these proposed options, Roma Street will be isolated which will result in extended bus operations (Bowen Hills/Albion to Corinda and South Brisbane) 1. **1 X 4/5 day shutdown – i.e. Easter 2016** 2. **2 X 3 day shutdowns plus multiple partial shutdowns between Roma Street and Milton i.e. Australia Day** 3. **8 X 2 day shutdowns – Alter existing Inner City SCAS limits** 4. **Additional partial shutdowns Main lines or Suburban lines at Roma Street.** Preferred option; 1. Extended 4 day shutdown in conjunction with several 2 day shutdowns 2. 8 X 2 day shutdowns and several partial shutdowns CP discussed the above proposed requirements. Further information will be provided after the Network SCAS workshop to review future SCAS shutdown requirements.
7.	**General Business** 1. Aurizon 60hrs shutdown Callemondah to Rocklands 0500hrs Monday 13 to 1900hrs Thursday 16 July 2015. Potential extended weeknights in SEQ for MBRL. Supply Chain South will confirm arrangements Thursday 12 February 2015. Potential extended week night closures (with bus operations) to be arranged for MBRL. 2. Network SCAS shutdown review. CP discussed the Network review of the current and future SCAS shutdown limits ensuring alignment to future project requirements. Further information will be communicated when available.

Attachment 4: SCAS Calendar Sep-Dec 2014

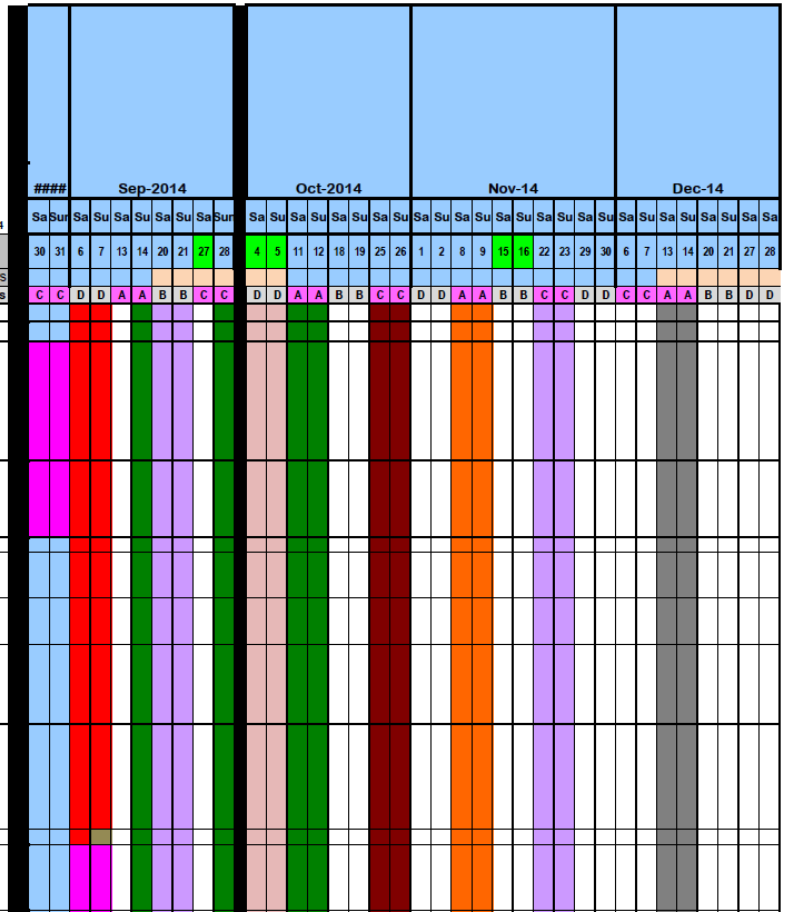
Western Corridor
Gold Coast Line
Inner City Line
Shorncliffe Line
North Coast Line
Cleveland Line
Ferny Grove Line
Closure Requiring Rescheduling
Weeknight Closure (SCAS)
Albion OH Weekend Closure

QueenslandRail

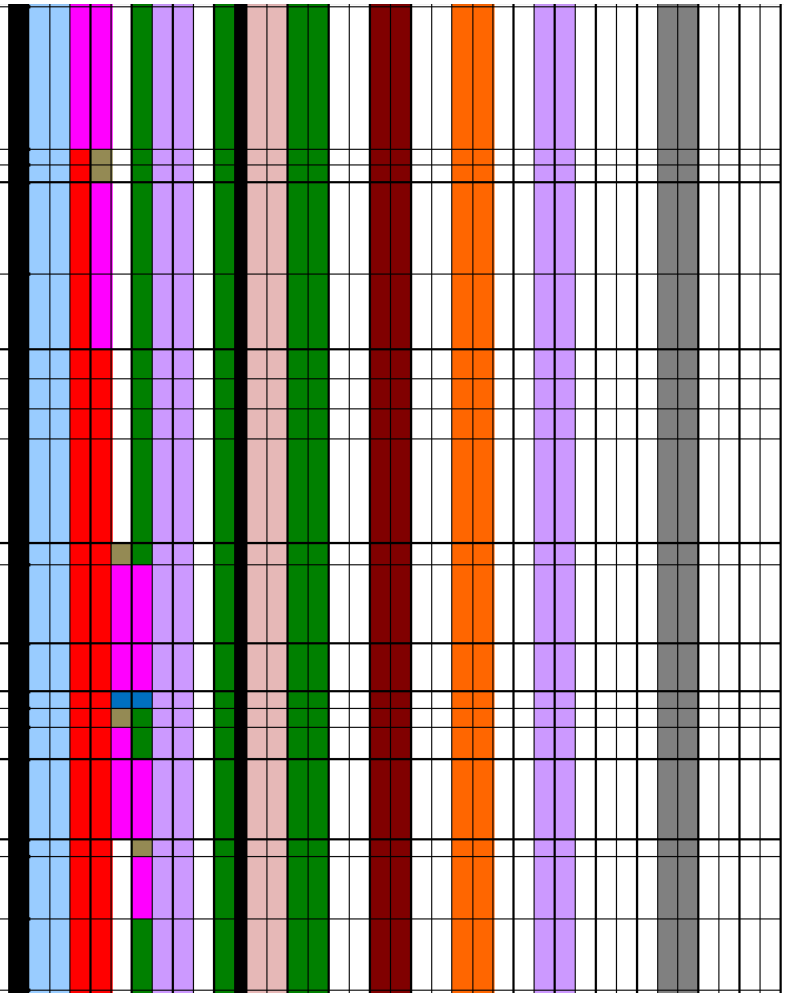
Shutdowns, Closures and Isolations 2014

Updated 28/08/2014

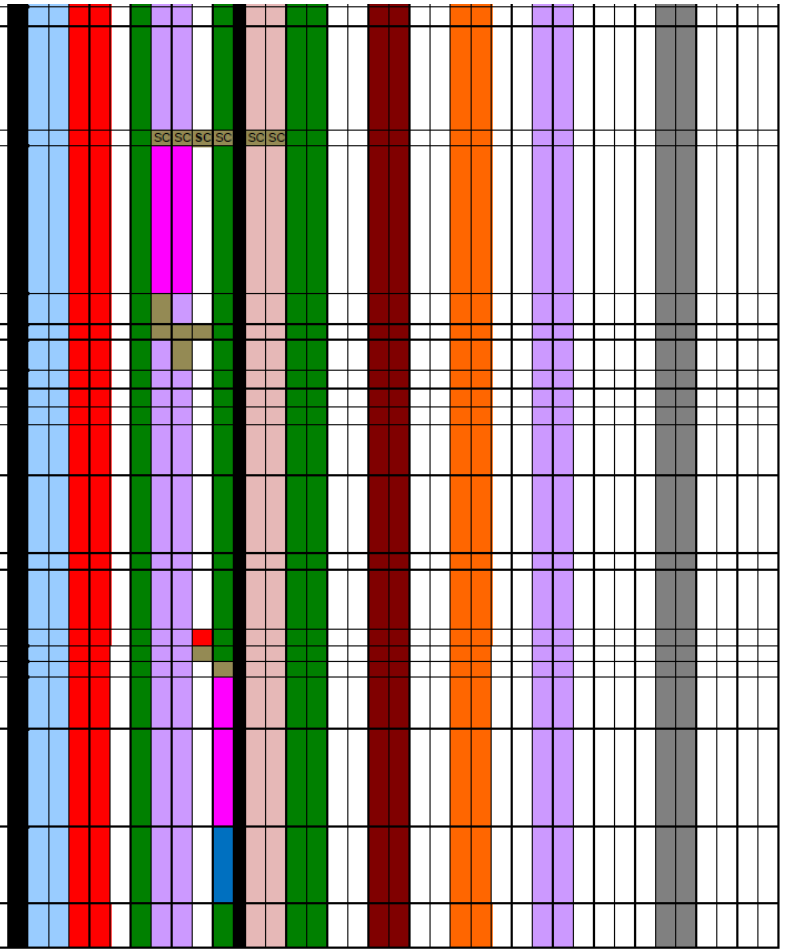
Mth	SCAS	Corridor	Shutdown Details	Start Date	Finish Date	Major Planned Works / Special Events
						School Holidays
						Freight Services
Aug	SE	Special Event		29/08/2014	29/08/2014	NRL - Broncos v St George Dragons -1930hrs Fri - Suncorp Stadium
Aug	SE	Special Event		29/08/2014	29/08/2014	Gold Coast Suns vs West Coast Eagles
Aug	WE	North Coast	**Closure :** Northgate to Caboolture 0200 Sat - 2359 Sun **ISO 1:** 0200 Sat to 2359 Sun **Buses** Northgate to Gympie North	30/08/2014	31/08/2014	Bald Hills VLOM & MEN Inspections: Structures, track, civil and engineering MBRL L2P Works Rerail Petrie & Bald Hills Overhead Maintenance - Burpengary to Caboolture Telegraph Rd Level Xing Recon Down & Middle Rd Mullet Creek Bridge Carseldine Recondition Down & Middle Rd Station Upgrade Maintenance Caboolture
Aug	WE	North Coast	**Closure :** Caboolture to Cooran 0400 Sat - 2200 Sun **TWA 1** Traveston to Tamaree 0400 Sat to 1730 Sun **TWA 2** Traveston to Gympie Nth 1730 to 2200 Sun **ISO 2**: 0400 Sat - 1730 Sun Caboolture to Tamaree **Buses** Northgate to Gympie North / Maryborough	30/08/2014	31/08/2014	Replace Vee 12 Points Gympie North Replace Vee 7 Points Cooroy Bridge Stage Examinations Traveston to Gympie Nth Recondition Ballast Deck Bridge Glanmire
Sep	SE	Special Event		1/09/2014	1/09/2014	Queen + Adam Lambert, Brisbane Entertainment Centre, Boondall
Sep	WN	Ferny Grove Line	**Closure :** Clear of Flyover to Ferny Grove 2200 Mon to 0400 Tues **ISO** 2200 Mon to 0400 Tues **Buses** Bowen Hills to Ferny Grove	1/09/2014	2/09/2014	Mitchelton TSC Replacement Project
Sep	WN	Ferny Grove Line	**Closure :** Clear of Flyover to ferny Grove 2200 Tues to 0400 Wed **ISO** 2200 Tues to 0400 Wed **Buses** Bowen Hills to Ferny Grove	2/09/2014	3/09/2014	Mitchelton TSC Replacement Project 7.460km Defect Removal Dwn Road
Sep	WN	Western Corridor	**Closure** Ipswich to Rosewood 2300 to 0330 Wed & Thurs Up Main **ISO** 2200 to 0330 Wed & Thurs **Buses** Ipswich to Rosewood Freight SLW Down Main	3/09/2014	5/09/2014	DPOH Wulkaraka NGR
Sep	AL OH MTCE	Inner City Line	**Closure :** Roma Street to Bowen Hills 2245 Wed to 0400 Thurs All Roads & Up & Dn Subs Bowen Hills to Albion & Up & Dn Ferny Grove Lines Bowen Hills to Windsor TBC **ISO 1**: 2245 Wed to 0400 Thurs **Buses:** Roma St to Northgate & Ferny Grove **Freight:** via Up & Down Exhibitions then Up & Dn mains Mayne to Albion	3/09/2014	4/09/2014	Comment - Albion Overhead Maintenance to confirm exact isolation section requirements Black Box Maintenance Request for 2100hrs Start on Up Suburban Only
Sep	SE	Special Event		7/09/2014	7/09/2014	NRL - Titans v Cantebery Bulldogs - 1500hrs Sun - Robina Stadium
Sep	WE PROJ	Shorncliffe Line	**Closure:** Northgate to Shorncliffe 0200 Sat to 0200 Mon **ISO:** 0200 Sat to 1400 Sat **Buses** Northgate to Shorncliffe	6/09/2014	8/09/2014	Mechanised Resleepering Resleeper Up Sub Sandgate Platform Replace GIJ SE5 Insert Switch & Stock Rail 770B Points



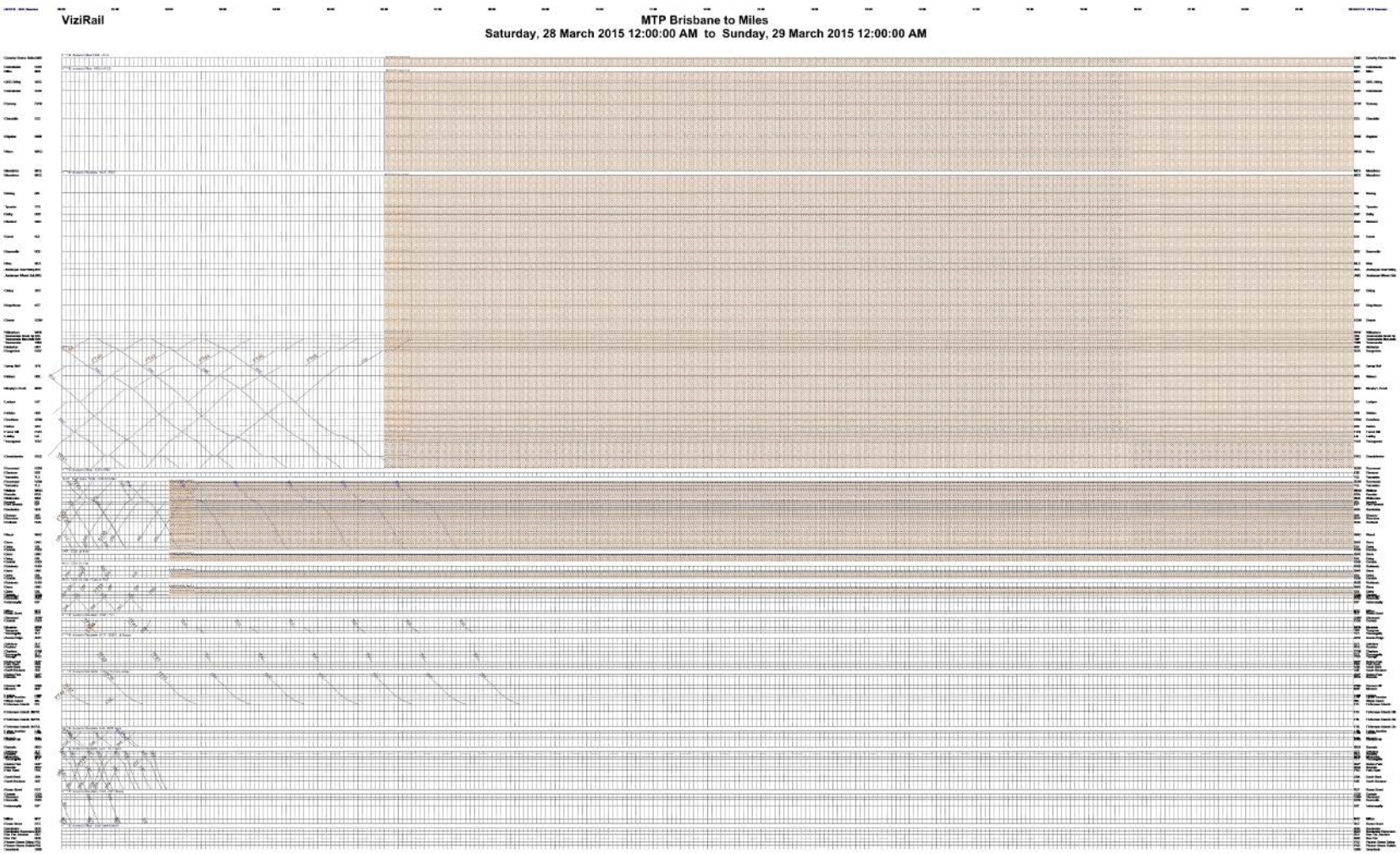
Sep	WE PROJ	Inner City Line	**Closure :** Corinda to Milton Main Lines 0200 Sat to 0200 Mon **ISO** 0200 Sat to 1615 Sun **Buses** Nil **Freight** Via South Brisbane	6/09/2014	8/09/2014	Chelmer Recondition Indooroopilly Bridge Inspection Rerail 9.387km to 9.688km and 8.040km to 7.900km Dn Main Bridge Ends, Chelmer St East Slew Down Main, Chelmer St East Tamper 467 Dwn Main Sherwood Resurface 8.2km to 8.8km Cant adjustment Indooroopilly Bridge to 407 Points Vegetation Control Project Milton
Sep	SE	Special Event		7/09/2014	7/09/2014	Steam Train Sunday Roma St City Loop
Sep	SE	Special Event		7/09/2014	7/09/2014	Bridge to Brisbane 7 Sept
Sep	AL OH MTCE	Inner City Line	**Closure :** Corinda to Bowen Hills & South Brisbane All Roads 2245 Sun to 0400 Mon **ISO 1**: Roma St Neutral Section to Bowen Hills 2245 Sun to 0400 Mon **Buses** Bowen Hills / Albion to Corinda & Park Rd **Freight** - Closure during Natural Freight Window	7/09/2014	8/09/2014	Albion Overhead Maintenace St James College Tunnel Survey Adzing Timbers 228A/B Roma St
Sep	WN	Western Corridor	**Closure** Ipswich to Rosewood 2200 to 0330 Mon, Tues, Wed, Thurs Up Main **ISO** 2200 to 0330 **Buses** Ipswich to Rosewood **Freight** SLW Down Main	8/09/2014	12/09/2014	Mechanised Resleepering DPOH - Wulkaraka NGR
Sep	GOA	Inner City Line	Central	9/09/2014	10/09/2014	**GOA Alliance:** Platform 1: 2230 to 0430 Closure & Isolation Platform 6: 0030 to 0430 Closure & Isolation
Sep	WN	Gold Coast/Beenleigh Line	**Closure :** Kuraby to Beenleigh Last Train to First Train Up & Down Mains ~~**Buses** Kuraby to Beenleigh~~	9/09/2014	10/09/2014	Box up Turnouts Kingston to Kuraby
Sep	WN	Gold Coast/Beenleigh Line	**Closure :** Kuraby to Beenleigh Last Train to First Train Up & Down Mains ~~**Buses** Kuraby to Beenleigh~~	10/09/2014	11/09/2014	Box up Turnouts Kingston to Kuraby
Sep	AL OH MTCE	Inner City Line	**Closure :** Roma Street to Bowen Hills 2245 Wed to 0400 Thurs All Roads & Up & Dn Subs Bowen Hills to Albion & Up & Dn Ferny Grove Lines Bowen Hills to Windsor TBC **ISO 1**: 2245 Wed to 0400 Thurs **Buses:** Park Rd & Milton to Albion & Ferny Grove **Freight:** via Up & Down Exhibitions then Up & Dn mains Mayne to Albion	10/09/2014	11/09/2014	Albion Overhead Maintenace Retimber 251 Points DS Central Graffiti Removal Fortitude Valley LED Upgrade Fortitude Valley Structure Repairs Fortitude Valley
Sep	SE	Special Event		13/09/2014	13/09/2014	Wallabies vs Argentina Robina Stadium
Sep	WE PROJ	Fisherman Islands	**Closure** Fisherman Islands **#1** - 0600 Fri to 0600 Tues (No Western Coal 96 hrs) Provisioning Rd Clear of Dual Gauge **#2** - 1900 Sat to 1800 Mon (Freight Free after Sea Freighters) All Roads Clear FS62	12/09/2014	16/09/2014	Rerail Coal Unloader Re-lay provisioning Road Replace Switch & Stock Rail 133 Points Replace Vee & Timbers 126 Points Rerail DG Through Boat Ramp Rd
Sep	WE PROJ	Western Corridor	**Closure** Corinda to Wacol All Roads 2200 Sat to 0400 Sun **Buses** Corinda to Redbank & Springfield	13/09/2014	14/09/2014	Darra UPS Upgrade Works (Stage 1 - Installation) Signal Outage
Sep	SE	Special Event		13/09/2014	14/09/2014	Broncos NRL Final TBC
Sep	SE	Special Event		13/09/2014	13/09/2014	Flower Show Steam Train - Ipswich to Laidley & Grandchester Return
Sep	AL OH MTCE	Mayne Yard	**Closure :** Mayne Yard 1000 to 1600 Sat **ISO 1**: 1000 to 1600 Sat	13/09/2014	13/09/2014	Albion Overhead Maintenance
Sep	AL OH MTCE	Inner City Line	**Closure :** Bowen Hills to Northgate 2245 Sat to 0400 Sun **ISO 1:** 2245 Sat to 0400 Sun **Buses**: Bowen Hills to Northgate **Freight**: Closure during Natural Freight Window	13/09/2014	14/09/2014	Albion Overhead Maintenance All Roads Albion to Bowen Hills Tree Removal on Suburbans TBC 706C/D/E US Eagle Junction Turnout Maintenance 700C/D/E UM Eagle Junction Turnout Maintenance 701C/D/E DS Eagle Junction Turnout Maintenance
Sep	SE	Special Event		14/09/2014	14/09/2014	Andrea Bocelli Concert - Boondall Entertainment Centre
Sep	WE	Western Corridor	**Closure** Ipswich to Rosewood 0200 Sun to 0300 Mon TBC **ISO** 0200 to 1700 Sun **Buses** Ipswich to Rosewood **Freight** Nil	14/09/2014	14/09/2014	DPOH Wulkaraka NGR Mechanised Resleepering Walloon Replace Vee 8A Points Yarrowlea Retimber 8A, 8B & 7 Points Yarrawlea
Sep	AL OH MTCE	Inner City Line	**Closure :** Bowen Hills to Northgate all roads 2245 Sun to 0400 Mon **ISO 1**: 2245 Sun to 0400 Mon **Buses:** Bowen Hills to Northgate **Freight** - Closure during Natural Freight Window	14/09/2014	15/09/2014	Albion Overhead Maintenance All Roads Albion to Bowen Hills 706C/D/E US Eagle Junction Turnout Maintenance 700C/D/E UM Eagle Junction Turnout Maintenance 701C/D/E DS Eagle Junction Turnout Maintenance



Sep	SE	Special Event		15/09/2014	15/09/2014	Kanye West Concert - Boondall Entertainment Centre
Sep	AL OH MTCE	Inner City Line	**Closure :** Roma Street to Bowen Hills 2245 Wed to 0400 Thurs All Roads & Up & Dn Subs Bowen Hills to Albion & Up & Dn Ferny Grove Lines Bowen Hills to Windsor TBC **ISO 1**: 2245 Wed to 0400 Thurs **Buses:** Roma St to Eagle Junction & Ferny Grove **Freight:** via Up & Down Exhibitions then Up & Dn mains Mayne to Albion	17/09/2014	18/09/2014	Albion Overhead Maintenance Graffiti Removal Fortitude Valley GU replacement 2.396km Defective Rail 2.320km Structure Repairs Fortitude Valley
Sep	SC	School Holidays		20/09/2014	6/10/2014	School Holidays 20 Sept - 6 Oct
Sep	WE	Inner City Line	**Closure :** Roma Street to Corinda, Murarrie and Yeerongpilly 0200 Sat to 0300 Mon. All roads, except Down Main Roma Street to Sherwood & Dual Gauge Yeerongpilly to Murarrie for freight SLW. **ISO 1**: 0200 Sat to 0300 Mon. All Roads. **Buses** Roma Street to Corinda, Murarrie and Yeerongpilly **Freight** Wheels free windows at Roma Street to Sherwood DM 0200 to 0500 Sat. 0100 to 0300 Sun 0900hrs to 1900hrs Sun and 0100 to 0300 Mon Yeerongpilly to Dutton Park Dual Gauge 0800hrs to 1600hrs Sun, XPT Cancelled	20/09/2014	22/09/2014	207A/B Signals Commissioning Rerail Roma Street to Corinda 16 rails Overhead Maintenance - Roma Street Feeder Station Inspections: Structures, track, civil and engineering Rerail Countess St Up & Down Subs 648 Turnout Replacement Geotech investigations Replace timber bearers 222 & 214 Roma St Vegetation Control Project Down Main & Up Sub Roma St Rerail 0.300km to 0.500km Park Rd to Buranda Milton Station Mast Relocation US
Sep	SE	Special Event		20/09/2014	20/09/2014	Steam Train - Roma St to Towwoomba Return (Carnival of Flowers Service)
Sep	SE	Special Event		20/09/2014	27/09/2014	Toowoomba Carnivale of Flowers 20-27 Sept
Sep	SE	Special Event		21/09/2014	21/09/2014	Steam Train - Roma St to Towwoomba Return (Carnival of Flowers Service)
Sep	SE	Special Event		22/09/2014	23/09/2014	Robbie Williams Concert - Brisbane Entertainement Centre - Bondall
Sep	SE	Special Event		23/09/2014	23/09/2014	Robbie Williams Concert - Brisbane Entertainement Centre - Bondall
Sep	SE	Special Event		23/09/2014	23/09/2014	Steam & Rail Motor Roma St to Ipswick Workshops
Sep	WN	Cleveland Line	**Closure :** Buranda to Murarrie 2010 Tue to 0450 Wed Up & Down Suburban Lines **Buses** Park Road to Murarrie **Freight** Via Dual Gauge	23/09/2014	24/09/2014	696pts switch & stock Cannon Hill Soil Testing Crown St (Guard & Splay Rail Project)
Sep	WN	Cleveland Line	**Closure :** Buranda to Murarrie 2010 Wed to 0450 Thur Up & Down Suburban Lines **Buses** Park Road to Murarrie **Freight** Via Dual Gauge	24/09/2014	25/09/2014	693pts vee Stick Welding Cannon Hill Replace Bull Horns Buranda to Coorparoo Lift & Pack Bridge Ends with Hi Rail Excavator Coorparoo to Morningside Soil Testing Crown St (Guard & Splay Rail Project)
Sep	SE	Special Event		24/09/2014	24/09/2014	Railmotor - Roma St to Towwoomba Return (Carnival of Flowers)
Sep	AL OH MTCE	Inner City Line	**Closure :** Roma Street to Bowen Hills Up & Down Mains 2220 Wed to 0400 Thurs **ISO** Up & Down Mains 2200 Wed to 0400 Thurs **Freight:** Via Exibition	24/09/2014	25/09/2014	Albion Overhead Maintenance
Sep	SE	Special Event		27/09/2014	27/09/2014	Riverfire
Sep	SE	Special Event		26/09/2014	27/09/2014	Justin Timberlake at Boondall (Fri & Sat night)
Sep	SE	Special Event		28/09/2014	28/09/2014	QRL Intrust Supercup Grand Final - Suncorp Stadium 1555hrs
Sep	WE PROJ	Inner City Line	**Closure** Milton to Indooroopilly Up & Down Suburban Lines 0600 to 1630 Sun TBC **Freight** Via Main Lines	28/09/2014	28/09/2014	Replace Defective Rails - 2.918km, 3.335km, 4.650km, 4.941km
Sep	AL OH MTCE	Inner City Line	**Closure :** Corinda to Bowen Hills & South Brisbane All Roads 2245 Sun to 0400 Mon **ISO 1**: Roma St Neutral Section to Bowen Hills 2245 Sun to 0400 Mon **Buses** Bowen Hills / Albion to Corinda & Park Rd TBC **Freight** - Closure during Natural Freight Window	28/09/2014	29/09/2014	Albion Overhead Maintenance - Roma Street Feeder Station
Sep	WN	Western Corridor	**Closure** Ipswich to Rosewood 0700 to 1700 Sun Up & Down Main TBC **ISO** 0700 to 1700 Sun **Buses** Ipswich to Rosewood TBC **Freight** Nil	28/09/2014	28/09/2014	DPOH Wulkaraka NGR - contingency for the 13/09 Cross hatching level crossing TBC Stress Testing Loc TBC
Sep	WN	Inner City Line	**Closure :** Roma Street to Bowen Hills Up & Down Suburban Lines 2220 Mon to 0400 Tues **Buses** Roma Street to Bowen Hills / Albion.	29/09/2014	30/09/2014	Defective Rail repair 1.095km Up Suburban

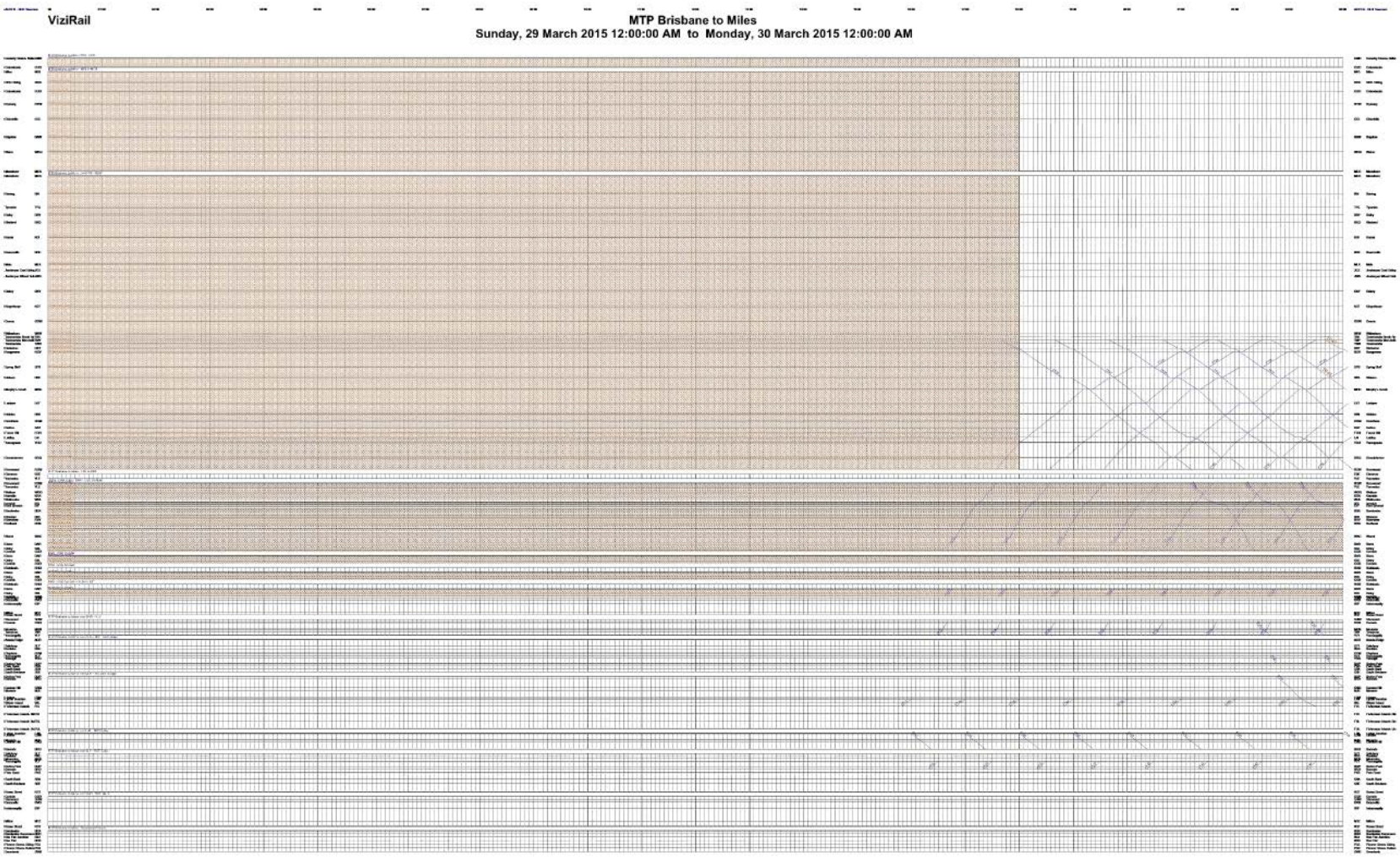


Attachment 5: Impact of 48 vs 36 hour maintenance closure



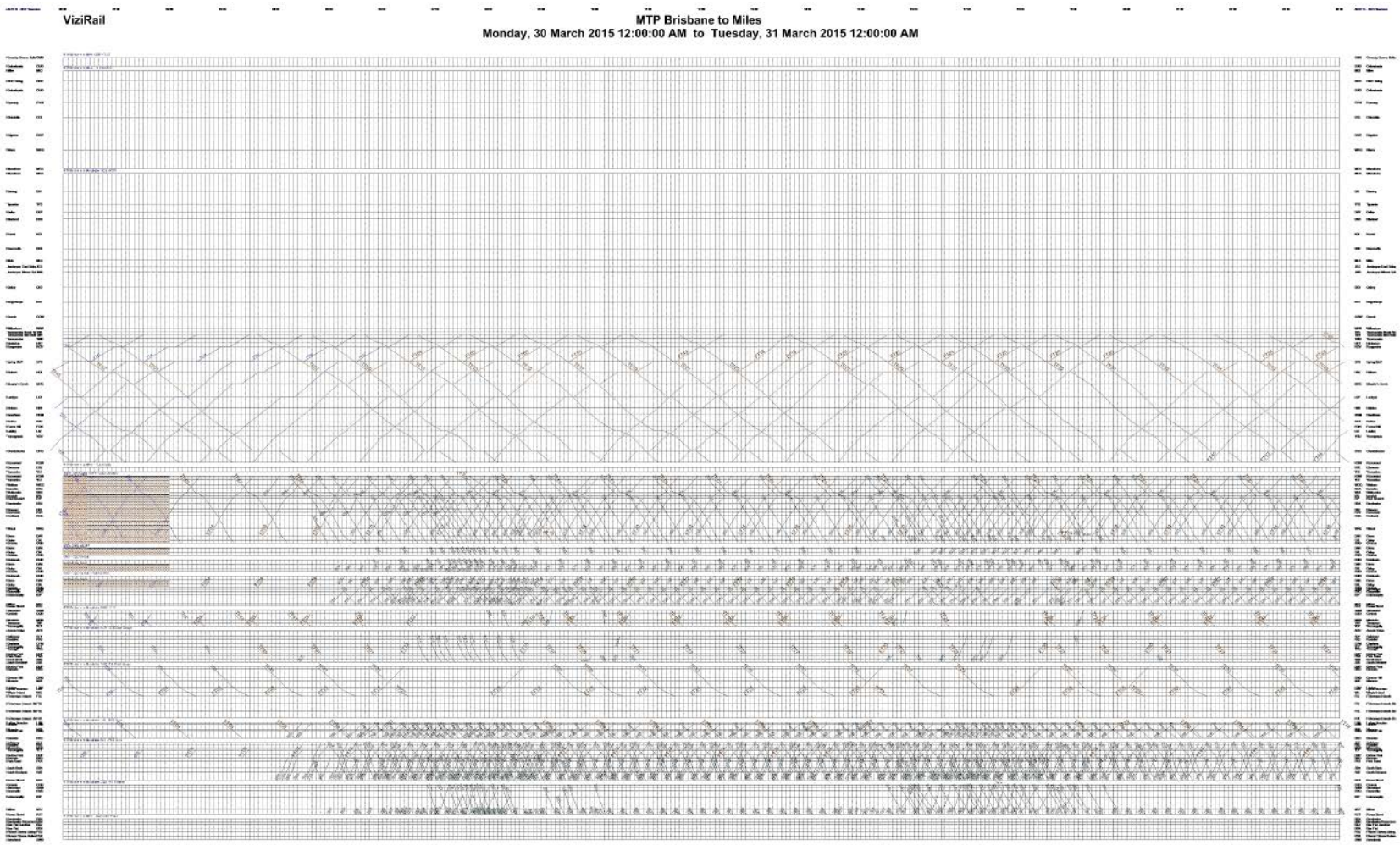
Saturday Capacity with and without Metro 48 hour closure

Blue paths are only for the 36 hour closure



Sunday Capacity with and without Metro 48 hour closure

Blue paths are only for the 36 hour closure



Monday Capacity with and without Metro 48 hour closure

Blue paths are only for the 36 hour closure

Appendix 6 –West Moreton System Asset Management Plan

West Moreton System

Asset Management Plan 2015/16

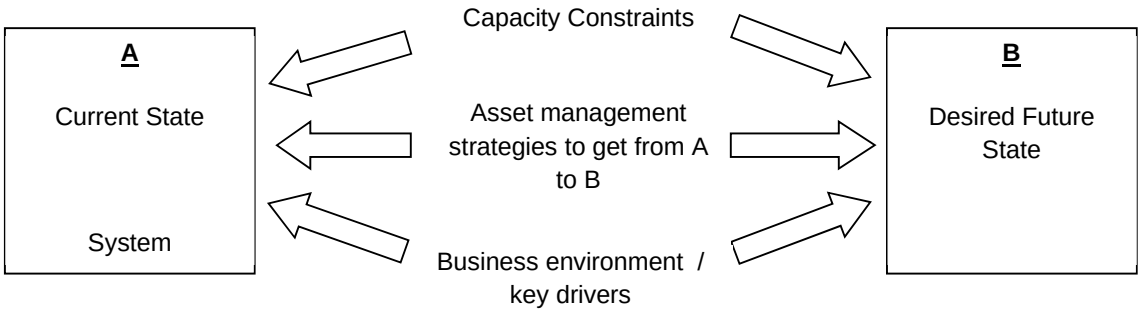
Table of Contents

1. Introduction

The West Moreton System Asset Management Plan is a rolling 10-year plan for managing Queensland Rail's West Moreton network infrastructure on a whole-of-lifecycle basis. Although influenced by a variety of factors, the general objective of the plan is to meet the required level of service for the West Moreton rail system in the most cost-effective manner through the prudent management of assets for Queensland Rail's present and future customers. The West Moreton Asset Management Plan (AMP) is based on internationally recognised asset management principles, is guided by the Queensland government's rail transport policies and strategies, and aims to be responsive to the needs of Queensland Rail's customers.

This AMP addresses the West Moreton network infrastructure assets managed by Queensland Rail's Network business; it does not include rollingstock and related assets, plant and equipment or corporate assets such as property, information technology systems and road fleet.

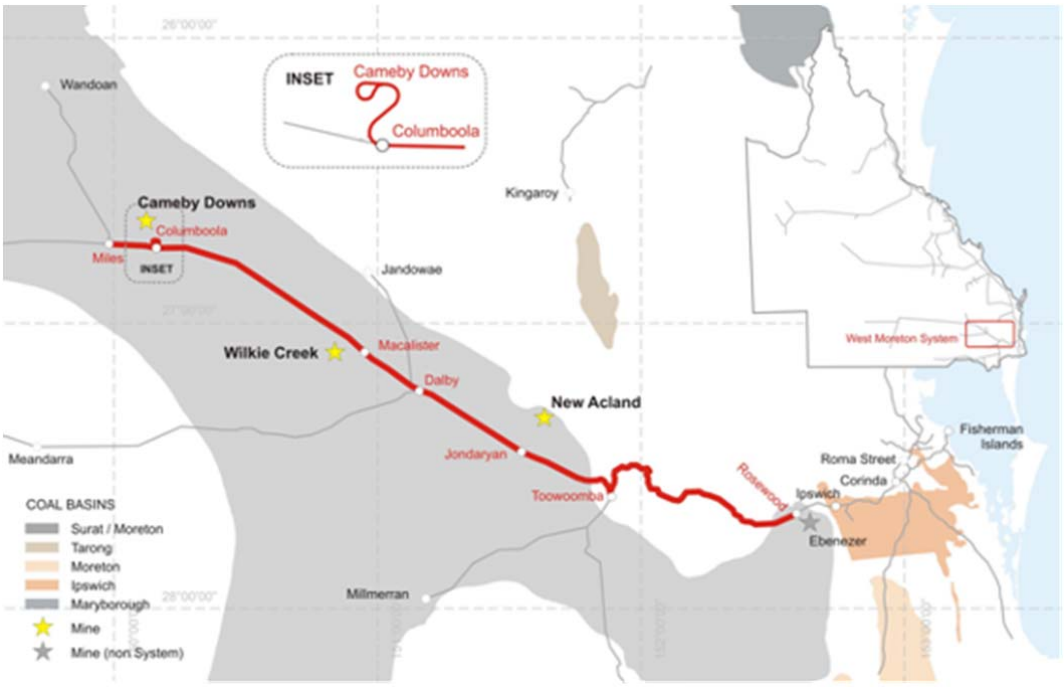
The structure of the West Moreton AMP is illustrated below. The AMP describes the current state of the network; the capacity constraints and business drivers that are impacting and shaping the network; the resulting desired state for the network; and the various strategies that will take it from the current state to the desired future state.



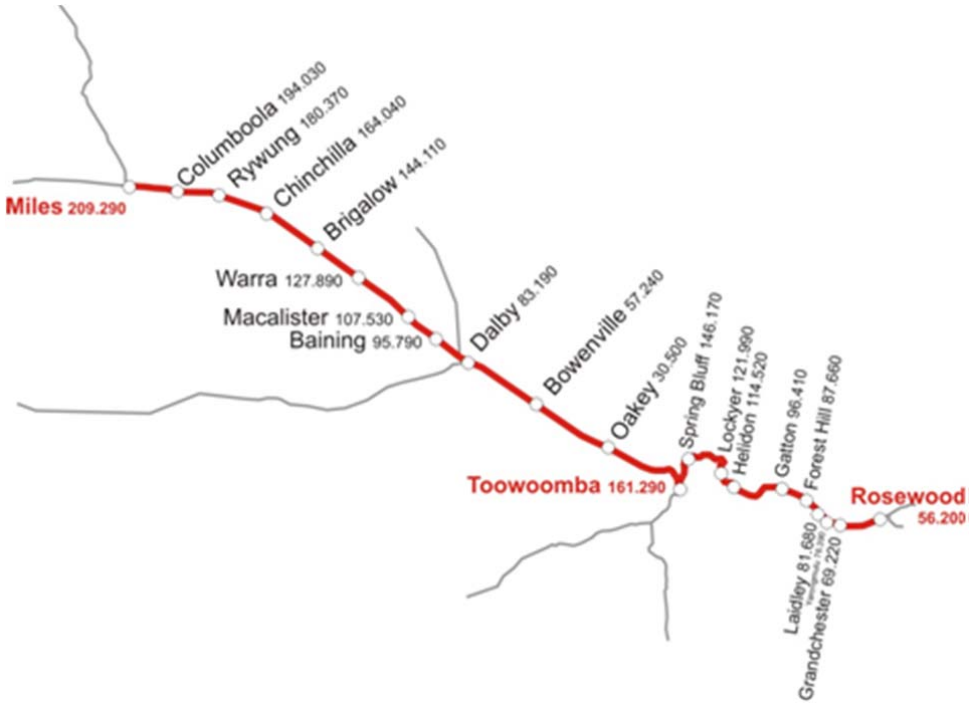
2. System Description

2.1 Overview of System Characteristics and Current Infrastructure

Route Length:	330 km narrow gauge
Track Length:	435 km narrow gauge
Rail Size:	41, 50, 60 kg/m
Main Line Sleepers:	Concrete, interspersed steel and timber sleeper: predominantly 1 in 2
Maximum axle load:	15.75 tonne axle load (tal)
Max Operating Speed	80 km/h
Signalling:	RCS and DTC
Maximum train length:	670m



The West Moreton System is an important link in the supply chains that exports coal and agricultural products from areas of south-west Queensland through the Port of Brisbane. The system begins on the western side of Rosewood on the Main Line and runs through Toowoomba to Miles on the Western Line. This section is the predominant coal corridor for the system. The West Moreton System does not include the Glenmorgan Line which runs from Dalby and now stops at Meandarra, the Southern Line from Toowoomba to Wyreema or the Ebenezer Line.



2.2 Current Traffic Types, Operators and Key Customers

System Tonnage 2013/14: 7.263 million net tonnes

Predominant Traffic: Coal, grain, cotton, passengers

Current Operators: Queensland Rail & Aurizon

Key Customers:

The West Moreton System is a multi-use system with coal, freight and passenger utilising paths. Coal dominates traffic from west of Toowoomba and is the predominant driver for the asset strategies for the system. Trains are limited to 15.75tal with a train length of 670m.

Aurizon is the sole freight service operator and has rollingstock that is specific for the West Moreton System. The requirement for specific rollingstock is a potential barrier to entry for another operator. Queensland Rail is the passenger service operator running the Westlander from Brisbane to Charleville. Patronage on this service is in decline and options for continuing this service are currently being investigated.

Traffic from the South West System joins West Moreton at Toowoomba. The South West System carries seasonal agricultural traffic with Aurizon as the freight service operator.

3. Business Environment / Key Drivers

3.1 Commercial Environment / System Viability

The West Moreton System generates significant revenue via access charges as a result of the large amount of coal which it carries. Revenue is also received from the Transport Service Contract between Queensland Rail and the Department of Transport and Main Roads (DTMR). The TSC is renewed on an annual basis.

The commercial revenue generated by the West Moreton System is based on a reference tariff that is approved by the Queensland Competition Authority (QCA). The tariff is the cost per gross tonne kilometre (GTK) charged for accessing the West Moreton System on one of the 77 allocated coal paths each week that enables the transport coal to the Port of Brisbane. “Take or Pay” arrangements exist to ensure certainty for Queensland Rail over commercial revenue.

Queensland Rail’s proposed tariff was included in the Access Undertaking 1 (AU1) submission to the QCA in May 2015. This tariff, once approved, will replace the temporary tariff that has been in place since 2010. The period the tariff will cover is from 1 July 2015 to 30 June 2020.

The tariff is partly based on an assumed capital expenditure program to be undertaken during the AU1 regulatory period. The program proposed by Queensland Rail includes both capital and operational projects. Some of the projects included under the tariff profile are fully funded by access revenue while others will be supplemented by the TSC.

Other non-coal traffic (agricultural products) is a small portion of the total traffic task. Agricultural products and other freight trains are allocated 14 paths through Rosewood to Macalister per week. This traffic is funded under the TSC which is calculated as the difference between:

1. An approved revenue allowance for Queensland Rail, including:
    a. A return on the book value of the assets, at a WACC rate set by DTMR and Treasury;
    b. Estimated efficient operating and maintenance costs for providing services at a level agreed with DTMR; and
2. The actual revenue including coal and non-coal tariffs.

Therefore any decrease in tariff will cause an increase in the TSC funding requirement.

3.2 Government Policy and Strategy

DTMR's Rail Network Strategy is a critical document in terms of outlining the government's vision for Queensland Rail's network. This strategy, which is currently under development, will influence Queensland Rail's asset planning in coming years and will outline the key investments required to achieve the strategic outcomes sought by government. An endorsed rail strategy from DTMR will provide Queensland Rail visibility of future service levels and operating paradigms, and strengthen the organisation's ability to adequately plan for the future.

The Moving Freight Strategy is another key component of DTMR's strategic framework. The strategy confirms that rail is government's preferred mode of freight transport and prioritises the expansion of the use of rail freight. The document acknowledges that opportunities exist to attract freight volumes to rail for agricultural and general freight tasks via alternative train operating models, enhancing contestability and promoting the use of under-utilised infrastructure. Additionally, the Department of Agriculture, Fisheries and Forestry's Agriculture Strategy, which aims to double the value of Queensland's food production by 2040, recognizes the importance of improved freight access and development of options to support the sector's growth.

3.3 Operator Requirements

The major business for the system is the transportation of coal from the Surat Basin. The West Moreton System has come into being with the emergence of coal as the major traffic task on that system with the establishment of the Macalister Coal mine some 15 years ago, the New Hope Jondaryan operation five years later and the recent commissioning of the Yancoal Columboola mine. Coal prices on the world market took a significant hit during 2013/2014 which has led to the closure of the Macalister Mine. Prior to this coal emergence traffic consisted of cattle, grain and mixed freight with a nominal long distance passenger service.

Down-stream gross tonnage on the Rosewood to Helidon section has increased from 4.7mgta in 1989/90 to present tonnages of approximately 13mgta. Without additional capacity upgrade projects, this plan assumes tonnages will stay reasonably static in the short term. Typical coal trains are double header 96t locos with forty-one 63t wagons at nominal 15.75 tonne axle loads.

To ensure the supply chain delivers the product to the Port of Brisbane on time, the above rail operator's services are timetabled to meet the requirements of the busy SEQ network. Delays in these services result in trains waiting for a new time slot in the SEQ network and delaying delivery of the end customer's product to port.

Queensland Rail has a contractual obligation with Aurizon as the above rail operator to minimise below rail transit time. However, an operator such as Aurizon will also seek:

- a known cap on the number, location and time interval between track possessions
- best possible response times to any network disruption (including force majeure events)
- some spare capacity for peak production rates, or catch up capacity
- coordinated supply chain shutdowns and track possessions

Queensland Rail aims to meet these operator / supply chain requirements by limiting the number of speed restrictions and the total number of unavailable days for train traffic. However, these can also be impacted by factors that are not within the control of Queensland Rail.

3.4 Investment Drivers and Triggers

Inland Rail

The Federal Government through ARTC is investigating building an inland freight rail line from Melbourne to Brisbane. The intention of this project is to allow freight to be transported from all regions near the line to its destination more quickly and economically.

This line will be standard gauge rated at 26tal and built using part of existing track and formation. Once into Queensland it is possible it may become dual gauge through to Acacia Ridge.

The plan has a new range crossing for the Toowoomba range with two options, one using part of the existing alignment on the eastern side of the range, the other utilising a more direct alignment into the Lockyer Valley. The plan is to only build the line to Acacia Ridge and not to the Port of Brisbane.

A scenario under consideration is to replace the existing line from Toowoomba to Miles with 26tal standard gauge and link this into the inland rail at Toowoomba. This would enable increased tonnage from the Surat Basin coal mines.

If the inland rail line is constructed ARTC would become the owner / manager / maintainer of the full system from Melbourne to Brisbane. Until clarity exists regarding Inland Rail and its final scope it will not be considered further in this asset management plan.

Strategic Investment by State Government

Queensland Rail's market share of the agricultural freight task in regional Queensland has declined significantly over the last 10 years. This has placed increased pressure on the regional road network whilst the regional rail lines continue to be significantly under-utilised (with the exception of the West Moreton Coal Corridor - Miles to the Port of Brisbane). This reduction in rail freight volumes has also resulted in a significant increase in truck movements through Brisbane to the Port of Brisbane.

The previous state government announced a $58.75m project to complete capacity upgrades and tunnel clearance works on the Toowoomba and Little Liverpool Ranges in May 2013 as part of a plan to implement a rail freight growth strategy. This project is currently under review by the new state government. If the project proceeds it would be expected that Queensland Rail will manage the project and work will be delivered under a single Design and Construction (D&C) contract.

SEQ 2032 Limitation

Glencore Xstrata has shelved plans for the Wandoan Coal Mine project. As a result the Southern Missing Link will not be constructed. Therefore any coal traffic from the Surat Basin must continue to traverse the West Moreton System through to the Port of Brisbane. The Queensland Government has stipulated that coal trains will not continue through the SEQ network beyond 2032. An alternative route or a renegotiation of this timeframe will need to occur to accommodate any growth in coal tonnages past this date on the West Moreton System. Discussions with stakeholders in the West Moreton supply chain are progressing to determine a way forward through this limitation.

3.5 Traffic Potential

Traffic is limited by the capacity of the Toowoomba range with a total of 112 return paths per week. Of these, 77 are allocated for coal, 14 for freight and 2 for passenger. The remaining 19 allocated paths are available as spare capacity. The current lengths of passing loops are limiting the lengths of trains through the system to 670m. Traffic from the West Moreton System must arrive at the entry to the SEQ network at the timetabled time to ensure its path through the network to the Port of Brisbane. Any growth potential on the West Moreton System must consider the SEQ network for paths and train length.

Coal Growth

Coal has 87 contracted paths through the SEQ network each week. Any growth in tonnages must take advantage of these existing paths as there are no new paths available.

Queensland Rail is assisting [redacted] in its investigations to increase tonnage from [redacted] mtpa to [redacted] mtpa from the [redacted] mine within [redacted] years (additional capital and maintenance costs have not been considered in this document). New generation rollingstock that reduces the space between wagons and increases the load capacity of the wagon without increasing the axle load are being considered.

The Queensland Government currently has imposed a date limit for coal traffic traversing through the SEQ network of 2032 which if not increased will potentially restrict future growth if coal companies do not have a viable way of access a coal export port.

Freight

Aurizon, as the only freight operator on the West Moreton and South West Systems, do not consider agricultural products as core business. Divestment of this business by Aurizon may occur which would reduce tonnage and create modal shift back to road. Strategic initiatives are in place and discussions have been held aimed at attracting new operators to this market.

Passenger

The Westlander currently travels twice a week from Brisbane to Charleville and return. The future of this service is under review due to declining patronage. Retiring the current rollingstock assets in favour of a Diesel Multiple Unit style service is one option that is being considered.

3.6 Capacity Constraints

The West Moreton System is constrained by five aspects.

- All timber and steel structures are limited to 15.75tal;
- Most of the formation material was not engineered and is considered under-strength for 15.75tal;
- The Toowoomba Range restricts train path capacity to 112 return paths;
- Passing loops on the Toowoomba Range are 670m long, which dictates the maximum length of trains on the system; and
- Available paths in the SEQ network for trains to reach the Port of Brisbane.

The steep grades of the Toowoomba Range and the Little Liverpool Range cause trains to traverse these sections slowly, which combined with single line workings in both locations causes capacity constraints.

The Toowoomba Range is subject to landslides in extraordinary rain events (>Q100 levels) with major reconstruction repairs to the track required in recent years. Geotechnical monitoring and assessments are currently underway which has shown that further investment is required to reduce the risk of further landslides. This will provide certainty to our supply chain partners that service disruptions will be minimised.

4. Asset Descriptions and Strategies

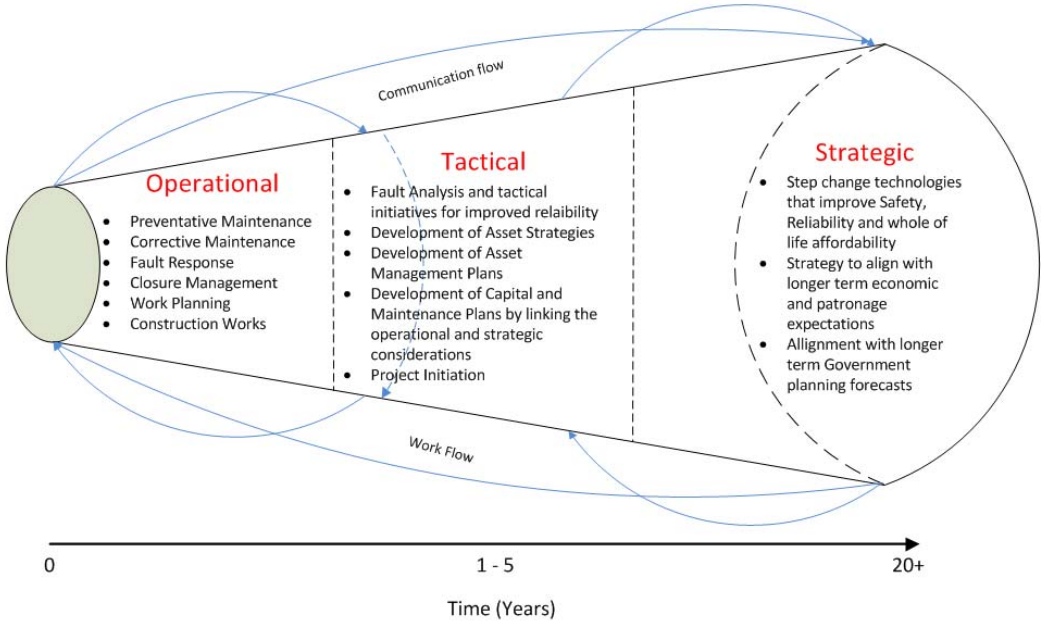
4.1 Strategic Framework

The vision for the West Moreton System is to provide a safe and reliable network that is trusted by customers, where performance is competitive with industry and represents sound value for money for Queensland Rail's stakeholders.

Some of the key strategies that are currently being implemented or in the process of being introduced by Queensland Rail are as follows:

- Predictive not reactive maintenance – to be achieved through better collection, analysis and utilisation of asset condition data so that faults can be prevented instead of repaired;
- Undertake asset renewals that introduce modern, reliable, low maintenance, less disparate and (where possible) future-proof infrastructure assets;
- More effective planning of works delivery with the aim of minimising the impacts of capital works and major maintenance on network availability and delivering improved productivity outcomes from closures;
- Focus on improved cost-effectiveness by reviewing internal works processes and cost contributors and more effective utilisation of industry through appropriate packaging and tendering of works and management of delivery.

Queensland Rail's approach to asset management includes strategic, tactical and operational components. The capital program outlined in section 6 contains many of the strategic and tactical initiatives discussed below, whilst the maintenance program in section 7 reflects the operational component of the West Moreton Asset Management Plan.



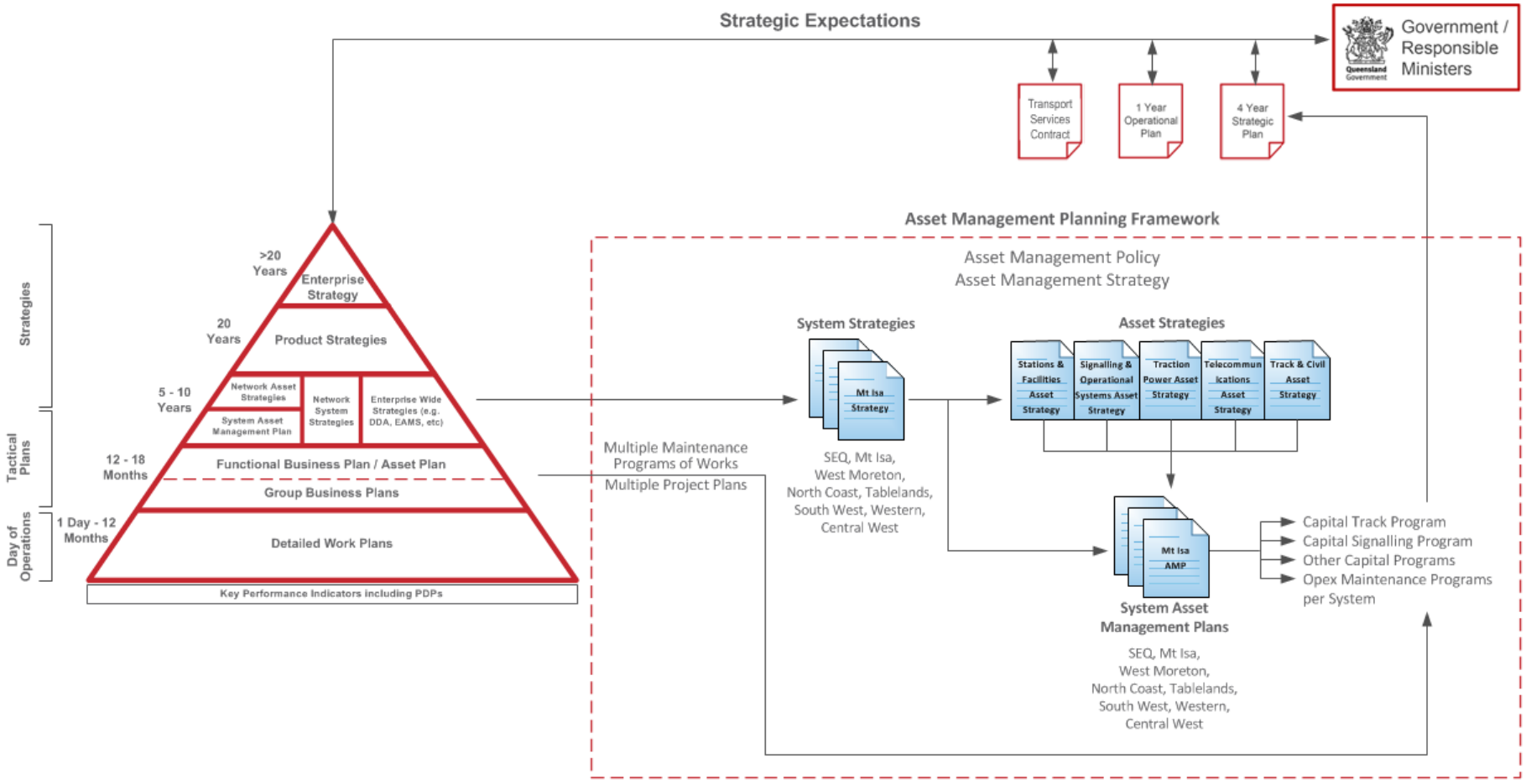
4.2 Strategic Assumptions

The following table provides a snapshot of the strategic assumptions for the Asset Management Plan.

Short Term 1-5 years	Medium Term <10 years	Long Term >10 years
• 11 million gross tonnes maximum per year for 2 years • Alternative freight provider/s are being investigated • Additional agricultural volumes considered probable • Longer train trials	• [redacted] • Stage 1 Inland Rail (Southern Freight Bypass) • Asset renewals / upgrades to support growth	• SEQ 2032 access limitation • Inland Rail • Tonnage profile reaching 15 mtpa (net)

Queensland Rail's Strategy / Planning Hierarchy

Our approach to making performance count



4.3 Track and Civil Assets

Asset Description

The West Moreton System is approximately 435 kilometres of mainline and loop track between Rosewood and Miles.

From an asset management perspective, the system can be divided into three sections where the asset is configured differently due to topography, soil types and traffic. These sections are:

- Rosewood to Toowoomba;
- Toowoomba to Jondaryan; and
- Jondaryan to Miles.

The majority of the formation from Rosewood to Miles dates back to the original line construction between 1865 and 1880. The majority of the West Moreton formation material is black soil. Sections of the system from Rosewood to Toowoomba are low-lying rock/sandstone which allows good foundations to be built. Across the system there is approximately 15-20km of engineered formation.

Standard carbon rail is used throughout the West Moreton coal system except where there are tight radius curves, for example the Toowoomba Range.

Rosewood to Toowoomba

This section, identified as the Main Line, is duplicated between Rosewood and Helidon with only Grandchester to Yarongmulu over the Little Liverpool Range being single track. The down road section is predominantly 50kg rail with concrete sleepers as it carries the loaded traffic. The up road is typically 41kg rail with 1-in-2 interspersed steel and timber sleepers. The down track rail is continuously welded and the up track rail is welded in 220 metre lengths.

The Helidon to Toowoomba section is single track, with steep climbs up the Toowoomba Range, with five passing loops. It is predominantly 50kg carbon rail or 50kg head hardened rail however there are curved sections of 41kg rail on the Toowoomba Range.

There are 11 tunnels in the system between Rosewood and Toowoomba. The tunnels are maintained through minor maintenance works.

All concrete-sleepered track rails in this section are continuously welded. Non concrete-sleepered track is in 110m lengths (or 220m lengths) except in check rail curves where the rail is in 28m lengths. The lower range loops are 41kg rail and upper range loops are 50kg rail.

Toowoomba to Jondaryan

The Western Line is straight track with less than 9km of curves. Toowoomba to Oakey is 50kg Continuously Welded Rail (CWR) with small sections still being 41kg CWR. Oakey to Jondaryan is predominantly 41kg rail at 220m lengths, with a small percentage upgraded to 50kg rails on concrete sleepers in 2014 and 2015.

Jondaryan to Miles

Jondaryan to Miles is predominantly 41kg rail in either 110m or 220m lengths with interspersed 1 in 2 steel and timber sleepers. As above the majority of this section is straight track with minimal curves.

Structures

Bridges in the West Moreton System are predominantly timber structures which were constructed between 1865 and 1880. The table below documents the split between concrete, steel and timber bridges.

West Moreton Bridges		
	metres	number
Concrete	583.05	18
Steel	347.44	11
Timber	3954.7	109

There are 700 drains in the West Moreton System that range from corrugated metal pipes, reinforced concrete box culverts, reinforced concrete pipes and cast in-situ drains, to old heritage listed stone pitched arch drains.

Corridor Protection

Fencing through urban and selected rural areas is used to help ensure people or livestock are unable to access the corridor. These range between 1.2m to 1.8m high fences.

Asset Issues and Deficiencies

Formation

There are many challenges with the current formation that result in sub-optimal performance. These include age, increased tonnage and use, seasonal weather conditions such as heavy rain and unstable ash deposits from the original steam trains. These challenges stem from the historical use of non-engineered formations built on black soil plains.

Over the past decade some 18km of formation has been upgraded. Works are prioritised on the extent of the formation failure together with location and speed restriction impacts. Repair activities include the renewal of the formation and installation of drains. High level estimates show that there is approximately 200km of formation to be upgraded to ensure that the poor black soil and ash formations are removed and an engineered solution is put in place.

The Toowoomba Range has suffered major landslides in recent history due to flooding. The range is geotechnically unstable which presents challenges to the reliability of the West Moreton System in the supply chain.

Rail

The Toowoomba Range and Little Liverpool Range have tight radius 41kg check rail curves which are subject to high wear rates. This wear contributes to the degradation and failure of check rail bolts.

The 41kg rail in the system is in fair condition having wear and emerging internal defect issues becoming apparent. The majority of rail defects picked up through Non Destructive Testing (NDT) are found in the 41kg rail sections. Areas of immediate concern include sections around the 60-63km up road on the Main Line where corrugations are becoming apparent. There are also sections of relay that are required on the up road sections between Yerongmulu and Forest Hill. Relay through this section will eliminate approximately 4km of 41kg rail nearing life-expiry. 2.2km of relay also needs to be done between Gatton and Grantham to eliminate life-expired 41kg rail.

The 41kg rail on the Western Line west of Jondaryan is still in an operational condition, however between Jondaryan and Dalby it needs to be closely monitored having shown high defect levels in 2010 and 2011.

The immediate issue west of Jondaryan is rail creep and the occasional broken joint/pull apart. Work is being done to weld rails into 220m lengths to reduce the number of joints and gain stability. Creep will be monitored and anchorage of timber sleepers may be necessary.

Sleepers

The West Moreton system has approximately 635,000 sleepers. The average life of a timber sleeper is less than 17 years as opposed to 20 years in the past. This is due to poor supply of quality hardwood timbers. The table below shows approximate sleeper numbers by sleeper type.

West Moreton Sleepers	
	number
Concrete	187,000
Steel	200,000
Timber	248,000

Currently there is interspersed timber and steel-sleepered track with defective timber sleeper percentages approaching Civil Engineering Track Standards (CETS) limits between Macalister and Chinchilla. Intervention in these areas has been progressed by maintenance gangs however the efficiencies of mechanised resleepering are required.

Sections of track are creeping east on the Western Line between Malu and Bowenville. This section is 1-in-2 interspersed steel and in line with CETS, the timber sleepers are not anchored. While they supply load bearing support, they do not provide any longitudinal rail constraint.

Ballast

Of the 435km of track in the system, approximately 125km has been renewed in the past 10-15 years. The ballast fouling is due predominantly to the poor formation materials. This fouled condition causes poor drainage, breakdown of the ballast stone, formation damage and loss of top and line.

Turnouts

Turnouts in the system are in good condition with the main line turnouts being upgraded to 60kg Rail Bound Manganese (RBM) on concrete bearers over the last decade. 7 Swing Nose Crossings (SNX) were installed east of Toowoomba. Timber bearer turnouts are in place where joining infrastructure enters the system.

The Willowburn Yard has turnouts that are in poor condition. The four access turnouts are sites of recent derailments. These turnouts are 41kg 1-in-8 turnouts on timber bearers. Yard turnouts are generally fitted with older style reversible Victorian levers.

Structures

The current defect situation shows that the bridges in the system are in a reasonable condition for the current loading situations. Reductions in bush timber skills and availability of quality materials is becoming an issue for Queensland Rail. Non-standard piers and pier type configurations are more evidenced with capsilling and butt splicing of piles being undertaken in lieu of driving timber piles. This is an issue west of Jondaryan with straight wide-centred piled piers pushing under traffic. Timber bridges on the Toowoomba Range are generally tall, requiring scaffolding and those off the main road are difficult to access in wet conditions.

There are two old poured in-situ concrete bridges, one major structure at Lockyer Creek sustaining undermining and cracking in the 2011 floods.

These bridges in the West Moreton System have recently been reviewed by Aecom. This high level study was undertaken to determine the structural adequacy of the West Moreton bridge assets for future upgrades of the system to achieve either a combination of increased tonnages, increased axle loads and longer trains.

One of the recommendations from the study was a requirement for further detailed investigations into some of the bridges analysed. These bridges were shown to have structurally deficient components, including fatigue, for existing traffic when analysed against the new design requirements.

The analysis also showed that the timber bridges were structurally deficient when assessed against the Australian Standard but have been proven to have sufficient capacity to support the existing trains. To allow these bridges to remain in service a performance based assessment is used which requires that the train loadings do not increase and that a maintenance program is in place to preserve their condition.

Components within some of the steel bridges in the System are theoretically currently in fatigue and require further assessment to determine what remediation work is required to correct this fatigue issue.

Drains on the Toowoomba Range are critical to the reliability of the network on the range. These drains are inspected six-monthly as opposed to the 2-yearly requirement of Civil Engineering Structure Standards (CESS). This ensures all drains are kept in a clean, safe and reliable condition. Many of the drains are heritage listed and the maintenance to keep them in their original condition is onerous.

There are various drains through the system including drains between Malu and Bowenville that are of old cast in-situ construction. Two of these drains are being replaced by the current capital program.

Recent inspections have shown that a large set of culverts in Grandchester are also suffering from concrete defects. Maintenance gangs are currently doing remedial works on these culverts.

There are 11 tunnels on the Toowoomba and little Liverpool Ranges. These are old structures which limit the dimensional capacity of container freight traffic to 8'6" containers. Typically the tunnels require little to no maintenance.

Geotechnical

There have been two incidents (2011 and 2013) where the slopes on the Toowoomba Range have failed and the rail corridor has not been available for traffic (both following heavy rainfall events). These embankment and cutting slips cause delays to rail services and require call outs to maintenance staff and contractors for clearance and repairs to track.

In January 2011 the railway corridor along the Toowoomba Range was closed for three months due to flooding events. Following this incident, risk management assessments were undertaken which determined that further geotechnical assessments of the Toowoomba Range are required to progress the design of engineering works to give early warning of slope instability and rock falls at identified high risk locations.

In January 2013 the range was closed for three weeks due to circular slip of the formation as a result of a significant rainfall event.

The Toowoomba Range presents challenges to the reliability and credibility of the West Moreton System as a critical link in the supply chain.

Asset Strategy

The strategy for the West Moreton System is to reduce the maintenance costs per tonne by delivering low maintenance innovative solutions. This includes the installation of concrete check rail curves on the Toowoomba Range, a shift away from timber sleepers and bridging, and progressively improving the strength and integrity of the formation and track structure. The initial focus will be on the more heavily trafficked Down Road and single track between Rosewood and Jondaryan. This will involve a joint capital and maintenance plan that targets the sustainable and efficient replacement and upgrade of life expired assets.

In aiming to accommodate potential future increased axle loadings (above 20tal) all new structures east of Jondaryan will be constructed to 300A loading. To the west of Jondaryan a lower 200A standard can be used provided 20tal is accommodated. All track components are to provide minimum of 20tal capacity.

Formation

The original formation of the West Moreton System was not designed for the current axle loadings or tonnages (in effect it was not designed at all, just constructed from the natural surrounding earth). This is impacting on the performance of the system and therefore an engineered formation will replace the existing formation where required.

Under the current traffic projections there is a requirement to upgrade approximately 5km of formation per year. This will be upgraded in conjunction with relay works where feasible. This level of production currently maintains reliability and reduces maintenance costs in other activities.

Rail

Due to high tonnages the eastern part of the system (east of Jondaryan) requires 50kg rail to be utilised throughout within 10 years. West of Jondaryan the aim is to maintain the existing 41kg rails where possible and when upgrades are required (due to wear or increased internal defect growth) then 50kg rail will be used. Should the Macalister mine reopen consideration may be given to re-railing portions of the track between Jondaryan to Macalister.

In accordance with CETS the use of head hardened rail is required for all 600m or tighter radius curves and up to 1,000m radius curves where annual tonnage is above 10Mgt. All other track sections shall have standard carbon rail.

The progressive upgrade of lubricators to a minimum Portec standard is required. Electric lubricators allow remote monitoring and quality lubrication and are the preferred installation for the concrete check rail and tight radius curves. Lubricators will extend the life of the rail by reducing rail wear plus reducing noise where required.

Sleepers

The long term strategy is to reduce the need for resleepering the West Moreton System. Composite and concrete sleepers have a life of approximately 50 years. Replacing defective timber sleepers with concrete and composite sleepers will assist this strategy. Recovered steel sleepers can be cascaded to west of Macalister.

The short term goal is to eliminate timber sleepers on all loaded coal train tracks east of Jondaryan with full or medium depth concrete sleepers. West of Jondaryan the aim is to use alternative (i.e. composite) type sleepers from the FY2020/21 resleepering run at which time it is anticipated they will be proven and economically available.

Ballast

To comply with standards “A” grade ballast shall be used on all concrete sleepered track and “B” grade shall be used for all timber and steel sleepered track due to ease of maintenance.

Fouled ballast sections (predominately Oakey to Dalby) are approaching intervention limits and consideration needs to be given to undercutting targeted sections. Ground penetrating radar (GPR) investigations west of Toowoomba (undertaken 10-plus years ago) were not able to distinguish the difference between the formation and ballast indicating full ballast contamination. Further analysis of ballast contamination, including investigations into the use of newer and improved GPR technology, will allow more sophistication in the prioritisation of ballast upgrades/undercutting.

Turnouts

Under current operations there is no requirement for a main line program of turnout upgrades.

As part of the connection agreement with Aurizon most connecting turnouts will need to be progressively upgraded within Willowburn yard.

When agreement can be made with the adjoining infrastructure owners, the few timber bearer turnouts still remaining will be replaced with 60kg turnouts with RBM V’s and concrete bearers.

Structures

The long term strategy is to eliminate timber bridges throughout the system with concrete structures. These upgrades shall be done in a way to gain efficiencies such as developing packages of work for contractors as opposed to single structures. To eliminate the existing 3,900m of timber bridging over the next 20 years will require an average of 200m of bridging upgraded per year. However any increases in system wide tonnages above current contracted tonnages will trigger a significantly increased replacement strategy.

Steel structures that have been identified as having fatigue and loading issues shall also be replaced. These replacements shall be with concrete structures.

All new replacement structures should be designed so that there is no adverse increase to upstream afflux and an equivalent waterway no smaller than the existing is provided. While Q100 flood immunity is preferred, each site is to be individually assessed to optimise cost, constructability and hydrological outcomes.

Gradual replacement and/or upgrades of drainage structures through the system are required. These replacements shall take into account priority issues such as drains with special concrete defects, deformed corrugated metal pipes and old heritage listed drains. The Toowoomba Range is also a priority for drainage structures. The drains on the range are to be kept in an optimal condition to minimise the risk of future geological issues.

Geotechnical

Presently the risk of geotechnical failure of the range is being managed by monitoring, and ensuring drainage is working throughout. The range is being visually inspected on a weekly basis with measurements being taken at 31 sites of concern by local staff and four significant sites are being monitored by a surveyor. Two sites have tilt meters installed and are connected to an alarm system. This work will improve safety and allow trains to be stopped before they encounter geotechnical failures at these high risk locations. This information is being monitored by local staff in conjunction with geotechnical consultants. Half of the sites being monitored are demonstrating movement with two major sites showing significant movement.

A geotechnical consultant has been engaged by Queensland Rail to undertake a scoping study comprising geotechnical and hydrological risk assessment on the Toowoomba Range. The work commenced in April 2014. A major component of the work includes a field survey to assess the current condition of the railway corridor with respect to geotechnical stability, and identify potential risks. It is anticipated that over the next four years the four significant sites will require intervention to stabilise the slopes. This work will inform the scope of the future works to improve the integrity and stability of the rail corridor on the range.

Corridor Security

Over the last 10 years fencing has been installed in locations requiring security from livestock or trespassers. Due to changing land usage continued maintenance and new fencing will be carried out to ensure the security of the corridor.

4.4 Signals, Control and Train Protection Assets

Asset Description

Remote Controlled Signalling (RCS) is used from Rosewood to Willowburn. Direct Traffic Control (DTC) is used from Willowburn to Miles.

The RCS territory consists of relay and processor based interlockings. These interlockings are located trackside. Train detection is primarily through track circuits, with axle counters used in sections.

The Train Control Centre for the West Moreton System is located in Railcentre 1, Brisbane. The Universal Traffic Control (UTC) system, developed and maintained by Queensland Rail, is the traffic

management system used to control the RCS territory. The DTC system, also developed and maintained by Queensland Rail, consists of Controller Workstations located in the Train Control Centre, and on-board computers installed on vehicles operating in the DTC territory.

Automatic Train Protection (ATP), specifically WESTECT ATP, is currently installed from Ipswich to Toowoomba, and is designed to automatically stop trains from passing a signal at red or over-speeding.

Wayside detection asset protection systems are used to identify mechanical defects and operational errors early, provide timely warnings to above and below rail operators of mechanical defects or operational errors on rollingstock that can adversely affect the rail infrastructure and subsequent operational effectiveness and safe running of services.

Current systems installed in the West Moreton System include:

- Dragging Equipment Detectors (DED);
- Hot Bearing Detectors (HBD);
- Environmental Monitoring Stations (EMS); and
- Overload and Imbalanced Load Detectors (OILD).

Asset Issues and Deficiencies

The axle counters used from Rosewood to Rangeview are life-expired and are no longer supported by the manufacturer.

The network radio component of the WESTECT ATP system needs to be relocated to the 400MHz narrowband rail industry spectrum at the direction of the spectrum regulator, the Australian Communications and Media Authority (ACMA). Stage 1 encompassing SEQ and parts of the North Coast Line and West Moreton System is to be completed by December 2015. As a result, the WESTECT ATP encoders will need to be reworked to align to the new spectrum requirements. Further, the existing encoders are nearing end-of-life. A new platform for the encoders is currently being considered.

There are a number of signal interlockings that will require refurbishment or replacement in the coming years to ensure ongoing reliability and supportability.

The West Moreton System does not have a full suite of network protection systems covering the full system. There is a requirement to increase and upgrade the network protection systems to cover more locations and ensure critical infrastructure is protected.

The pending changes to the Train Control Radio will require changes to the current Environmental Monitoring Stations and Level Crossing Monitors to ensure compatibility.

Asset Strategy

The signal interlockings are a key component of the RCS system. Relay interlockings have a planned service life of 35 to 45 years. There is potential to extend these interlockings through refurbishment programs. Processor-based interlockings have a planned service life of 10 to 15 years, though a mid-life upgrade can generally be employed to extend this to 25 years.

As part of re-signalling works, a number of strategies will be adopted as follows:

- Processor based interlockings to replace relay interlockings when they reach end-of-life;
- Consistent use of technologies on a corridor to simplify maintenance procedures;
- Isolated/protected input and output circuits for improved reliability;
- Line circuits to be protected by relay interfaces for improved reliability;
- Signals to be LED for improved safety and reliability;
- Level crossing lights to be LED for improved safety and reliability; and

- Vital Disabling Panels (VDPs) considered at level crossings to maximise available time during line closures for maintenance activities.

The UTC and DTC systems are being maintained to ensure they can be supported into the future, including upgrades to supported operating systems where required. Functionality upgrades to the DTC system will be explored to provide operational improvements where warranted.

There is considerable doubt as to whether the above rail operators are utilising WESTECT ATP in the West Moreton System. Given this uncertainty, it is planned to avoid or defer as much investment in the WESTECT ATP system as possible until a clear strategy has been developed. Queensland Rail is working with Aurizon to establish the business requirements for ATP moving forward.

The following capital projects are currently being progressed:

- Level Crossing Compliance: Macalister-Bell Rd, Macalister & Malu Quarry Access Rd, Malu;
- Siemens AZ S 600 Axle Counter Replacement: replacement of AZ 600 axle counters Rosewood to Rangeview with similar, current technology axle counters.

Additional projects to address the refurbishment or replacement of signal interlockings approaching end-of-life will be explored.

Expansion of asset protection systems to new locations and upgrading existing installations will provide enhanced protection of the infrastructure asset. Early identification and intervention of operational and mechanical errors will reduce the risk of damage to the rail network and rollingstock. Implementation of strategically located wayside detection systems will allow network controllers and above and below rail operators to take a proactive approach to preventing asset damage and ensuring rail safety. Additional benefits include the improvement in the reliability of existing infrastructure, a reduction in breakdown maintenance and improved on time running of trains through greater availability of the system.

Expansion of network protection systems to new locations and upgrading existing installations will provide enhanced protection of the network, including:

- Dragging Equipment Detectors (DED);
- Environment Monitoring Stations (EMS) – includes Ambient and Rail Temperature, Flood Level Monitors, Rain Gauges and CCTV;
- Wheel Impact Load Detectors (WILD);
- Overload and Imbalanced Load Detectors (OILD); and
- Hot Bearing Detectors (HBD) and Hot Wheel Detectors (HWD).

4.5 Telecommunications Assets

Asset Description

Remote Controlled Signalling is provided over the operational communications network, consisting of optical fibre systems from Rosewood to Helidon (7 sites), microwave radio Helidon to Toowoomba (8 sites), and microwave radio Toowoomba to Miles (8 sites).

Condition monitoring (rainfall, river height, and rail temperature) is provided over the Maintenance Supervisory Radio system and 3G cellular data (e.g. Telstra NextG). Business communications (corporate LAN and telephones) at depots are provided over the operational and data networks and third-party carrier services.

Asset Issues and Deficiencies

The train radio and maintenance supervisory radio networks are required to relocate to the 400MHz narrowband rail industry spectrum at the direction of the spectrum regulator, the Australian Communications and Media Authority (ACMA). Stage 1 will deliver a digital radio platform for the train

radio network covering West Moreton from Rosewood to Columboola only with completion expected by December 2015. The project covers the base network, on-track vehicle / rolling stock and hand-held radios.

It is anticipated that condition monitoring stations will be migrated from maintenance supervisory radio to either the digital radio platform or to 3G cellular data.

The Rosewood to Helidon direct-buried optical fibre cable is reaching end of life and will require replacement in the next 5 to 10 years. The LEDR microwave to Murphy's Creek, Holmes, Spring Bluff and Ballard East is end of life. End of life LEDR microwave from Toowoomba to Miles will be renewed under the Train Radio project.

The data network has known deficiencies as advised by the manufacturer, equipment that is no longer supported, and requires upgrade to provide capability for VoIP telephones.

Asset Strategy

The current strategy is to maintain and improve the current operational and data networks in line with business requirements. Network reliability is to be maintained and/or improved by managing the equipment lifecycle, replacing end of life and/or unreliable equipment, providing redundancy and monitoring where required, and migrating systems to modern networks.

The operational network is to be selectively renewed to replace obsolete and unreliable equipment from the network. Queensland Rail is currently migrating some operational systems from voice bearers and modem communications to Ethernet/IP. Ethernet/IP networks permit greater information capacity, monitoring, and diagnostics, and more flexible use of third party/carrier services (e.g. business grade DSL and cellular data).

The optical fibre network is to be maintained until renewal is required.

The digital radio platform is an enabling technology for DTC automatic code exchange. This is also a consideration for stage 2 of the project.

The following capital projects have been initiated to address the system deficiencies, with outcomes aligning with the system strategies:

- Train Radio Network Replacement is a $33M project over 18 months delivering a digital radio network for train operations in the SEQ and West Moreton Systems. The project will deliver base stations, rollingstock radios, and operational Ethernet backhaul network;
- LEDR Radio System Replacement is a $240k project to replace the end of life LEDR microwave to Murphy's Creek, Holmes, Spring Bluff and Ballard East; and
- Data Network Renewal is a $1.1M state-wide project over 2 years to address known deficiencies, replace end of support equipment, and provide capability for VoIP telephones.

5. Resourcing and Corridor Delivery Strategy

Queensland Rail is improving the planning, scheduling and execution of the works required to maintain and renew network assets. Planning improvements help ensure the delivery of maintenance with the right priority at the right time in the right location to deliver a resilient network asset to the supply chain.

When maintenance closures are performed they will fall into one of the following types:

- A = 48 hours Saturday / Sunday;
- B = Nil Possession;
- C = 12 hours Sunday; or
- D = 12 Hours Monday.

One A closure will be scheduled within each month with no closures the following week. During the month C and D type closures will be scheduled at other times.

Resourcing of these plans will be achieved by utilising:

Network West Moreton Maintenance & Renewals Resources:

- In-house provider of maintenance and renewals services;
- Specialised narrow gauge rail construction and maintenance services (provided by Network Delivery (SEQ));
- External contract labour and sub-contractors to support internal capabilities;
- Internal procurement and management of critical inventory.

Network Engineering Resources:

- In-house provider of engineering expertise;
- Includes expertise in track, civil, signalling and operation systems;
- Supplemented by external industry for the delivery of engineering design;
- Panel providers in place to allow for complete packages of work to be delivered by the external engineering industry.

Queensland Rail Project Management:

- In-house project management and contracts management provider;
- Manages engagement of Collaborative Management Agreement providers;
- Manages internal and external resources aligned to portfolio works;
- Manages projects of significance and complexity requiring strong project management discipline and/or contracts administration.

Service Contract Panel Providers:

- Panel providers for track & civil, signalling & telecommunications, and network facilities;
- Enable flexible resourcing solution via preselected providers;
- Have high understanding of business environment and possess significant skills and capabilities.

Service Contract Providers:

- Contract providers for maintenance & renewals services;
- Includes specialised rail services e.g. rail grinding, ultrasonic testing;
- Provide specialist services and other services that complement internal capability.

6. Capital Program

6.1 Capital Investment Planning

Queensland Rail is refining its approach to capital investment in recognition of the fact that effective investment planning requires clear and concise linkages to corporate strategies, top-down direction that drives priorities, and an agreed framework and established criteria for selecting investments. Organisational KPI's aligned to "products" (e.g. Citytrain) are the linking mechanism between strategic planning, asset planning and program planning. Having the right KPI's in place ensures:

- The focus of investments is on maintaining or improving organisational performance;
- Quantified and measurable benefits targets are defined; and
- A capital planning framework can be developed for determining investment priorities.

Programs that link to the strategic KPI's have been formed. These are set up to meet an investment strategy and performance outcomes. Projects within each program are required to develop justification based on measurable contributions to KPI's. Ranking techniques are then applied to reach recommended inclusions and exclusions. The following work streams are being progressed in order to refine the capital planning process:

1. Improve capital plan alignment to strategic KPI's;
2. Refine capital programs and mandates;
3. Integrate capital planning framework with finance and SAP;
4. Roll out revised capital planning cycle, governance model and reporting;
5. Enhance asset planning and project identification (asset management framework); and
6. Assess capital plan achievability.

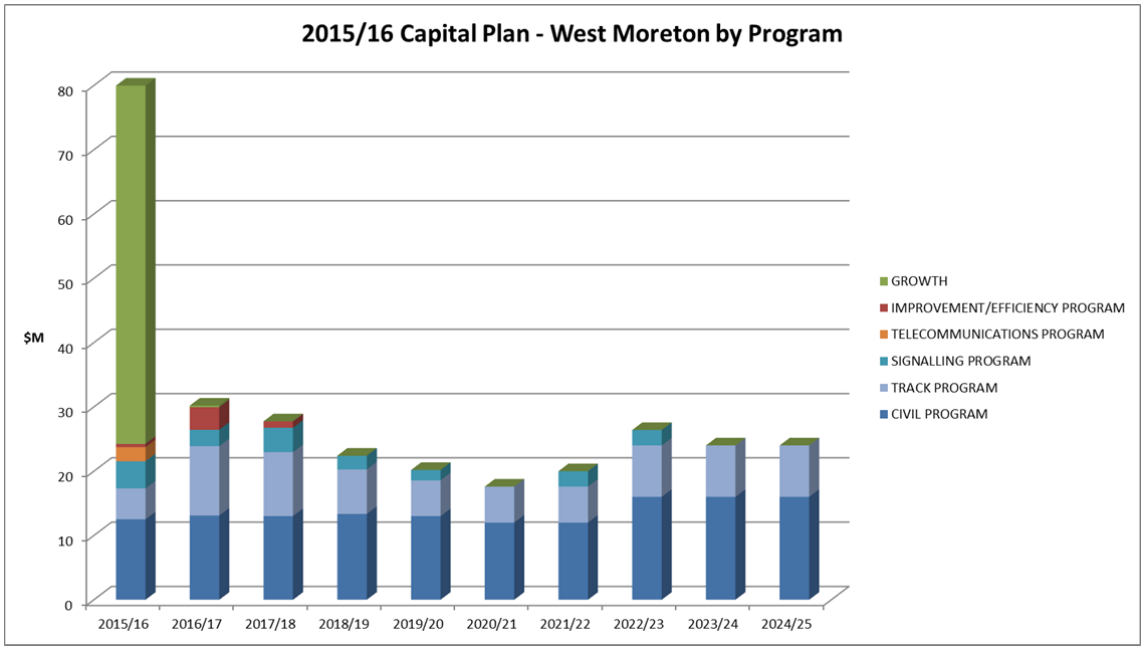
6.2 Network Asset Management Framework

Network is currently developing an asset management framework to demonstrate clear linkage between asset condition and capital and maintenance programs of work. With the introduction of EAMS, Network is better able to capture asset-related information in a single system and build a comprehensive asset lifecycle representation for each asset type. Development of the framework will involve a number of steps to clearly demonstrate the condition, criticality and risks associated with network assets in a consistent manner, as outlined below:

1. Define asset types and build degradation models for each type in order to better predict intervention points within the asset lifecycle. Currently within EAMS asset lifecycles are based on the economic lives of the relevant asset types. Degradation models will enable surveyed condition and asset criticality to be combined to reforecast replacement or intervention timeframes;
2. Assess assets against a condition and criticality framework for each asset type;
3. Refine and utilise asset management prioritisation tools (such as heat maps) to formulate programs of works linked to organisational KPI's; and
4. Continue to integrate this framework with EAMS to ensure ongoing consistency in asset management planning.

6.3 Baseline Program

The graph below illustrates planned expenditure on the growth, safety and renewals-focussed programs of works required to ensure the West Moreton System continues to be a safe, reliable and cost-effective network over the next ten years. The projects included in the West Moreton capital program are outlined in Attachment 1. These projects are included in Queensland Rail's 2015/16 Capital Plan and May 2015 Access Undertaking submission to the QCA, and are funded via access revenue, the TSC or other government funding (e.g. grants).



7. Maintenance Plan

The summarised Maintenance Plan below outlines the operational programs of works that are required in order to ensure the West Moreton System continues to be a safe, reliable and cost-effective network over the next ten years. The maintenance product detail included these programs is shown in Attachment 2. The Maintenance Plan is funded via access revenue and the TSC.

West Moreton Maintenance Plan 2015/2016 Product Description	Budget FY16 ($'000)	Budget FY17 ($'000)	Budget FY18 ($'000)	Budget FY19 ($'000)	Budget FY20 ($'000)	Budget FY21 ($'000)	Budget FY22 ($'000)	Budget FY23 ($'000)	Budget FY24 ($'000)	Budget FY25 ($'000)	Total FY16 - FY25 ($'000)
Structures and Civil	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	35,539
Ballast Undercutting	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	15,095
Earthworks	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	1,109
Track Maintenance	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	149,350
Resurfacing	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	33,236
Rail Grinding	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	6,328
Track Monitoring	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	4,547
Plant Maintenance	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
TRACK AND CIVIL Total	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**245,206**
FACILITIES Total	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**3,003**
Telecommunications	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	1,094
Signal Maintenance	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	18,240
SIGNALLING Total	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**19,333**
GENERAL Total	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**10,259**
GRAND TOTAL	**39,521**	**20,706**	**26,339**	**19,755**	**21,968**	**25,135**	**43,158**	**26,407**	**27,068**	**27,744**	**277,801**

Attachment 1 – 2015/16 Capital Plan – West Moreton

Project ID	QCA Capital Item	Project Name	Program	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	Total
B.04044	2	Formation Strengthening - West Moreton System	CIVIL PROGRAM											3,006
APR 12458	3	TIMBER BRIDGE UPGRADES - WEST MORETON SYSTEM	CIVIL PROGRAM											28,099
NEWCIVIL5	9	Steel Bridge strengthening	CIVIL PROGRAM											2,000
B.04043	3	Timber Bridge Upgrades - West Moreton System	CIVIL PROGRAM											1,999
APR 12548	1	TOOWOOMBA RANGE SLOPE STABILISATION	CIVIL PROGRAM											7,500
APR 12454	4	TIMBER & STEEL BRIDGE REPL. WITH RCBC WEST MORETON	CIVIL PROGRAM											2,200
NEWCIVIL4	2	FORMATION STRENGTHENING - WEST MORETON System	CIVIL PROGRAM											12,130
NEWCIVIL2	5	Drain Renewal West Moreton	CIVIL PROGRAM											7,000
REGCIV003	3	ISAAC ST TIMBER BRIDGE UPGRADE TOOWOOMBA	CIVIL PROGRAM											1,000
REGCIV017		PROGRAM CIVIL PROGRAM - WEST MORETON	CIVIL PROGRAM											72,000
			CIVIL PROGRAM TOTAL											**136,934**
B.04163 (WM Portion)	15	Corridor & Asset Protection (WM Portion)	CONDITIONING MONITORING PROGRAM											1,758
NEW	15	Corridor & Asset Protection (WM Portion)	CONDITIONING MONITORING PROGRAM											1,025
			CONDITIONING MONITORING PROGRAM TOTAL											**2,783**
APR 12657		Toowoomba Range Capacity and Clearance Upgrade	GROWTH											55,995
			GROWTH TOTAL											**55,995**
SEQFAC015		Toowoomba Plant Maintenance Depot	IMPROVEMENT/EFFICIENCY PROGRAM											5,000
			IMPROVEMENT/EFFICIENCY PROGRAM TOTAL											**5,000**
NEWSIGNALWM02	20	Upgrade of 4.5V Solar Track Feed to 12V Helidon to Lockyer (3), Forest Hill to Laidley (3), Yarongmalu (1)	SIGNALLING PROGRAM											385
NEWSIGNALWM03	21	Upgrade of Model 10 Boom Mech	SIGNALLING PROGRAM											300
NEWSIGNALWM04	22	Upgrade Alternators Grandchester, Yarongmalu, Rangeview	SIGNALLING PROGRAM											450
NEW	16	DIGITAL TELEMETRY (WM)	SIGNALLING PROGRAM											960
B.04075 (WM Portion)	11	Level Crossing Compliance - Regional (WM Portion)	SIGNALLING PROGRAM											3,930
B.04196	13	Siemens AZ S600 Axle Counter Replace West Moreton	SIGNALLING PROGRAM											1,071
B.04073 (WM Portion)	12	Pedestrian Crossing Installations & Upgr (WM Portion)	SIGNALLING PROGRAM											1,150
NEWSIGNALWM01	19	Signalling Pole Route Upgrade Grandchester to Laidley	SIGNALLING PROGRAM											850
B.04115	17	DTC Automatic Code Exchange	SIGNALLING PROGRAM											460
APR 12445 (WM Portion)	18	Level Crossing Install Remote Monitoring (WM Portion)	SIGNALLING PROGRAM											525
B.04064 (WM Portion)	14	ATP Encoder Replacement (WM Portion)	SIGNALLING PROGRAM											500
B.04086 (WM portion)	13	Siemens AZ S 600 Axle Counter Replacements West Moreton	SIGNALLING PROGRAM											511
NEWSIGNALWM05	23	Upgrade Asbestoses Loc Boxes	SIGNALLING PROGRAM											450
NEW	12	Pedestrian Crossing Installations & Upgr (WM Portion)	SIGNALLING PROGRAM											2,750
REGSIG004		PROGRAM SIGNALLING PROGRAM - WEST MORETON	SIGNALLING PROGRAM											4,800
			SIGNALLING PROGRAM TOTAL	**4,214**	**2,553**	**3,790**	**2,130**	**1,605**	**0**	**2,400**	**2,400**	**0**	**0**	**19,092**

Project ID	QCA Capital Item	Project Name	Program	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	Total
B.04055 (WM Portion)	24	Train Radio Network Replacement (WM Portion)	TELECOMMUNICATIONS PROGRAM	[redacted]										2,125
APR 12795 (WM Portion)	25	LEDR Radio System Replacement West Moreton System	TELECOMMUNICATIONS PROGRAM	[redacted]										69
			TELECOMMUNICATIONS PROGRAM TOTAL	[redacted]										**2,194**
B.04047	6	CHECK RAIL CURVES - TOOWOOMBA AND LITTLE LIVERPOOL RANGE	TRACK PROGRAM	[redacted]	[redacted]									5,971
APR 12545	8	RELAYING (Rerailing) PROGRAM ROSEWOOD - HELIDON	TRACK PROGRAM	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]						8,200
NEWTRACK6	7	Relay Oakey to Jondaryan	TRACK PROGRAM	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]						13,042
APR 12540	6	CHECK RAIL CURVES - TOOWOOMBA AND LITTLE LIVERPOOL RANGE	TRACK PROGRAM	[redacted]	[redacted]	[redacted]	[redacted]							9,286
NEWTRACKWM01	10	Level Crossing Reconditioning West Moreton	TRACK PROGRAM	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]						1,600
REGTRACK012		PROGRAM TRACK PROGRAM - WEST MORETON	TRACK PROGRAM	[redacted]					[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	35,200
			TRACK PROGRAM TOTAL	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]0	**73,299**
			GRAND TOTAL	**81,276**	**31,288**	**28,153**	**22,402**	**20,177**	**17,600**	**20,000**	**26,400**	**24,000**	**24,000**	**295,297**

Attachment 2 – 2015/16 Maintenance Plan – West Moreton

West Moreton Maintenance Plan 2015/2016		Budget FY16 ($'000)	Budget FY17 ($'000)	Budget FY18 ($'000)	Budget FY19 ($'000)	Budget FY20 ($'000)	Budget FY21 ($'000)	Budget FY22 ($'000)	Budget FY23 ($'000)	Budget FY24 ($'000)	Budget FY25 ($'000)	Total FY16 - FY25 ($'000)
Discipline	**Product Description**											
TRACK AND CIVIL INFRASTRUCTURE	Repairs Concrete Bridges	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	150
	Repairs Steel Bridges	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	2,724
	Repairs Timber Bridges	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	15,623
	Steel Bridge Paint (Contract)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	6,200
	Tunnel Repairs	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
	Structures Inspections	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	6,266
	Structures Pest Control	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	164
	Drainage construction	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	1,062
	Drainage maintenance	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	3,151
	Retaining Wall maintenance	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	199
	Footbridge Maintenance	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
	Walkways Construction	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
	Structures and Civil Total	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**35,539**
	Ballast Undercutting (Other)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	15,095
	Ballast Undercutting Total	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**15,095**
	Formation Repairs	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
	Earthworks - Non Formation	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	1,109
	Earthworks Total	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**1,109**
	Minor Yard Maintenance	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	2,280
	Rail Joint Management	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	14,252
	Rail Renewal	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	10,187
	Turnout Maintenance	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	1,672
	Track Reconditioning & Removal	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
	Mechanised Resleepering	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	33,729
	Monument /Signage Maintenance	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	1,253
	Maintenance Ballast	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	11,842
	Sleeper Management	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	9,003
	Fire & Vegetation Management	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	15,317
	Rail Stress Adjustment	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	8,652
	Track Inspections	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	8,590
	Track CleanUp	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
	Rail Lubrication	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	2,842
	Top & Line Spot Resurfacing	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	14,999
	Rail Repair	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	14,731
	Track Maintenance Total	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**149,350**
	Mechanised Resurfacing	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	32,341
	Mech Resurfacing - Turnouts	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	895
	Resurfacing Total	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**33,236**
	Rail Grinding - Mainline	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	5,210
	Rail Grinding - Turnouts	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	1,119
	Rail Grinding Total	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**6,328**
	Track Geometry Recording	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	1,648
	Ultrasonic Test Ontrack Mach	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	2,189
	Ultra Sonic Testing (Manual)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	710
	Track Monitoring Total	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**4,547**
	Fitter/Operator Maintenance	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
	Plant Maintenance Total	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**0**
TRACK AND CIVIL Total		**35,741**	**17,377**	**23,022**	**16,451**	**18,676**	**22,172**	**40,121**	**23,295**	**23,877**	**24,474**	**245,206**

West Moreton Maintenance Plan 2015/2016		Budget FY16 ($'000)	Budget FY17 ($'000)	Budget FY18 ($'000)	Budget FY19 ($'000)	Budget FY20 ($'000)	Budget FY21 ($'000)	Budget FY22 ($'000)	Budget FY23 ($'000)	Budget FY24 ($'000)	Budget FY25 ($'000)	Total FY16 - FY25 ($'000)
Discipline	**Product Description**											
FACILITIES MAINTENANCE	Fencing	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	1,439
	Graffiti Management	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
	Level crossing maintenance	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	995
	Level crossing constr/recond.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	569
	Community flood recovery	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
	Construction	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
	Plumbing	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
	Carpentry	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
	Electrical	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
	Painting	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
	Locksmith	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
	Signage	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
	Electrical Compliance	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
	Fire Compliance	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
	Asbestos Compliance	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
	Pole Compliance	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
	Vandalism	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
	Grass Cutting	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
	Tree Management	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
	Fencing Management	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
	Asphalt Management	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
	Air Conditioner Mgt	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
	Property Mgt	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
	Car Park Mgt	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
	Precinct Mgt	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
	Building Compliance	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
	Pest Control	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
	Cleaning	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
FACILITIES Total		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**3,003**
SIGNALLING	Unplanned Telecoms Bkbone Mtce	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
	Preventative Telecoms Bkbone Mtce	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	1,039
	Phone/Data Maintenance	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	55
	CCTV Systems	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
	Telecommunications Total	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**1,094**
	Prevent Signalling Field Mtce	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	7,979
	Correct Signalling Field Mtce	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	2,254
	Signalling Renewals	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
	Weighbridge Maintenance	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
	Signalling Level Xing Protect	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	5,029
	Signalling Control Systems	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
	Cable Route Maintenance	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	1,903
	Signalling Train Protect Syste	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	491
	Wayside Monitoring System Mtce	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	584
	Signal Maintenance Total	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**18,240**
SIGNALLING Total		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**19,333**
		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**267,543**
GENERAL	Derailment & Collision Repairs	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
	Flood & Natural Disaster Reprs	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
	Inventory & Minor Asset Mgmnt	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	1,272
	Consulting/Technical Advice	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	1,899

West Moreton Maintenance Plan 2015/2016		Budget FY16 ($'000)	Budget FY17 ($'000)	Budget FY18 ($'000)	Budget FY19 ($'000)	Budget FY20 ($'000)	Budget FY21 ($'000)	Budget FY22 ($'000)	Budget FY23 ($'000)	Budget FY24 ($'000)	Budget FY25 ($'000)	Total FY16 - FY25 ($'000)
Discipline	**Product Description**											
	External Work	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
	Asset Management	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	6,792
	3rd Party Damage Repairs	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
	Project Mgmt & Services	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	295
	Audits	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
	Unclaimable 3rd Pty Damage Rep	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0
GENERAL Total		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**10,259**
		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**10,259**
GRAND TOTAL		**39,521**	**20,706**	**26,339**	**19,755**	**21,968**	**25,135**	**43,158**	**26,407**	**27,068**	**27,744**	**277,801**