Review of the Aurizon Network's GAPE Operating and Maintenance Costs

for the Queensland Competition Authority

April 2013

B&H Strategic Services Pty Ltd

Executive Summary

A review of Aurizon's Infrastructure Maintenance and Operations costs for the periods 2011-12 and 2012-13, in relation to the GAPE project, has been undertaken, in order to inform the QCA of technical matters that will assist the Authority in its assessment of the reasonableness of the proposed approach to calculating and the quantum of the proposed O&M costs.

In this review we have taken into account:

(a) forecast traffic profile;

(b) insurance costs;

(c) existing maintenance synergies in the current Goonyella and Newlands infrastructure operations;

(d) cost consistency with other industry benchmarks; and

(e) any other relevant factor

We had, before a revised submission of Aurizon in April 2013, concluded that the basis upon which Aurizon had made its estimates for maintenance is misconceived in that they were based on maintenance costs for highly depreciated assets as evaluated in UT3, whereas the assets being considered for these estimates are new.

When estimating the incremental pathway costs and allocative pathway costs, Aurizon had again attempted to extrapolate the existing UT3 rates derived from other systems to arrive at costs for the GAPE system. The basis for the pathway costs on the existing systems will be different to the basis for the GAPE system if it is treated as a separate system.

The estimates for Operations costs were soundly based as they are sourced from comparable operations cost data.

Overall, Aurizon had attempted to use historical data applicable to railway maintenance and operation which are not comparable to the new and upgraded GAPE system. They had then applied those rates to a completely separate and for all intents and purposes new railway system, an apparent anomaly in linking depreciated mature systems to a brand new system.

In addition, in treating the GAPE system as separate from existing systems, Aurizon had failed to make use of the economies of scale available to such a small system in both the maintenance and operations costs despite the fact that they have pro-rated the costs albeit derived from other systems.

Aurizon could have approached the task by deriving a bottom up estimate based on new assets or they could have incorporated the system into either the Newlands or Goonyella systems or both and made use of the economies of scale. In either case direct costs could have made use of the economies of scale available to it across systems.

During the course of the consultancy Aurizon decided to withdraw its application in relation to maintenance costs and resubmit on the basis of actual costs incurred during the period in question.

This report does not directly address the detail of the reasonableness of those reconsidered estimates of maintenance costs but it has provided a range of maintenance costs that could be considered as reasonable for the GAPE infrastructure.

The conclusions reached in regard to Aurizon's September 2012 submission in this report are:

Aurizon's approach to the estimation of AT1 is inappropriate and that other methods should be used to make that estimate.

Aurizon's estimate for the AT2-AT4 rates are inappropriate.

AT1 be set at zero for the purposes of this Regulatory Period and all maintenance costs recovered through the remaining AT3 & AT4 elements. AT2 will continue to remain.

A suitable range of total maintenance cost is approximately $7,500 to $11,000 per km per year ($2011/12).

The range of expected maintenance cost increase is $1.4m to $2.1 per annum.

The cost per additional path AT2 is recommended as $3,600.

The Aurizon approach to Operations Costs is appropriate.

In April 2013 Aurizon resubmitted its estimates for maintenance costs a summary of which is available at http://www.qca.org.au/files/R-Aurizon-GAPE-SumRev-0413.pdf, wherein Aurizon has estimated recalculated maintenance costs as $0.5m in 2011/2012 and $2.9m in 2012/2013, approximately 15% to 20% of the original estimates.

These estimates fall within a reasonable range for new infrastructure costs and are therefore consistent with reasonable costs.

Aurizon refers to these costs as "preventative and inspection maintenance costs" but the estimates calculated in this report also consider "long run avoidable costs" in the context of the regulatory period that these maintenance costs are applicable. The fact that the regulatory period is short and that these long run costs are unlikely to materialise during the period should not be confused with the requirement to consider them.

Aurizon has chosen to use a small AT1 component in their estimates whereas this report suggests that no AT1 component is applicable. Aurizon has also suggested incremental path costs AT2 as being much higher than those suggested in this report. Both of these items will need to be revisited during subsequent Voluntary Undertakings, but as the overall result is commensurate with reasonable total costs these issues have been ignored in this review.

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1 Background

The Goonyella Abbot Point Expansion (GAPE) project was commissioned and operated its first train in December 2011. The project aimed at alleviation of the capacity pressure on the Goonyella rail and port infrastructure and at utilisation of the Abbot Point Coal Terminal expansion. It included:

(a) construction of the new track linking the Goonyella and Newlands rail systems (the Northern Missing Link);

(b) capacity expansion and upgrades of the Newlands system; and

(c) infrastructure enhancements to the Goonyella system.

In September 2012 Aurizon Network Pty Ltd submitted to the Authority a draft amending access undertaking (DAAU) for the GAPE. In it, Aurizon Network proposed to amend the approved 2010 access undertaking to introduce a reference tariff for train services operating across the GAPE infrastructure.

Operations and Maintenance (O&M) costs make up a significant proportion of any proposed tariff and therefore the Queensland Competition Authority (the “Authority”) requires a review of the technical matters related to these costs for their assessment of reasonableness of the proposed approach to calculating and the quantum of the proposed O&M costs.

2 Maintenance Costs

2.1 Aurizon's Approach

Aurizon has presented two methods to estimate maintenance costs providing therefore some sensibility check as to the robustness of the methods.

In the first approach, Aurizon has recognised two components to maintenance cost, the "incremental" portion linked to the AT1 component of tariff and "fixed" costs normally linked to the allocative component of the tariff.

"Fixed" costs is a misnomer in that the AT3 and AT4 components of the tariff are simply the allocative portion left over after the extraction of AT1 from total costs. The AT3 and AT4 components contain some tonnage dependent costs. The incremental capacity component AT2 is aggregated by Aurizon into the "fixed" or remainder costs associated with access along with AT3 and AT4 whereas it is an incremental pathway cost.

Aurizon has sought to use the data derived for the UT3 period to interpolate a suitable AT1 component for the GAPE system claiming that as it was acceptable for UT3 it should be acceptable for this estimate. In addition, it has claimed that "the access charge should include an amount to cover the long-run incremental maintenance costs".

In the second approach, Aurizon has used its Network Strategic Asset Plan (NSAP) to model the costs, again using the existing systems as benchmarks to calibrate the model.

Aurizon has compared the two approaches and concluded agreement.

On the question of "agreement" between the two approaches, it is quite likely the two approaches would agree because the NSAP Model is calibrated from existing data, as the UT3 data used in the first approach also demonstrates.

2.2 Discussion

2.2.1 The Context of the Submission

The context of the methodology of Aurizon is an important factor in considering the relevance of certain maintenance components and the mechanism of estimate is also relevant in this instance.

In relation to context, Aurizon wishes to establish a stand alone system tariff for GAPE but in maintenance the consequences of that approach would be, for such a small system, to negate the benefits of economies of scale for both direct and indirect costs.

Also in relation to context, the default Regulatory Period for this application is the period January 2012 to June 2013. Therefore, the cost estimates should reflect the costs likely to be incurred during that period and which has due regard to the task during that period. However, Aurizon has claimed "the access charge should include an amount to cover the long-run incremental maintenance costs". The implication is that Aurizon is estimating maintenance cost on a levelised basis over the life of the asset. Aurizon is at

liberty to "include an amount to cover the long-run incremental maintenance cost" as long as the amount is incurred during the Regulatory Period.

This implication is consistent with their approach with regard to the mechanism of estimation discussed in the next section, but necessarily needs to be a predictive approach about the amount of maintenance likely to be encountered in future. Whether or not the maintenance applicable to a brand new modern asset is going to be the same as the maintenance applicable to assets like Goonyella and Blackwater that were built many years ago and have had many upgrades but with fundamentally old configurations, is questionable. One would hope the new railway would perform better in the future than the old railways in maintenance terms because the new railway will be built to modern standards (MEERA[1]) whereas the other railways' earthworks were built to standards of the day, much inferior to today's standards..

2.2.2 The Methodology of Estimates for AT1

Aurizon's Figure 5[2] reproduced below indicates a relationship between AT1 and tonnage where the black dots are those of the existing systems, with the dots to the left sourced from the lower tonnage Moura and Newlands systems and the dots to the right from the higher tonnage Goonyella and Blackwater systems. The higher tonnage systems could be expected to have lower AT1 component rates because on a unit basis their incremental maintenance costs are lower due to the economies of scale. The lower tonnage systems have comparatively higher unit rates.

The rates were of course derived for UT3 where the assets were depreciated and their incremental maintenance was that that could be expected from assets that were fully mature and were being maintained in a steady state through incremental replacements and response to the type of failures that are seen in a mature asset.

The form of the relationship is a reasonable assumption but the position of the line on the chart is not commensurate with the life cycle position of the asset for the GAPE system, being essentially new[3] in all of the components of the asset that are subject to the bulk of maintenance requirements. That is, the rail, sleepers, and ballast, and those things above formation level. As the whole of the GAPE system has had all of these components recently renewed and the Northern Missing Link has been freshly constructed, none of these components could expect to have any maintenance associated with the usual wear and tear of a mature railway.

The tonnage expected over the period January 2012 to June 2013 is in the range 16 to 20 million gross tonnes. Combined with the advantages of a defects liability period, which usually extends for 12 months after commissioning, the maintenance work could be expected to be mainly associated with inspections. Given that rail grinding is now

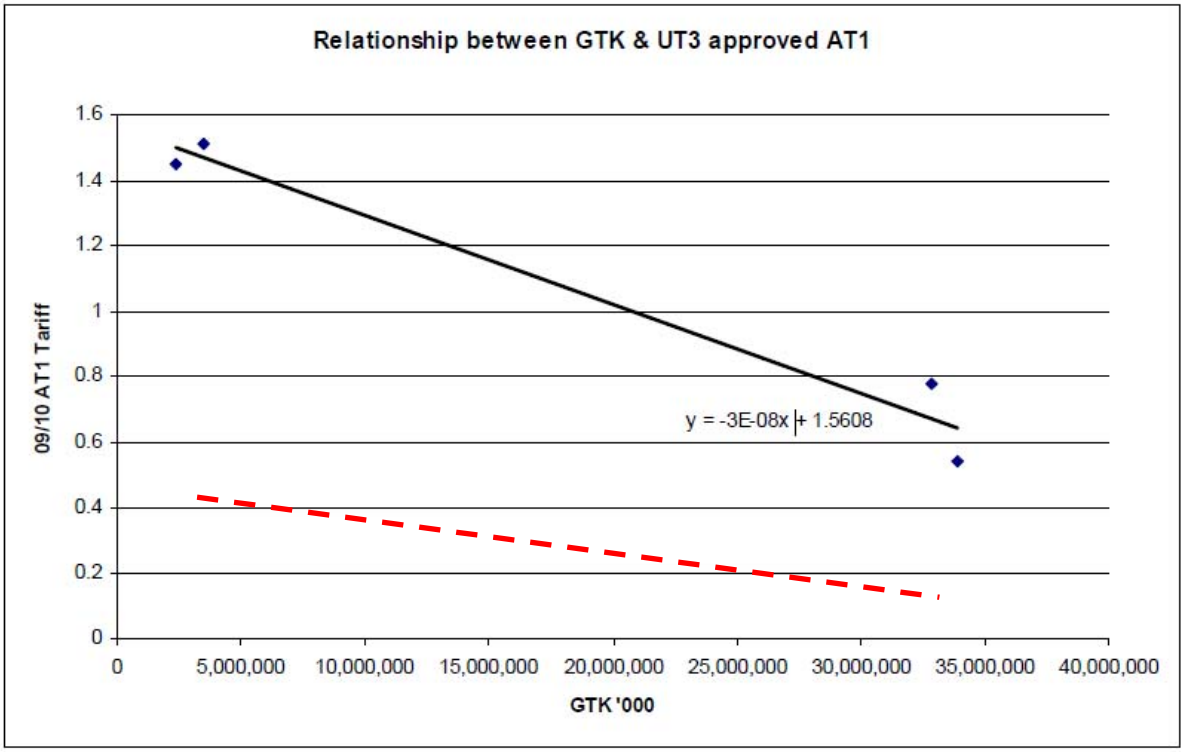
[1] Modern Engineering Equivalent Replacement Asset
[2] Aurizon's Draft Amending Access Undertaking Reference Tariff for the GAPE System
[3] Some elements of the Newlands System were not upgraded to 26.5t axle load capacity because they will be used for empty trains only. All other sections had to be upgraded to 26.5t axle load capacity

usually expected as part of the construction process[4], even that task might not be expected over the first 20 million gross tonnes. Any resurfacing to correct geometric faults would occur during the defects liability period.

In Aurizon's Figure 5 below (our Figure 1) we have plotted an indicative trajectory of costs in the same format (dashed red line). It shows considerable lower AT1 costs but with similar characteristics and is reflective of a more modern and new railway structure. One could expect the same trend that a lower task results in higher unit incremental cost.

Figure 1 Aurizon's Figure 5

Figure 5: Relationship between GTK & AT1 rates approved for UT3



Therefore we conclude that Aurizon's approach to the estimation of AT1 is inappropriate and that other methods should be used to make that estimate.

2.2.3 The Methodology of Estimates for AT2-AT4

AT2 to AT4 are those components of maintenance and operation as well as incremental capacity together with capital charges that permit Aurizon to recover the balance of total costs that remain after the application of incremental maintenance charges.

[4] It is usually included because construction activities drop ballast and contaminate the head of the rail when crushed by passing ballast trains and equipment, requiring a clean up of the head and where profiling can occur at little extra cost.

Aurizon have relied on the precedent of the Newlands System's AT2-AT4 UT3 rates to calculate the rate for GAPE. Implicitly then they have relied on the AT1 estimates that have been found to be inappropriate.

Therefore we conclude that Aurizon's estimate for the AT2-AT4 rates are inappropriate.

As well, Aurizon have mistaken the purpose of AT2-AT4 rates in that they refer to the rates as being associated with "fixed maintenance" costs. In fact variable maintenance, that is, maintenance associated with usage, is part of the AT3-AT4 rate and AT1 is reflective only of the incremental rate, or the instantaneous change in maintenance cost at a particular tonnage and a particular infrastructure configuration.

2.3 The AT2 Rate

AT2 is the variable path costs and represents the incremental capacity costs. These are those costs on a per path basis of providing one extra path on the system assuming it is at its capacity now. The costs are those generated through capital works of passing loops or duplication or signalling.

The AT2 rate has nothing to do with the installed capacity and its capex as Aurizon have assumed. Aurizon have used the "amortised" capex charges of the GAPE project and divided it by the number of contracted paths. In these two parameters Aurizon have misinterpreted the purpose of AT2.

The installed GAPE system has 13 passing loops or sections of duplicated track. On a single track system the number of passing loops is usually the defining factor in the capacity of the system. For a fully saturated system, where every passing loop has a train "crossing" another, the most conservative[5] way to increase the capacity is to provide other passing loops between each of the existing passing loops, thereby allowing more trains to pass one another mid-section.

Conservatively, if 15 new passing loops were provided at a cost of $10m per loop[6] an increase in capacity could be expected, not double, due to the interactions between trains but estimated as an extra 50%. Assuming the capacity of the existing GAPE system has been optimised to meet the GAPE and NAPE Deed requirements of 9,732 paths, the expected increase with the 15 new loops is 4,866 paths per year.

AT2 is calculated by estimating the annual capital charges of the new infrastructure and dividing by the annual increase in capacity. Using Aurizon's own "amortisation" calculation[7] this amounts to approximately $17.5m.

The cost per additional path and therefore AT2 is recommended as $3,600/train path.

[5] Conservative meaning most expensive, or definitely likely to result in increased capacity. Other ways of increasing capacity by below rail means include improvements to signaling, grade easing, increased curvature cant allowing increased speed and other refinements. Above rail methods are also available.
[6] This estimate is high by benchmarked standards but is provided to illustrate the calculation methodology and also to ensure all passing loop situations can be achieved, such as through difficult terrain.
[7] Over 20 years at the proposed WACC

2.4 Other Methods of Estimation

2.4.1 Background

Once Aurizon was locked in to the notion that the new GAPE System could be assessed in the same way as the existing depreciated Systems, their options for estimation of maintenance costs were limited.

However, if Aurizon had assessed the maintenance of the System on its own merits, for its configuration and its age, a number of different ways were available.

Bottom Up Estimate

A bottom up, zero base, budgeting exercise could have estimated the direct costs since, as most of the System had been upgraded to accommodate 26.5t axle loads, with new rail and sleepers and attention to ballast, or was entirely new.

The main activity for a new railway is inspections and this would be virtually the only activity for two reasons. Firstly, the first 12 months would be cushioned in any maintenance activity by the contracts associated with the new works since a Defects Liability period is the usual[8] construct for work so of this type.

Inspection costs are mainly predictable although drainage concerns during the period are a significant factor of unpredictability due to the heavier rainfall patterns over 2011 to 2013.

Inspections are many and include:

- Visual inspections by hirail[9] of the track and corridor (to fence line)
- Ultrasonic inspections of the rail
- Technology measurement (contact or non-contact) of track geometry
- Signal cabinet inspections and cleaning
- Radio tower cabinet inspections and cleaning
- Points motor inspection and cleaning
- Level crossing protection electrical and mechanical equipment

These items though are not new to the region and existing work teams would incorporate these activities in to their existing work schedule and/or be supplemented with additional resources. The introduction of field signal based RCS onto the Newlands section will require a restructuring and supplementation of the existing signalling teams.

It is apparent that little else needs to be done that is normally “steady state” for a railway of this type particularly as less than 20 million gross tonnes would have accumulated over the Regulatory Period. This tonnage is very minor in the life of a heavy haul railway as constructed. Tasks that would normally occur in a mature aged “steady state” railway include:

[8] The QCA has not been provided with the contracts, but the idea was not rejected at a meeting with Aurizon on 6th March 2013

[9] A road vehicle capable of using the railway

- Fence repair
- Level crossing replacement/repair
- Bridge maintenance
- Rail replacement
- Rail grinding
- Resurfacing (tamping)
- Vegetation control
- Access road maintenance
- Broken rail repair
- Signal lamp replacement (for signalled territory)
- Signal cable repair/bonding
- Points machine repair/replacement
- Radio repair
- Sleeper pad and clip adjustment
- Earthworks repair

Many of these items will be repair in the Defects Liability Period if issues arise.

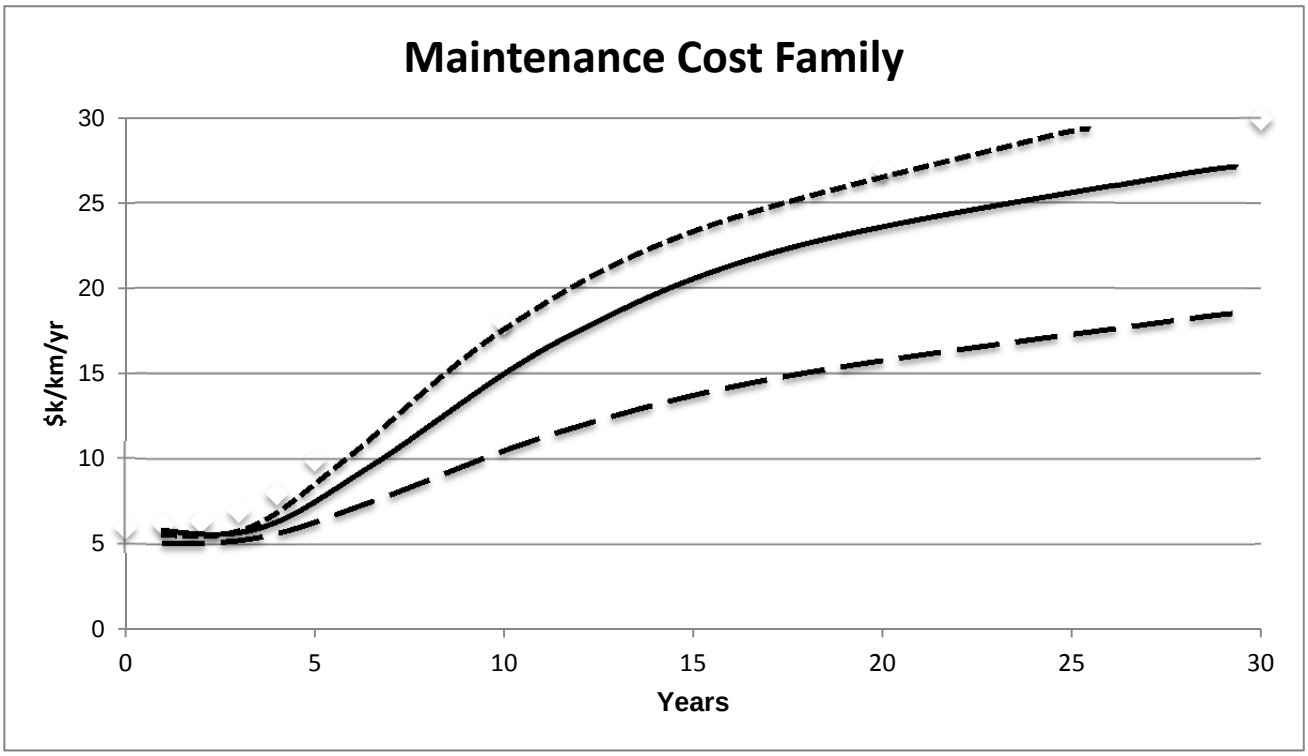
Of the list, vegetation control and access road maintenance are the only notable maintenance items but they are only a small fraction of the total maintenance effort required in a depreciated mature age system.

Figure 2 shows some typical temporal profiles of maintenance cost, the thickest line representing approximately 30 MGT[10] task. The dashed lines above and below represent higher and lower tonnages respectively. In the early life of the asset receives inspections and small amounts of corrective maintenance. At half life the asset experiences wear and tear requiring replacements and structural corrective maintenance such as with formations. At this stage a “steady state” is reached and the asset components are being replaced or subject to heavy repair on a cyclic basis.

No matter the task in the first few years, the majority of the work is inspection usually on a time driven basis. It is this region of the maintenance regime that is the subject of this review.

[10] Million Gross Tonnes, or about 20 Million Net Tonnes

Figure 2 Temporal Maintenance Cost Family Profiles



Benchmark Estimates

While caution always needs to be exercised with benchmarking a number of equivalent situations exist that could be brought to provide a boundary to the estimate.

A review of the Bauhinia Regional Rail Line conducted by WorleyParsons in 2005 for the QCA, used its own estimate, an estimate of the Hail Creek Line maintenance performed for the QCA in 2003 and the estimate methodology adopted by the Economic Regulation Authority of WA, to suggest appropriate maintenance estimates for the new railway.

Recognition was made of the BRRL configuration which was of a lighter construction and assumed a limited life to that of the Hail Creek Line.

In that report WorleyParsons states “For the first 5 years of the infrastructure’s life, it is expected that time driven inspection will dominate since the usage would not be great enough cumulatively to warrant replacements or major corrections”.

The data used from Hail Creek, ERA of WA and WorleyParsons’ own estimates conclude “All of these benchmarks point to an acceptable range of maintenance cost rates of a range between $7,000 per km to $10,000 per km per annum as being applicable to the BRRL”.

The tonnage profile predicted for GAPE is similar to that for Bauhinia at the time.

The configuration of Bauhinia was of a lesser standard than the current GAPE standard, particularly noting the use of 50kg/m rail instead of 60kg/m rail but the ramp of tonnages has been lower than expected.

The Esperance Line was used as the most severe comparison as the MEERA standard was for a 23 tonne axle load operation but the gross tonnage was higher. In addition, the Western Australian regime permits the calculation of maintenance on a discounted cash flow basis over the life of the asset but with the asset as being new in year 1. Therefore the early part of the life of the asset is not directly represented and the estimate is likely to be near to the discounted mid-life maintenance effort.

Nevertheless, in 2011/12 $, this benchmark analysis would point to a range of total maintenance cost of approximately $7,500 to $11,000 per km per year and this is recommended.

GAPE Circumstances

The GAPE infrastructure is a mixture of new track, new signalling systems, new turnouts, new passing loops as well as enhancements to existing track, and existing passing loops.

Where new track or signalling has been built, inspection costs would be demonstrably "new" in that extra effort has to be made to travel the extra distance or to the new facility. Where enhancements have been made to "brown fields" situations, the same inspection regime would apply to differently configured assets such as new rail, sleepers, ballast and bridges.

As such, to determine the extra costs brought on by the extra tonnage and to determine a reasonable maintenance costs (AT1 & AT3, AT4 combined) it is necessary to apply the estimated unit costs of maintenance to an appropriate length of track. The unit cost is on the basis of track kilometres. Thus duplicated track or passing loops are counted twice the route length, except that where existing track was not upgraded and remains just for empty trains, this amount would not be counted.

As the majority of the maintenance cost in this instance relates to inspections, the inspections of new facilities such as signalling, track such as rails and track geometry and bridges, the unit cost estimate should be applied to that infrastructure thus indicated.

The scope of the work included:

Goonyella System works amounting to approximately 6km of new track

Northern Missing Link works including 69km of single track and 3 by 1.4km passing loops

Newlands System works including 3 by 1.4 km passing loops, 5 kms, upgraded/duplicated track (including Kaili to Durroburra duplication and Briaba duplication, ignoring the existing track not upgraded) 172 kms, new unloading loop 6 kms and 2 new holding roads at Pring, 4 kms. Some of these locations included bridge works.

The total length to which the unit maintenance cost should be applied is therefore 186 kms.

The range of expected maintenance cost increase is therefore 187 * $7,500 to 187 * $11,000 per year. That is $1,402,500 to $2,057,000 per annum.

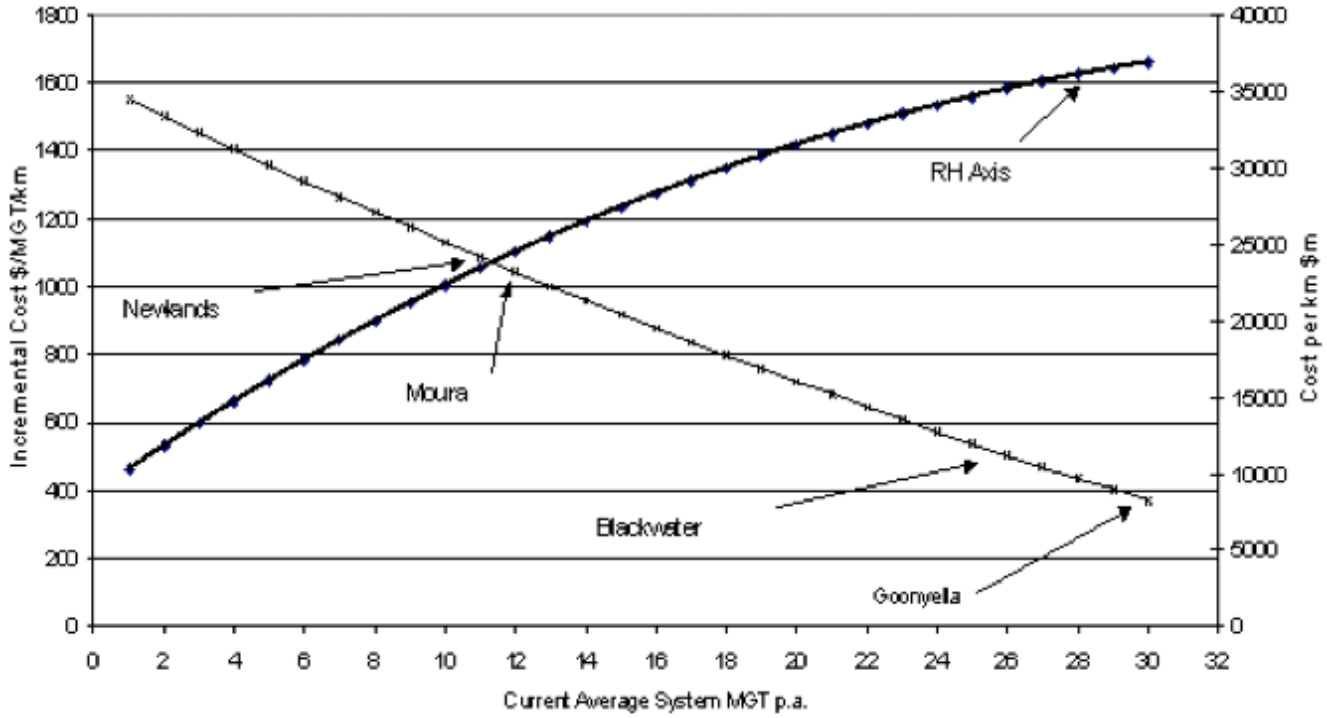
2.5 Calculation of AT1 for GAPE

In as much as the maintenance costs for GAPE are almost entirely those associated with inspection costs the application of the AT1 concept is different to its original intention, to indicate the cost of one extra tonne in a mature railway.

In the QCA's Draft Decision of QR's Draft Undertaking, December 2000, Working Paper 2 explains the rationale for incremental maintenance and is summarised in Figure 5.1 of that Working Paper and repeated in Figure 3 below.

Figure 3 Working Paper 2, Figure 5.1

Figure 5.1 Incremental Cost Functions for Infrastructure Maintenance Derived from Various Regressions of QR Data



Where most of the maintenance costs associated with a railway are "time driven inspection[11]", and none of the costs are associated with wear and tear, AT1 provides no insight into those incremental costs since there are no incremental costs associated with wear and tear. AT1 purpose is to acknowledge the slope of the maintenance cost curve with increasing tonnage.

Newlands and Moura in this diagram have the highest incremental cost (left hand axis) because there is a steeper impact on those systems for an extra tonne than for the Goonyella and Blackwater Systems. This is because their proportionate incremental wear and tear is higher.

Therefore it is suggested that AT1 be set at zero for the purposes of this Regulatory period and all maintenance costs recovered through the remaining AT3 & AT4 elements. AT2 will continue to remain.

[11] WorleyParsons "Review of the Bauhinia Regional Rail Line Costs, July 2005"

3 Operations Costs

3.1 Aurizon's Approach

Aurizon have referred to the UT3 Decision of the QCA and the work undertaken by GHD in relation to Operations Costs in a document called "Assessment of Operating and Maintenance Costs for UT3, September 2009" for that Decision.

In that report GHD estimated Operations Costs by reviewing each element of the costs and providing bottom up and benchmarked data comparisons. There was a high degree of agreement between the QR (as then) submission and that provided by way of analysis.

As noted in the current Aurizon submission, GHD provided an estimate of the difference in Operating Costs between a GAPE scenario and a non-GAPE scenario.

The table (Table 6) provided in the GHD document is repeated in Figure 4

Figure 4 GHD Table for Estimation of Operations Cost

Table 6 Recommended Operating Costs ($m, 2007/08)

1	2	3	4	5	6	7	8	9	10	11
Year	Regional (QR Proposed) Incl GAPE	Total System Wide (GHD Adjusted)	Total QR Network Allocated Specific (QR Proposed)	CQCR Allocated Specific (QR Proposed)	CQCR Standard Allocator (QR Proposed)	CQCR Allocated Standard (QR Proposed) (6)*(3-4)	Total Recom'd CQCR incl GAPE (2)+(5)+(7)-$1.88	Total Recom'd CQCR excl GAPE (8)*task ratio after 2009/10	Total Recom'd CQCR excl GAPE (New task) 99%*(9)	Total QR Proposed Excl GAPE
2007/08	$16.963	$75.561	$14.428	$7.732	40.0%	$24.453	$49.149	$49.149	$49.149	
2008/09	$19.957	$72.567	$14.816	$8.272	40.5%	$23.489	$50.155	$50.155	$50.155	
2009/10	$21.705	$70.819	$15.203	$8.812	40.5%	$22.524	$51.161	$51.161	$50.65	$54,493
2010/11	$22.951	$69.573	$15.203	$8.812	40.5%	$22.020	$51.903	$51.161	$50.65	$54,158
2011/12	$24.123	$68.401	$16.103	$9.597	46.0%	$24.057	$55.897	$52.501	$51.98	$56,197
2012/13	$25.317	$67.207	$16.103	$9.597	46.5%	$23.763	$56.797	$52.501	$51.98	$56,697

Aurizon suggests using the difference in cell 2011/12:8 and 2011/12:10 (55.897-51.98=3.917) and have rounded it to $3.80m in $2007/08. Similarly they have used the difference for 2012/13 (56.797-51.98=4.817) and rounded to $4.70. They have then escalated that amounts to $2011/12 to be consistent with the other estimates in the submission.

This is a reasonable approach as the various components of the Operating Costs were identified and benchmarked.

3.2 Discussion

Aurizon do however have some concerns about whether the estimates are reflective of the situation today because "these estimates were based on a more substantial tonnage profile than was used to determine the GAPE Reference Tariff" ..and as the "railway manager [was] responsible for the entire Queensland narrow gauge coal network.. the 40% standard allocator will materially underestimate the stand-alone costs now incurred".

3.2.1 Allocation Method

The allocation method was criticised in the GHD report because the potential for mis-allocation on the basis of rules that may not reflect the true nature of the costs over such a broad spectrum could easily distort the outcome. Now that Aurizon does not need to contend with City Train and other QR business one could expect better definition of direct costs. The allocation of remaining common costs will be a higher percentage but presumably of a much smaller amount. The passenger business of City Train and general freight must have had an overwhelming burden on the corporate resources of the old QR compared to running a coal network.

3.2.2 Tonnage Profile

In relation to "more substantial tonnage profile", GHD observed in its Figure 17, Operations Cost Drivers Index, that there appeared to be insensitivity to train paths and tonnage and this was not fully explored except that the Allocative approach of many of the costs would no doubt reduce sensitivity to these factors.

3.2.3 Cross-check

Aurizon also performed a "cross-check" and a "high level assessment was carried out to identify the necessary functions that would be affected by the introduction of GAPE traffic during the ramp-up period. These functions include:

- A new Train Control board and the required network controllers and managers to operate it;
- Additional planning and incident response staff; and
- Other contract management and administrative staff. "[12]

No doubt, the extra traffic and new network lengths will create increased activity. The capacity to deal with this activity is incrementally stepped in that the addition of staff occurs in whole numbers and office space similarly. Some costs are fixed between large steps in capacity such as in IT systems.

The ability to aggregate these functions and enjoy economies of scale would be beneficial and while a new GAPE System has been created out of Commercial

[12] Aurizon's Draft Amending Access Undertaking Reference Tariff for the GAPE System

considerations, as with maintenance, it is hoped that the actual operations will make use of the combined resources of the integrated CQCR.

The Aurizon approach to Operations Costs is appropriate.