Queensland Competition Authority

Report for QR Network Access Undertaking

Assessment of Operating and Maintenance Costs for UT3

September 2009

Contents

Table Index

Figure Index

Appendices

1. Introduction

The following report is an assessment of QR Network's forecast operating and maintenance costs in the Central Queensland Coal Region (CQCR). The forecast costs apply to the UT3 regulatory period (2009/10 to 2012/13) and relate to below rail activities/infrastructure for coal only traffic.

This report has been commissioned by the Queensland Competition Authority (QCA) to assist in its determination of QR's network access undertaking for UT3.

The three principal tasks of the report are to:

- assess the reasonableness and efficiency of QR Network's forecast *operating* costs;
- assess the reasonableness and efficiency of QR Network's forecast *maintenance* costs; and
- assess the reasonableness of QR Network's forecast *incremental maintenance reference tariff* component;

This report relies upon a number of documents and information sources, including QR Network's UT3 submission, information on QR Network's system characteristics, historical data relating to QR Network's maintenance and operating expenditures, as well as data from other comparable rail infrastructure operators. All the information referenced by this report is publicly available.

The report compares and contrasts QR Network's costs with those of similar heavy haul infrastructure operators, and the individual coal systems that make up the CQCR. Included in the report is a sensibility check and a comment on the reports included QR Network's UT3 submission.

The analysis in this report aims to better inform the QCA in relation to the reasonableness of QR Network's costs and to assist the QCA come to a position over the reasonableness of QR's proposed access tariff. All analysis in this report has been made on the basis of 2007/2008 (June 2008) costs. It has been necessary in some instances to escalate historical costs. QR has supplied some costs in 07/08 terms, but the majority of the documentation supplied indicates costs in nominal terms. Some assumptions have been made where individual activity costs have not been available in constant dollar terms.

1.1 Terms of Reference

The terms of reference for this assessment are contained in Appendix A of this report.

1.2 Deliverables

QCA has requested the preparation of a report suitable for public review responding specifically to the questions raised in the terms of reference. The report is to make assessment and provide comment where necessary.

1.3 Reference Material

In compiling the report we have made reference to the following documents:

- 'WestNet Rail's Floor and Ceiling Costs Review – Final Determination on the Proposed Floor and Ceiling Costs'. Economic Regulation Authority June 2007

- 'Floor and Ceiling Costs to Apply to WestNet Rail' – Determination of the Western Australian Independent Rail Access Regulator. Office of the Rail Access Regulator 24 September 2003
- 'WestNet Rail – Rail Network Pricing Model – Public'. Economic Regulation Authority Oct 08
- 'Proposed Floor and Ceiling Costs for Mainline, Worsley line and terminal End Bits'. WestNet Rail August 08
- ARTC Annual Report 2008
- '2006-07 Submission to the Independent Pricing and Regulatory Tribunal in Respect of Hunter Valley Regulatory Network – Roll Forward Asset Base Ceiling Test Under & Overs Account' ARTC. Oct 2007
- '2006-07 Unit Cost Performance Indicators'. ARTC Dec 2008
- 'Independent Internal Audit of Performance Indicators - Access Undertaking 1 May 2002'. ARTC May 2008
- '2006-2007 Submission to the Independent Pricing and Regulatory Tribunal in respect of Hunter Valley Regulatory Network' ARTC October 2007
- 'Links No.14 November 2006'. ARTC
- 'Hunter Valley Corridor 2007–2012 Capacity Strategy Consultation Document' ARTC. 29 November 2007
- 'The Australian Black Coal Industry Inquiry report – Volume 1: Report' - Productivity Commission 3 July 1998
- - 'QR Network's Access Undertaking (2009) - Maintenance Costs'. QR Network. August 2008.
  - 'QR Network's Access Undertaking (2009) – System Wide and Regional Costs'. QR Network. August 2008.
  - 'QR Network's Access Undertaking (2009) – Volume 2. Central Queensland Coal Region Reference Tariffs'. QR Network. September 2008.
  - Further Unescalated Cost Advice, spreadsheet provided by QR detailing the 2007/08 $ (real costs) and the relevant Nominal costs
  (For this report these 4 documents are called "QR's Submission")
- UT3 supplementary information – Response to S.185 notice to Produce Dated 14 October 2008' QR Network November 2008 (For this report called "Response 1")
- UT3 supplementary information - Response to Queensland Competition Authority's Notice to Produce Information by 20 March 2009, UT3 Operating and Maintenance Costs, Date: 20 / 03 / 2009 (For this report called "Response 2")

During June 2009 QR submitted altered (lower) tonnage forecasts, particularly affecting 2009/2010 projections with minor alterations (lower) for subsequent years. No alteration in operating or maintenance costs was submitted.

In addition, in June 2009 QR clarified that the detailed activity based costs included in the maintenance cost projections were made on the basis of tonnages including GAPE. Both GAPE and non-GAPE maintenance costs on an accumulated basis were available in $07/08 and we subsequently assumed that the activity costs for the non-GAPE scenario are proportionately affected. This reference is referred

to in this report as UT3MCS[1]. Our analysis of the activity related maintenance costs is therefore based on those modified costs and the analysis is on the GAPE exclusive task.

No such alterations have been made to Operating costs since all of QR's detailed operations costing relates to GAPE inclusive tasks. Operations cost analysis has therefore been made on the basis of GAPE inclusive tasks and this has been necessary because as 40%-50% of the Operations cost is allocated cost it was not possible to pro-rata these costs for a non-GAPE task.

Our advice from QR in June 2009 regarding task, is shown in Table 1. In order to carry out benchmarking we have maintained consistent Tonne to GTK[2] and Train Path ratios with the original data. We note that slightly different data has been provided by QR in its various documents relating to task but that the data in Table 1 has been our base.

Table 1 QR's Updated June 2009 Task Excl GAPE

Original volumes Excl GAPE (net tonnes)			**Year 1 2009/2010**	**Year 2 2010/2011**	**Year 3 2011/2012**	**Year 4 2012/2013**
Blackwater	Blackwater	b	48,165,000	48,165,000	48,165,000	48,165,000
Blackwater	stanwell	s	3,500,000	3,500,000	3,500,000	3,500,000
Rolleston	South West Blackwater	swb	9,042,500	9,042,500	9,042,500	9,042,500
Minerva	Minverva	mb	2,375,000	2,375,000	2,375,000	2,375,000
vermont	vermont	v	1,900,000	1,900,000	1,900,000	1,900,000
Blackwater TOTAL			**64,982,500**	**64,982,500**	**64,982,500**	**64,982,500**
Goonyella	Goonyella	g	119,631,459	123,405,000	122,455,000	121,505,000
gvg	GVG	gvg	1,141,041	1,140,000	2,090,000	3,040,000
Goonyella TOTAL			**120,772,500**	**124,545,000**	**124,545,000**	**124,545,000**
Moura	Moura	m	16,440,000	16,440,000	16,440,000	16,440,000
Newlands	Newlands	n	18,620,000	18,620,000	24,500,000	24,500,000
Total			220,815,000	224,587,500	230,467,500	230,467,500
			220,815,000	224,587,500	230,467,500	230,467,500
Revised Volumes Excl GAPE as at 10 June 2009						
Blackwater			56,900,000	63,500,000	64,982,500	64,982,500
Goonyella			92,840,000	117,240,000	124,545,000	124,545,000
Moura			13,440,000	16,440,000	16,440,000	16,440,000
Newlands			14,740,000	17,500,000	19,500,000	19,500,000
Total			177,920,000	214,680,000	225,467,500	225,467,500

[1] UT3 Maintenance Cost Summary where constant $07/08 and nominal costs are shown in a spreadsheet

[2] GTK or gtk, gross tonne kilometres

2. Background

2.1 QR Access Undertaking

Rail infrastructure in Queensland is owned and managed by QR Network. Since 1998, QR's rail network has been subject to an open access regime, which allows parties to access Queensland's rail network in the central coal region to operate rail services.

Every four or five years QR Network enters into an access undertaking that provides a framework for operators seeking access to the rail network. The undertaking sets out QR Network's obligations in a number of areas including: pricing principles, access negotiations, ring-fencing arrangements, development of access agreements, network capacity, interface arrangements; and QR Network's reporting.

The Queensland Competition Authority (QCA) regulates rail access in Queensland to ensure that third party access seekers and consumers of rail services are charged a fair access price by QR and that QR is adequately reimbursed for that service.

As part of its obligation under the act, QR Network is required to demonstrate efficient costs with respect to its capital and maintenance expenditure.

Access tariffs are determined in large part by QR Network's maintenance and capital expenditure and operating cost. Thus determining the reasonableness of QR Network's costs will enable the QCA to come to a position over the reasonableness of the access tariff.

The first access undertaking (UT1) commenced in 2001 and covered the 5-year period to 2005. QCA's approach in assessing QR Network's costs for UT1 was based on a bottom up evaluation of maintenance and operating costs. It assumed an efficient stand-alone infrastructure provider serving only coal traffic.

QCA's assessment of QR Network's second access undertaking (UT2) between 2005 and 2008 built on the first undertaking assessment, adjusting factors and allocations previously adopted but not fundamentally altering the approach.

Since UT1, QR Network has undergone a greater degree of separation and ring-fencing of its activities. While some costs, such as shared organisational costs, are not directly attributable to maintenance and operation of the coal network, many of QR Network's costs are now directly attributable.

2.2 Central Queensland Coal Region Rail Network

The Central Queensland Coal Region (CQCR) rail network is a network of over 1,600 route track kilometres linking coal mines in the Bowen basin to coal ports at Mackay and Gladstone. The Bowen basin lies south west of Bowen and west of Mackay, Rockhampton and Gladstone as shown in Figure 1 below:

Figure 1 Central Queensland Coal Region and Rail Network

Coal from the CQCR is mostly bound for export to serve the overseas coking coal and thermal coal markets.

The CQCR is made up four rail systems:

- the Moura system which serves coal mines west of Gladstone in the Dawson and Callide Valleys. The system provides connection to the port of Gladstone;

- the Blackwater system which serves mines in the central Queensland coal fields west of Rockhampton;
- the Goonyella system which links mines in the Bowen Basin to ports near Mackay (Hay Point and Dalrymple Bay) and to other ports through its connection with the North Coast line; and
- the Newlands system which serves mines north of the Bowen basin providing connection to the port at Abbott point.

The majority of the network has been in operation for the last 15 years, and has been steadily expanding to meet the growing demand for export coal. Two further major capital expansions are planned:

- a 68 km rail link between North Goonyella and Newlands which will connect the Goonyella and Newlands systems (the Northern Missing Link); and
- the Surat basin railway between Wandoan and Banana which will connect coal reserves west of Toowoomba with the port of Gladstone via the Moura system.

Figure 2 below shows the relative size of the CQCR coal systems.

Figure 2 Relative Size of the Coal Region by Coal System

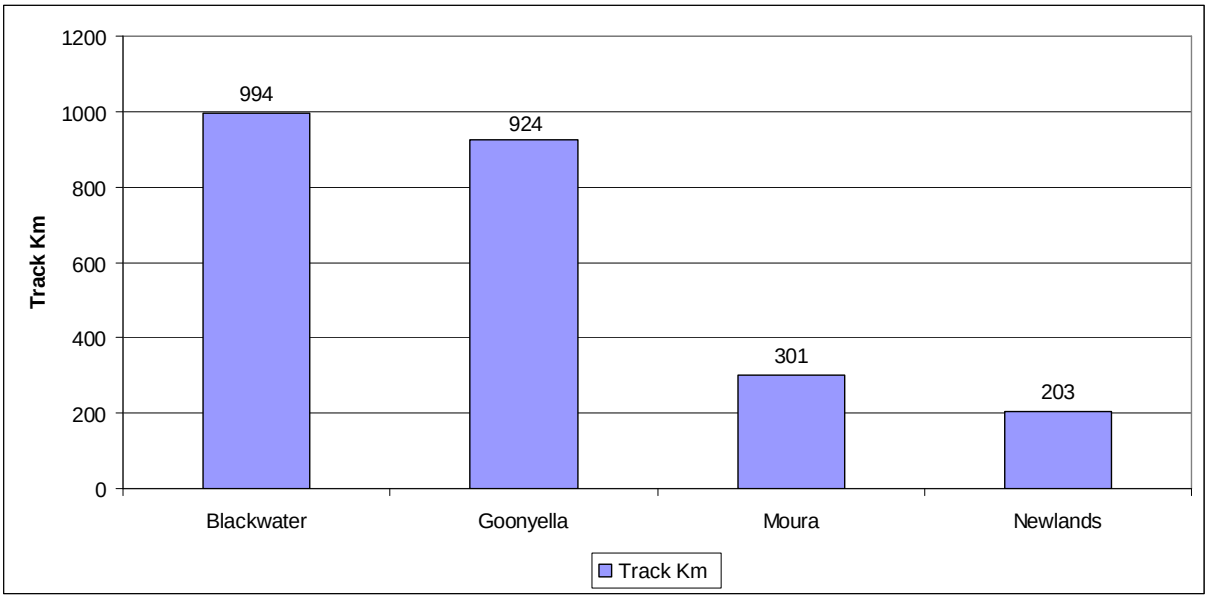
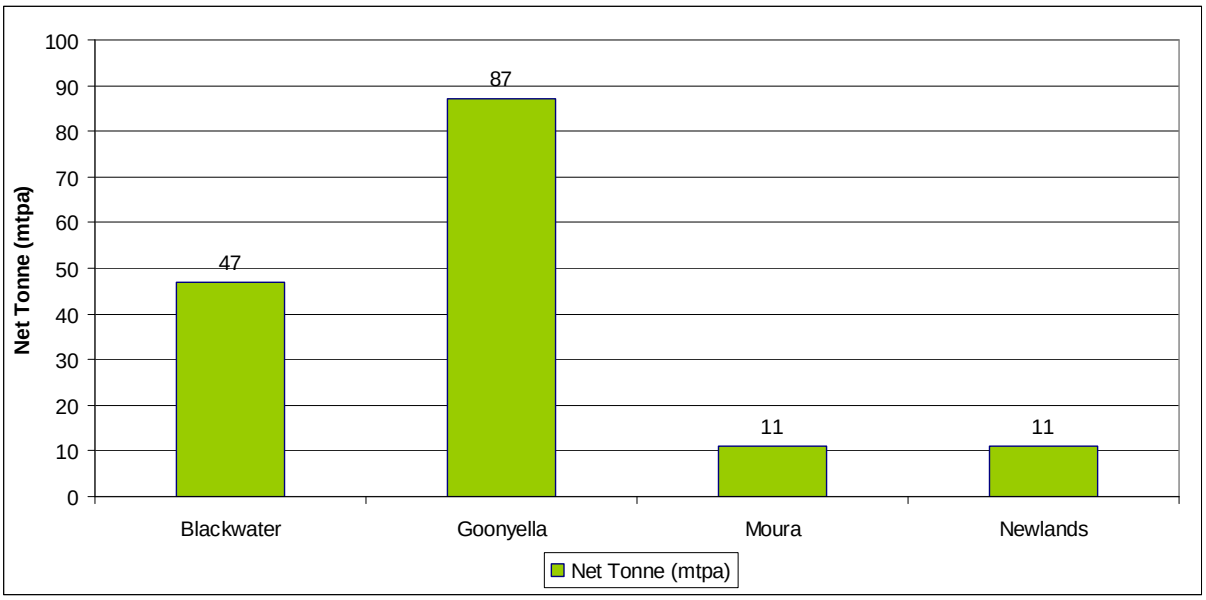


Figure 3 below shows the net tonnages hauled in each of the CQCR coal systems in 2007/08.

Figure 3 Net Tonnages Hauled in the Coal Region by Coal System (2007/08)



2.2.1 Moura system

The Moura system is a non-electrified single line with several passing loops. Part of the system overlaps with the Blackwater system that is electrified near Gladstone. The Moura system has a track length of around 301 km. In 2007/08 11.6 million tonnes of coal were hauled in the system.

The Moura line has been in operation for many decades and was originally built as a lightly trafficked line with timber sleepers and 47kg/m rail. In 1996 the line was upgraded with 60kg/m rail and concrete sleepers. Apart from coal, the Moura line carries some grain, livestock, and general freight, although proportionally this other traffic represents a small percentage (less than 10%).

Expansive clays have led to some formation instability with ensuing problems in track geometry especially during wet and dry seasons. There have been attempts in the past to stabilise the formation with lime injection techniques, with variable success.

Since its upgrade, the Moura line is considered to be in good condition.

2.2.2 Blackwater system

The Blackwater system comprises electrified double and single track as well as some non-electrified lines. Many of its branch lines came into existence in the late 1960's and early 1970's,

The line to Blackwater was built as a lightly trafficked line in 1877. For the most part, the line follows its original alignment, though in the intervening years the track has been significantly upgraded.

Most of the bridges have been upgraded to 30 tonne axle load capacity. Cuttings and embankments have been widened in clay/shale areas and lime stabilisation of the track formation has been carried out in selected areas. In 1997 and 1998 most of the timber sleepers were replaced with concrete sleepers and the light weight rail upgraded with 60kg/m rail. Other improvements include upgrading of turnouts with concrete bearers and swing nose crossings to improve track reliability.

While the main line is of a good standard, not all the tracks on the Blackwater system are similar or to a consistent standard. Several branch lines and balloon loops which carry appreciable tonnages are not at the higher standard of concrete sleepers and 60kg/m rail. Generally, the Blackwater system is in good condition though, like the rest of the coal network, ballast contamination is a major issue. Considerable effort is being channelled into ballast cleaning.

2.2.3 Goonyella System

The Goonyella System comprises electrified bi-directional double track and single line sections. There are no non-electrified sections. The main line between Goonyella and Hay Point came into existence in 1971. Branch lines and expansions (to German Creek, Blair Athol and Riverside) plus duplication of the main line between Hay Point and Coppabella followed in the 1980s. At that time the track was upgraded with 22.5 tonne concrete sleepers and 53kg/m rail. Rail replacement is proceeding in 60kg/m. Some of the concrete sleepers are nearing the end of their of serviceable life with significant corrosion in the sleeper fixings.

Formation problems have been a continuing problem since the track's construction and are exacerbated by severe ballast fouling and highly expansive clays in some areas.

2.2.4 Newlands system

The Newlands System is a non-electrified single line at the northern end of the Bowen Basin

The section of line between Collinsville and Bowen has been operating as a coal line since 1922. The line section between Collinsville and Newlands was constructed in 1983. At that time the system saw a significant increase in tonnage. Upgrading of the older part of the line with 53kg/m rail and 22.5 tonne concrete sleepers took place when the system was expanded in the 1980s.

The track is located on variable geological conditions which is manifest in poor track geometry and problems with rail wear. The track is considered to be in a good condition, particularly given the relatively low tonnages involved.

2.2.5 Train Control

Train control in the CQCR consists of a modern system controlled remotely from control centres at Mackay and at Rockhampton. The Mackay control centre manages coal traffic on the Newlands and Goonyella systems. The Rockhampton control centre manages coal traffic on the Moura and Blackwater systems plus other freight and passenger traffic. In recent years, train control has seen more segregation in above and below rail activities and greater management intensity. Support for train control activities, especially responding to changing supply chain requirements, has increased significantly as coal demand has increased and this has been reflected in QR's cost base for operations cost.

3. High Level Review of QR Network's Operating Costs

3.1 Introduction

The following section consists of a high level review of QR Network's forecast operating costs for the UT3 period on a GAPE inclusive basis. The review involves benchmarking QR Network's operations with those of similar below-rail infrastructure operators and comparing QR Network's current and future operating costs at a regional and system level.

All material referenced in this section is publicly available and includes data from the following sources: public documents relating to other below-rail infrastructure operations; QR Network's UT3 submission and historical data from earlier undertakings.

Part of this assessment is a review of a report by Booz and Co. ('Booz') which was commissioned by QR Network to support the reasonableness of UT3's forecast operating costs.

3.2 Definition

For the purposes of this report the definition of operating costs and their categories are those adopted in UT1 and UT2, as follows:

- train control (including safe working and operations administration);
- infrastructure management (including telecommunications, engineering, R&D);
- business management (including regulation and policy, master planning, new business, major projects); and
- overheads (including business support, IT, HR, management, shared services, corporate overheads, and capital works and studies).

QR Network has identified several new cost items compared with previous undertakings. They are listed in a category entitled 'Network Access Business Support/ Finance/ Overheads'. For the purposes of comparison and consistency in analysis, these items have been amalgamated with the Business Management cost category.

All costs in this analysis are in 2007/08 terms and all task is in terms including the GAPE[3] project, the proposed track capital works that will link the Goonyella and Newlands systems and lead to large increase in tonnage, particularly on the Newlands system.

3.3 Benchmarking with Below Rail Infrastructure Operators

Benchmarking is a useful exercise but it has its limitations. Accurate comparisons between below rail infrastructure operators are difficult to make because of differences in operational and system characteristics. These differences typically include commodity, haul distance, type and mix of traffic, traffic density, system complexity, train control systems, rail electrification and other system peculiarities. Without knowing with certainty how rail infrastructure owners organise their costs, and with the scarcity of publicly available information to confirm this, benchmarking should be treated more as indicative rather than a means of accurate comparison. Nevertheless, benchmarking is useful as a sensibility check.

[3] The QR documentation refers to both GAEP and GAPE as acronyms for the project. This report uses GAPE.

3.3.1 Comment on Booz Report

QR Network engaged Booz to review and comment on the reasonableness of its forecast operating costs. Booz's assessment involved benchmarking QR Network with ARTC and several other infrastructure operators.

The main findings of the Booz analysis are that QR Network's forecasts are efficient in the areas of train control and business management (compared to ARTC's operations in the Hunter Valley) and overhead allocations and efficiency targets are appropriate and economical compared with other industry comparators.

Generally, the Booz approach is sound and the conclusions it draws appear reasonable. There are, however several aspects in the Booz report that require clarifying comments, not because they are fundamentally wrong, but because certain assumptions can be misdirected and with alteration point to slightly, though not essentially, different conclusions. In essence, these clarifying comments amend the apparent extent of QR Network's efficiency.

Firstly, the Booz assessment in the area of train control, and business and infrastructure management relies solely on ARTC's operations for comparison. Though not incorrect (ARTC's operations are highly comparable), this reliance on a single operator limits the report's completeness. A larger sample would draw a firmer conclusion with respect to QR Network's actual efficiency, rather than its relative efficiency. This is especially the case of train control, with its many variables that affect cost such as technology, traffic mix and traffic density.

Train Control

Comparing train control, ARTC's Hunter Valley operations are more complex in terms of traffic density, path and traffic mix; haul lengths are also shorter; for instance, in the Hunter Valley, train frequencies are around 27 minutes compared with Goonyella's 30 minutes. There are 50 trains per day in the Hunter Valley compared with 40 trains per day in Goonyella. About 60% of the traffic operating in the Hunter Valley are coal trains compared with 96% in Goonyella; so on a unit basis train control costs could be expected to be higher. The Booz finding of lower train control costs in the CQCR is thus a confirmation of an expectation rather than evidence of QR Network's actual efficiency in this area.

There are two further comments in relation to the Booz analysis regarding train control - the first is the Booz comparison of staff to train path ratios and its assumption of a direct relation between these two numbers. The analysis uses this ratio as a measure of efficiency. Booz finds that, compared with QR Network, ARTC requires a larger number of staff to manage a smaller number of train paths. In some circumstances a direct relationship between the number of train control staff and the size of the train control task may exist but the relationship varies with operation size. As systems approach an economy of scale, ratios involving staff numbers vary at a changing non-linear rate. So the Booz conclusion points to a level of efficiency which may not really exist. The second comment relates to the Booz assumption over the number of train control staff dedicated to coal trains. Compared with the CQCR, the Hunter valley carries a greater mix of traffic plus significant passenger traffic and thus its train control covers a larger amount of non-coal traffic. If adjustment were made for this extra traffic, ARTC's and QR Network's costs would be much closer - the overwhelming efficiency in QR Network's operations would not be evident.

Infrastructure Management

[redacted]

Business Management

The Booz analysis and conclusion appear reasonable with respect to business management costs. Interestingly though, Booz makes the comment that QR Network is subject to greater regulatory control and greater regulatory cost than ARTC. It cites QR Network's above and below rail accreditation requirements as the reason. This raises a concern as QR Network's business management costs should relate only to below rail operations. It is not clear from the documentation what the exact nature of QR Network's compliance costs are or whether they specifically exclude above rail components.

Corporate Costs

In the area of corporate cost allocations, Booz compares QR Network's forecasts to those of other national and international rail organisations and finds the forecasts to be reasonable or lower.

Given the variability in the way different organisations classify overhead costs, this kind of broad comparison should be treated as a rudimentary indicator only. Other organisations, for instance may include many of the activities categorised as business management, shared services, business support, or finance as part of corporate overheads. If this were so, it would substantially alter QR Network's apparent efficiency.

From the documentation provided, QR Network currently allocates around 40% of its total corporate overhead costs to the CQCR. QR Network is forecasting this ratio to rise over the course of UT3 and to reach 46.5% by the final year. In its report, Booz notes that this forecast increase is a reflection of the growth in coal freight traffic. While the exact derivation of this allocation is not outlined in QR Network's submission, it states that "the allocation is made in a manner consistent with the costing manual, that is, as a 'mark up' on operating costs excluding fuel, energy and depreciation". [redacted]

To provide a more complete benchmarking exercise, it is necessary to broaden the sample of heavy haul rail infrastructure operators. The two most relevant and comparable rail infrastructure operators in Australia are WestNet Rail (WestNet) and ARTC. Like ARTC, WestNet is separated from above rail operations and a large proportion of its freight is bulk haulage. Importantly, information relating to its operations is available and reliable. Our investigation of other overseas below rail infrastructure providers shows that there is little reliable or robust information on which to draw conclusions. We therefore conclude that the most appropriate comparators are ARTC and WestNet.

3.3.2 WestNet Rail

WestNet Rail (WestNet) manages over 5,100 kilometres of rail track and is the principal provider of below rail freight infrastructure in Western Australia. In 2007, WestNet carried around 21 billion gross tonne kilometres (GTK) across its network. Almost 90 percent of the freight hauled is destined for one of six ports. WestNet serves the regional areas of Western Australia which have economies based heavily in mining and agriculture. Most of WestNet's freight, on a tonnage basis, consists of iron ore though compared with the CQCR, it carries a larger mix of freight.

Like the CQCR in Queensland, WestNet's network is subject to an open access regime which is regulated by the Economic Regulation Authority of Western Australia (ERA). While the entire network is regulated only four lines which are considered likely contestable lines are chosen by the regulator for examination. There are the Eastern Goldfields Railway between Forrestfield and Kalgoorlie (EGR); the line between Leonora and Kalgoorlie (Leonora); the line between Kalgoorlie and Esperance (Esperance); and Kwinana and Bunbury Inner Harbour (SWM).

In its determination of WestNet's price regime in 2006, the ERA set a ceiling price for WestNet's operating and overhead costs. These costs, escalated to June 2008 dollars, are shown below in Table 2. QR Network's actual 2006/07 and forecast 2009/10 costs are included for reference.

Table 2 WestNet Unit Operating Costs

	WestNet 07/08	QR 06/07*+	QR 09/10$
Operating Cost ($'000) (June 2008$)	22,499[4]	36,208	54,493
MGTK	20,880[5]	62,205	67,864
Operating Cost ($) / MGTK	$1,078	$582	$803

* Costs have been escalated to June 2008 dollars
\+ 06/07 costs are the most recent actual costs available
$ Proposed in $07/08

As far as is possible the same categories of costs have been used in the operating costs for WestNet and QR Network. The figures show that QR Network's operating costs are lower on a GTK basis compared with WestNet's. This result is expected given the relatively uniform and concentrated nature of QR's freight task. WestNet has a greater mix of traffic and thus a greater degree of variability in traffic patterns and intensity.

3.3.3 ARTC

ARTC is the principal provider of below rail freight infrastructure for the national standard gauge rail network which includes the Hunter Valley coal network in New South Wales. The network is regulated by the ACCC. ARTC is a good comparator, particularly in its coal network because of the similarity of the transportation task.

The standard gauge rail network is over 10,000 kilometres long and links Kalgoorlie in Western Australia, Adelaide, Wolseley and Crystal Brook in South Australia, Broken Hill and Cootamundra in New South Wales, Melbourne and Wodonga in Victoria, and the line section up to the Queensland border via Albury, Macarthur and Newcastle.

[4] Source: 'Proposed Floor and Ceiling Costs for Mainline, Worsley line and terminal End Bits'. WestNet. Aug 08
[5] Source: 'WestNet Rail – Rail Network Pricing Model – Public'. Economic Regulation Authority. Oct 08

ARTC's operations can be divided into two quite distinct freight tasks – the Hunter Valley, which is a high volume, short haul coal operation and the rest of ARTC which is mainly long haul, containerised freight and other bulk commodities. In 2007/08 ARTC carried over 77 billion gross tonne kilometres across the standard gauge network, of which 16 billion gross tonne kilometres was coal in the Hunter Valley region.

For the purpose of comparison, ARTC's coal operation is the most similar to QR Network's both in scale and commodity. The rest of ARTC's operations, although not really a good comparator, will be included for reference along with WestNet's figures.

ARTC's operating costs in June 2008 dollars are shown below in Table 3. The costs are expressed as a ratio of train-kilometres. In 2007, the ACCC approved ARTC's access undertaking for the Interstate rail network which excluded the Hunter Valley. The value in Table 3 which relates to the non-coal network is the regulator's approved value.

Table 3 ARTC Unit Operating Costs and QR Comparison

	WestNet 02/03*	QR 09/10*	ARTC Hunter Valley Coal 06/07*	ARTC Non Coal 06/07*
Operating Cost ($'000)(June 2008$)	15,630[6]	54,493	13,993[7]	-
Train Km ('000)	7,506[3]	10,889	3,074[8]	-
Operating Cost ($)/Train Km ('000)	$2,082	$5,004	$4,552	$411[9]

* Costs have been escalated to June 2008 dollars

3.3.4 Discussion

Figure 4 shows the relative operating costs for each of the below rail infrastructure operators expressed in dollars per train-kilometre. Also included are the operating costs for each of CQCR's coal systems.

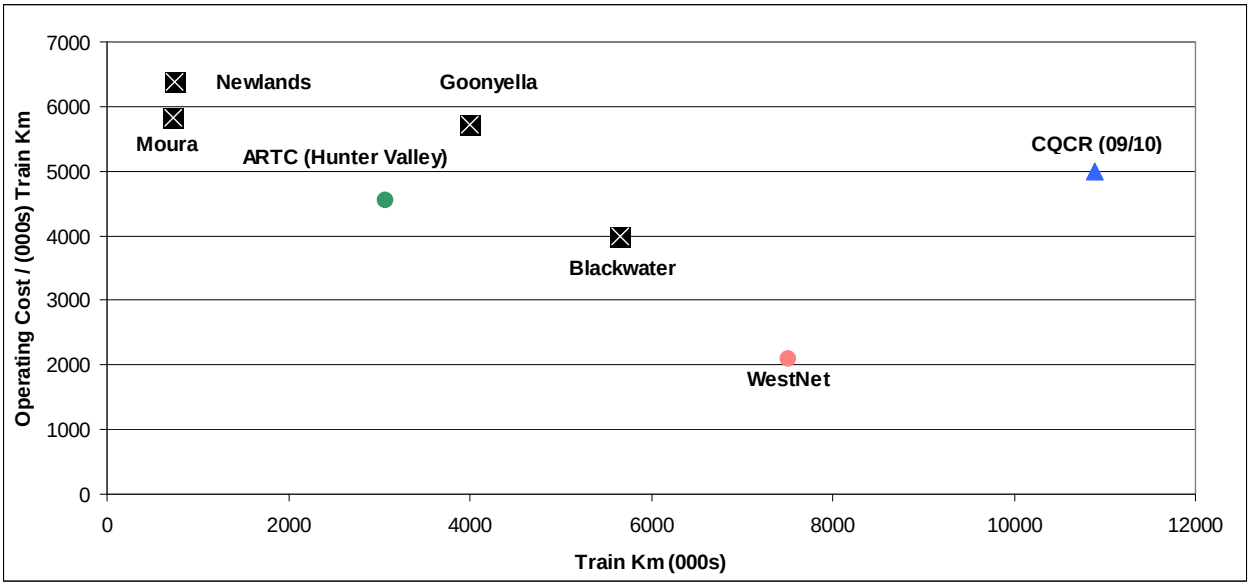
[6] *Source*: 'Floor and Ceiling Costs to Apply to WestNet Rail' – Determination of the Western Australian Independent Rail Access Regulator. Office of the Rail Access Regulator. 24 September 2003.

[7] *Source:* 'Independent Internal Audit of Performance Indicators - Access Undertaking 1 May 2002'. ARTC. May 2008.

[8] Figure derived from average haul distance and total train numbers. *Source*: 'The Australian Black Coal Industry Inquiry report – Volume 1: Report' - Productivity Commission 3 July 1998' and 'Hunter Valley Corridor 2007–2012 Capacity Strategy Consultation Document' ARTC. 29 November 2007

[9] *Source*: '2006-07 Unit Cost Performance Indicators' ARTC. Dec 2008

Figure 4 Operating Costs of Below Rail Infrastructure Operators ($ per Train Km)



The CQCR's unit operating cost sits between those of ARTC's Hunter Valley's and WestNet's. (CQCR's cost is the weighted average of its individual coal systems). On a benchmarking basis because of the longer distances travelled by ARTC's non-coal and WestNet's trains, their unit costs are expected to be lower (as is evident). ARTC's Hunter Valley operations are quite concentrated by comparison and thus costs per train-kilometre are expected to be higher. Allowing for differences in the way operating costs are classified between operators, the figures reveal a level of consistency across the organisations. CQCR appears to be comparable if not more efficient than ARTC's Hunter Valley operation.

3.3.5 Summary

On the basis of the comparisons outlined above, QR Network's operating costs appear reasonable in the context of the publicly available information, notwithstanding the foregoing comments about the limitations of benchmarking.

3.4 Comparison of Current and Forecast Operating Costs at a Regional Level

The following assessment compares QR Network's current and future operating costs at a regional level. It aims to assess the reasonableness of QR Network's costs by examining the relationship between traffic growth, other cost drivers and operating cost. The review checks for anomalies and agreement between years.

Figure 5 shows the actual and forecast net annual tonnages over the three undertaking periods. Actual data is unavailable for the 2008/09 year, so for this year, the historical forecast has been used. At the time of writing the actual task is expected to be lower than the forecast. The figures show that QR Network is forecasting a 25.8% increase in net tonnage between the final year of UT2 (2008/09) and the final year of UT3 (2012/13), including GAPE.

Figure 5 Actual and Forecast Net Tonnages for the Coal Region (Incl GAPE)

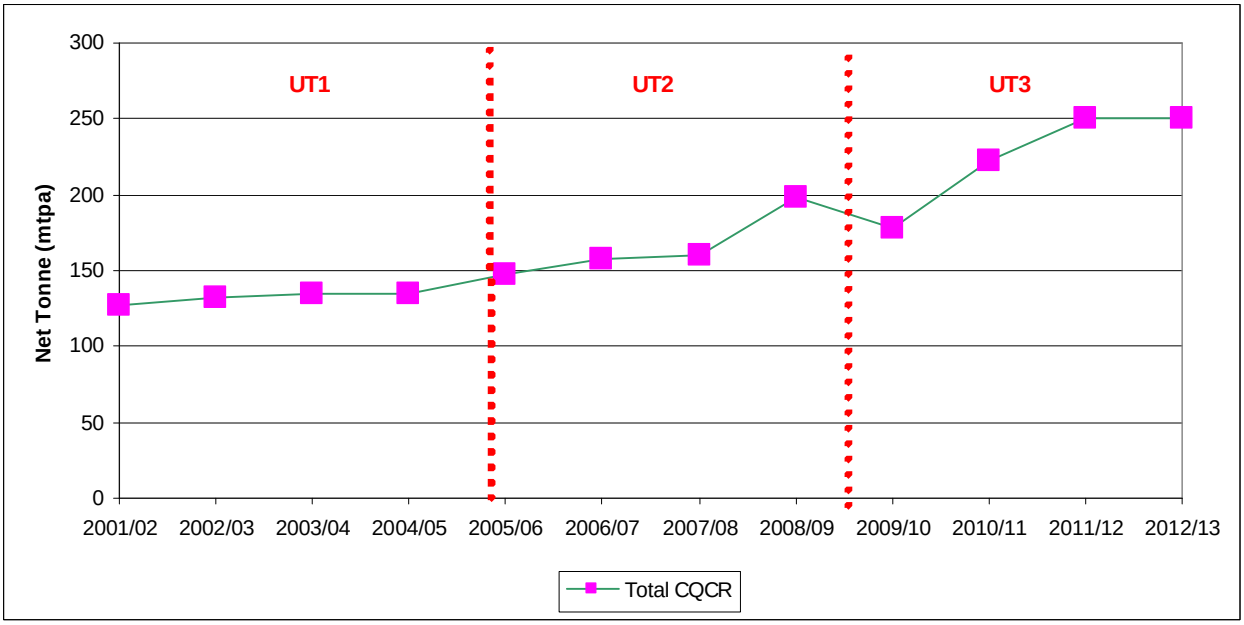
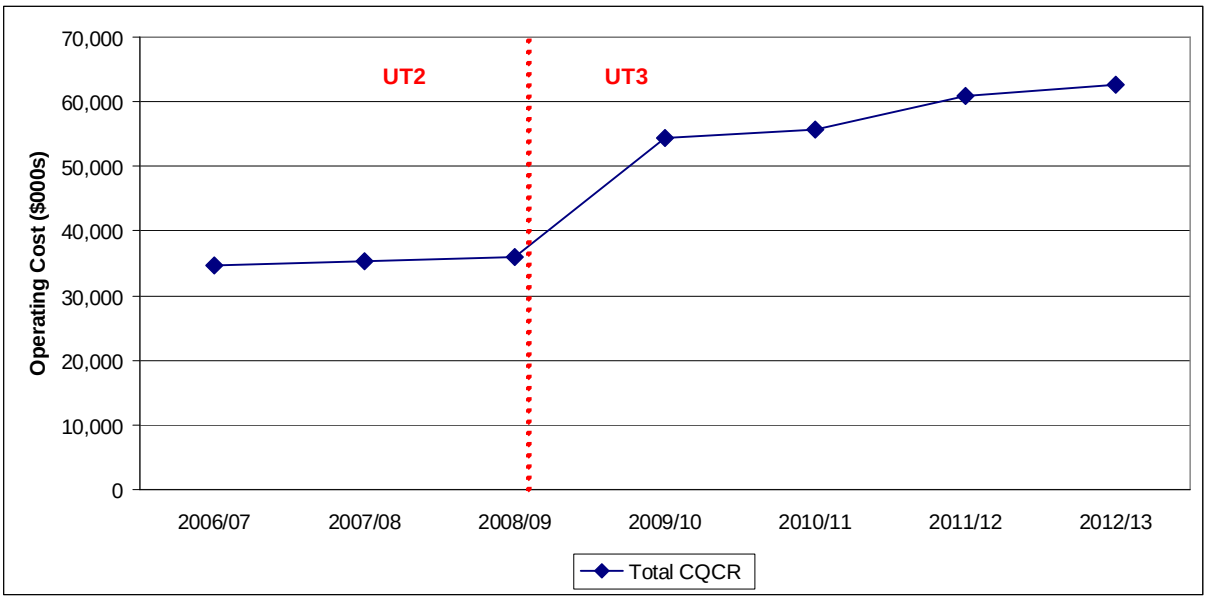


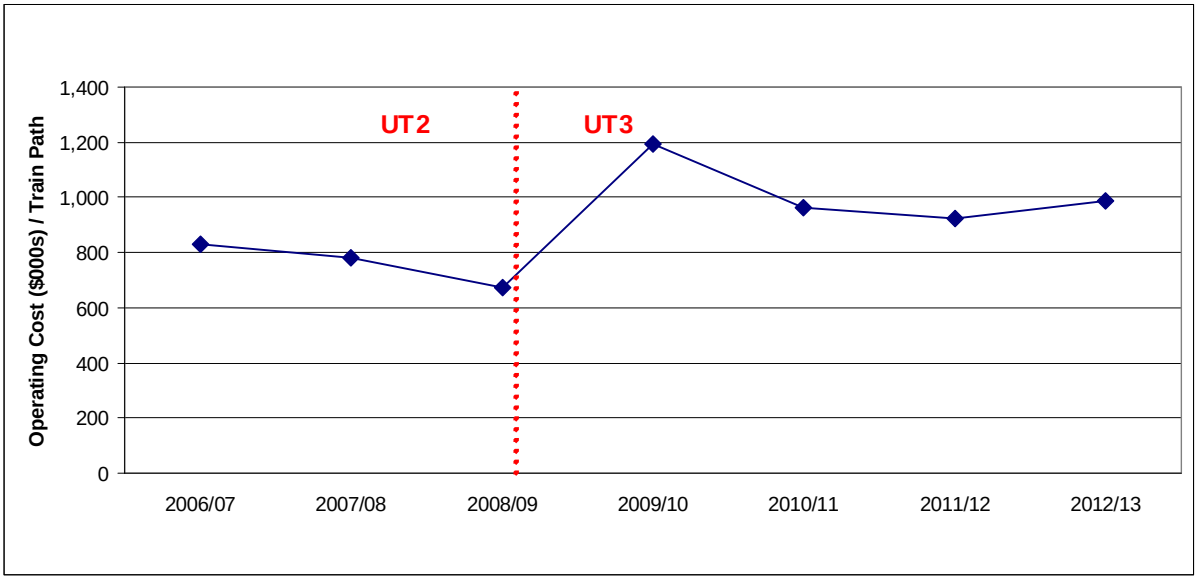
Figure 6 below shows the trend of forecast operating costs, both UT2 and UT3 datasets, for the coal region in total 2007/08 dollars. Actual costs for UT2 are available except for the 2008/09 year but it is clear from the inaccuracy of forecasts that a more detailed evaluation of the cost drivers is required despite the fact that overall operating costs are within reasonable boundaries when analysed on a macro scale.

Figure 6 Forecast of UT2 and UT3 Total Operating Costs for the Coal Region ($2007/08)



The forecast increase in operating costs between the final year of UT2 and the first year of UT3 in total dollars is around 51% – significantly more than the change in tonnage. When actual UT2 costs are compared with forecast UT3 costs the difference is less severe but the importance of forecasting accuracy is of concern to the author. If the operating costs are expressed as a unit cost i.e. in terms of per train path, as in Figure 7 below, the unit cost increases by around 90% but this is only because in June 2009 QR has revised its tonnage projections down for 2009/10 without any advice of decrease in cost. A more reasonable comparison would be for the latter half of UT3 where compared to the final year of UT2, the increase in unit cost will be approximately 45%. Unit costs should remain constant over time or reduce slightly with operational improvement and economy of scale and these increases require more detailed explanation.

Figure 7 Unit Forecast Operating Costs for UT2 and UT3, for the Coal Region ($ per Train Path $2007/08)



QR Network has identified two factors, which are expected to drive up absolute and unit costs in the UT3 period, namely, increasing business activity and increasing labour force costs. QR Network expects that increased business activity, especially in a capacity constrained system, will result in increased interaction with customers leading to increased planning, analysis and management which in turn will lead to a requirement for more resources.

It is reasonable to expect in an environment of increasing system complexity and reducing surplus capacity to see a need for increased management and resources. However, if this is examined in further detail, taking train control as a basis for measurement, there is some doubt over the plausibility of such substantial cost increases. Figure 8 shows the composition of QR Network's operating costs for the 2009/10 year. The break down for 2009/10 is very representational of UT3 as the various cost elements remain proportionally similar over the UT3 period.

Figure 8 Composition of QR Network's Operating Costs (2009/10)

Figure 8 shows that a large proportion [redacted] is made up of train control and operations management. A 25-30% increase in traffic from UT2 to UT3 represents a relatively modest increase in the number of additional trains per day. Taking the Goonyella system for example, an 18% increase in net annual tonnage is roughly equivalent to 7 additional trains per day. From the documentation provided there appears to be no major infrastructure alterations or signalling expansions planned (apart from GAPE) and thus no requirement for substantial train control increases.

In relation to the other reason for increasing in operating costs, which is increasing labour costs, Booz showed that labour cost pressures, especially in the Queensland coal region, are well above the CPI. We understand from discussions with QR Network, that there has been an exodus of labour from rail to other industries, particularly the mining industry, which over time has led to the coal network operating with a reduced workforce. This appears to have resulted in an externally applied productivity improvement, one that has not been shown to be unsustainable and therefore is not a reason for increased cost.

The impact of labour costs is likely to be smaller than QR Network's expectations. Falling staff numbers should ameliorate the effect of increasing labour costs, unless of course significantly higher labour costs are being paid to retain existing staff or increased overtime to maintain existing levels of productivity with

a smaller workforce. QR Network states that it is not paying higher labour costs (instead is offering this as a productivity improvement as quoted below) so this cost cannot be factored in.

> *"However, in lieu of seeking this indexation as part of its claim for SWR costs over the UT3 period, QR Network will recognise the high growth in wages as a productivity efficiency factor. This has been identified as a minimum of 2.5% per annum productivity factor over the UT 3 period.* (page 21 'QR Network's Access Undertaking 2009 on System-Wide and Regional Costs')

[redacted]

QR Network's reason for this increase is a number of 'new' functions not factored in UT2. They include coal business customer liaison, risk mitigation, train control management, operations management, safety, business management, capacity planning, technical standards, network performance, network safety, safe working and access unit, SPAD management unit, investigation and audit, dangerous goods, and network systems.

QR Network states that in becoming more segregated from QR, it has had to establish its own systems and to channel more resources and management into these areas. QR Network believes that the cost of many of these functions which were previously carried out by QR were not properly accounted for or fully passed on.

In its move to a stand-alone provider, QR Network is becoming more focussed in identifying the activities involved in managing its infrastructure. It is likely the large increase observed above is a result of improved reporting and better identification of inputs than necessarily increased intensity in these areas, although some increases will be expected with increasing business. While the reasons driving the increase appear reasonable, the magnitude of the increase is not. QR Network is forecasting train control and business management costs to rise by about [redacted] respectively. By any reasonable view such increases are difficult to reconcile with the projected increase in business activity ([redacted] in net

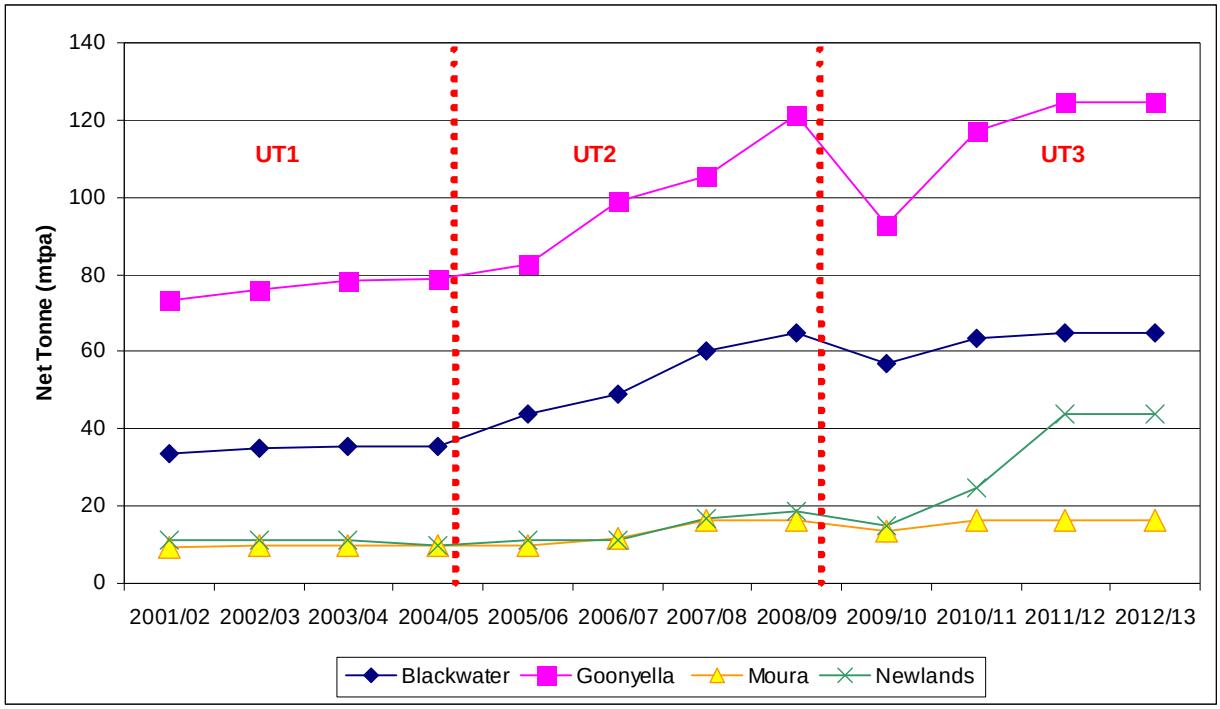
tonnage) or the shortcomings of cost capturing in earlier undertakings. We will identify specific issues of cost increase and propose reasonable costs in section 4.

3.5 Comparison of Current and Forecast Operating Costs at a System Level

The following section is a review of the forecast operating costs at a system level. The aim of this review is to check for consistency across the systems and to confirm the agreement of operating costs between UT2 and UT3 and within the UT3 period.

The actual and forecast net tonnages over time are shown in Figure 10 below for each of the coal systems. Forecast data has been used for the 2008/09 year as actual data is not yet available.

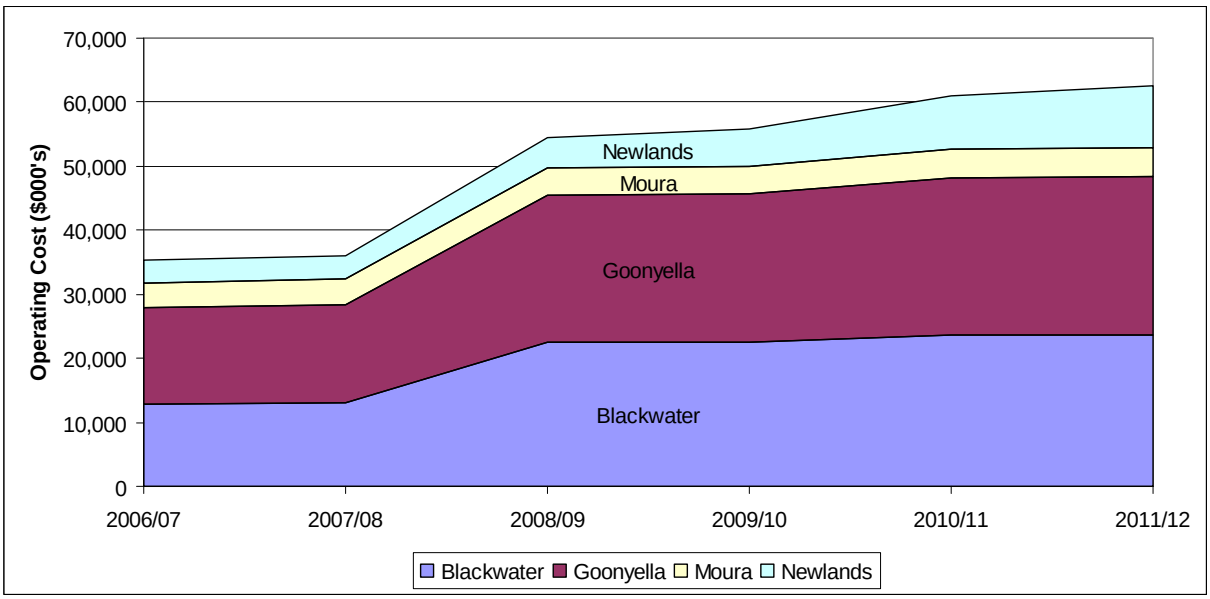
Figure 10 Actual and Forecast Net Tonnages by Coal System (including GAPE)



The Goonyella and Newlands systems see rapidly rising tonnages over the UT3 period while tonnages in the Blackwater and Moura systems remain constant. In June 2009 QR modified their tonnage projections substantially lower for 2009/10 and slightly lower for other years of UT3 without any commensurate change in budget, so any comparisons involving 2009/10 are distorted and not representative of the general trend.

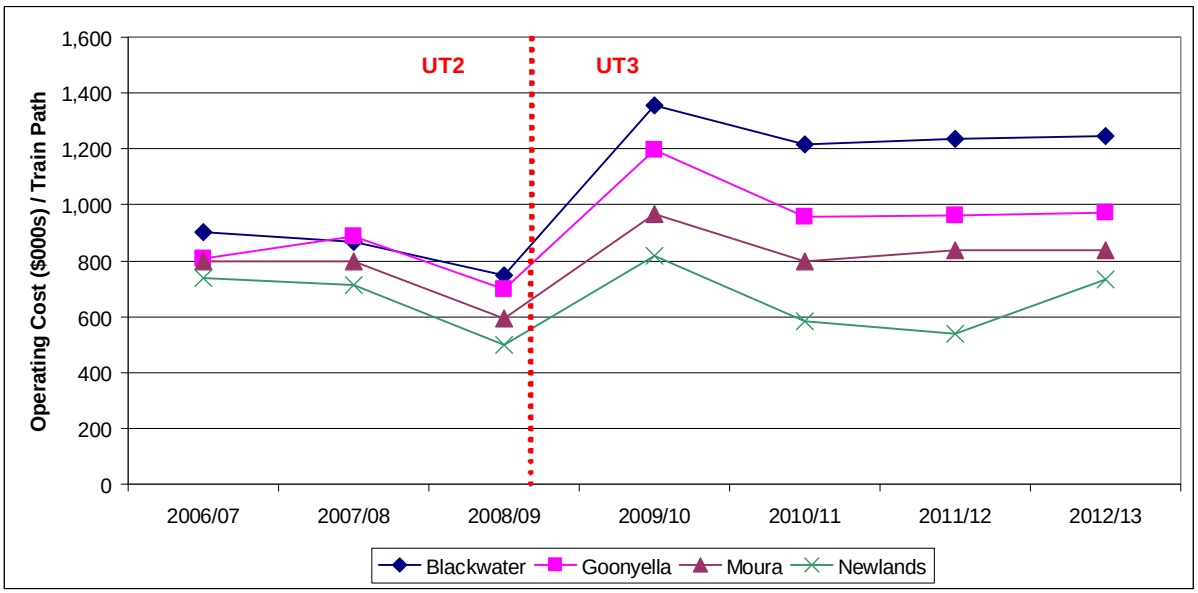
The operating costs for each of the coal systems in absolute, 2007/08 dollars are shown below in Figure 11. We have used the QR apportioned costs of the system wide costs, that is, the shared organisational costs not directly attributable to the coal region, to each of the systems in this analysis. The basis of QR's allocation, according to the Costing Manual relies substantially on gtk and train paths.

Figure 11 Forecast Total Operating Costs by Coal System (2007/08$)



A more useful measure with which to compare costs of each of the systems is by unit cost (i.e. the cost per train path) as in Figure 12 below.

Figure 12 Forecast Unit Operating Costs by Coal System ($ per Train Path)



From an examination of unit costs, it is evident that the four systems are operating at quite different levels of efficiency, notwithstanding the step correction that is observed between UT2 and UT3. Of the four, Goonyella is operating the most efficiently, with falling unit operating costs against rising predicted tonnages after 2009/10(which were indicated in Figure 10). By the final year of UT3 Goonyella is forecasting an increase of around 43% in net tonnage. Unit operating costs fall steadily after 2009/10 before rising in the final year. A similar trend is seen in the Newlands system, which is also predicting

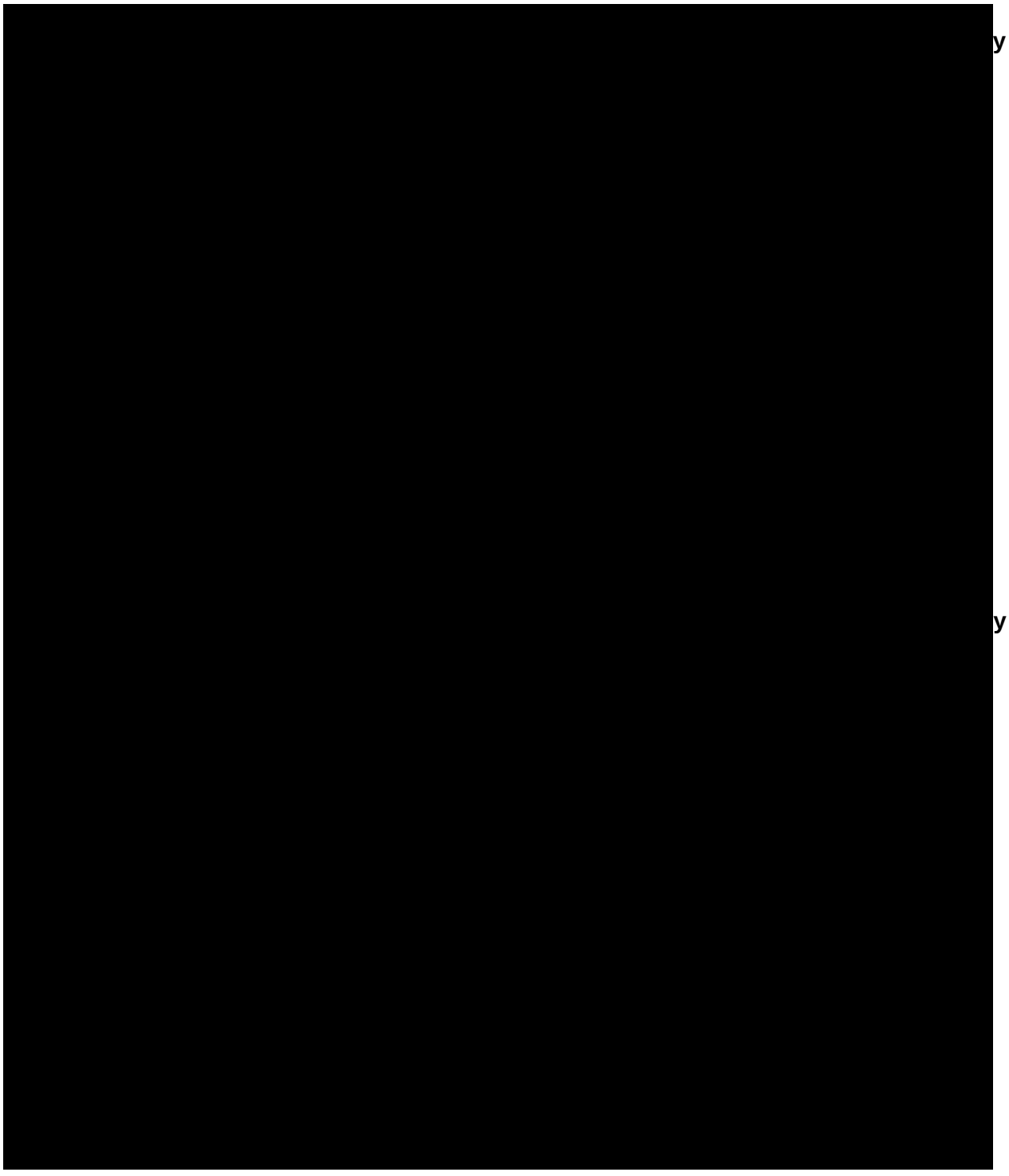
rising tonnages (Includes GAPE). It can be concluded from this that these two systems are achieving economies of scale and operating more efficiently than the other two. Blackwater and Moura on the other hand both predict fairly constant net tonnages over the course of UT3. However, neither of these systems anticipate a fall in their unit costs. Blackwater's and Moura's unit costs rise by 10% or more. So it is evident from these trends that Moura and in particular Blackwater, are less efficient than either Goonyella or Newlands.

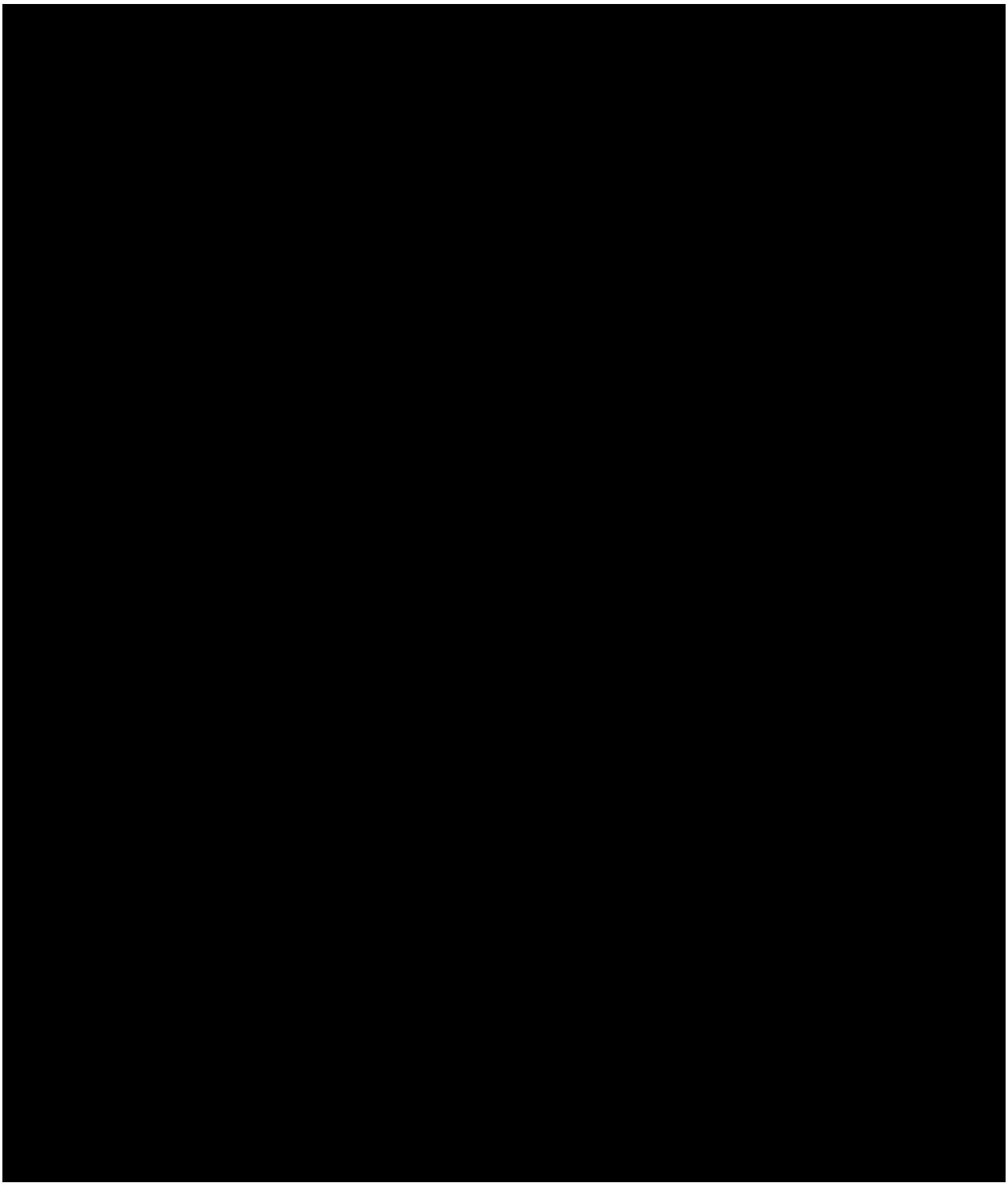
There is no obvious reason why Blackwater and Moura should have less efficient trends. Local factors, particularly asset condition may give rise to some differences, though these differences are more likely to be observed in maintenance than in operation. Likewise, a fundamental shift in task may give rise to differences. For instance a significantly altered environment may require additional resources for effective management – yet this is not observed in Blackwater's tonnages. No major infrastructure works are planned either. In terms of capacity Blackwater is operating in a similar environment to that of Goonyella. Trains typically operate every 30 minutes on the Blackwater system and every 30 minutes on Goonyella; Much of Blackwater's system is either duplicated or has relatively frequent passing loops. Goonyella's system is similarly mostly duplicated. So there appears to be no material reason for Blackwater's apparent inefficiency.

Generally speaking, it is not reasonable to see a rise in unit costs with rising tonnage (unless such an tonnage increase is so dramatic as to fundamentally alter the operating environment). While the Blackwater system to some extent will increase in complexity and reduce in surplus capacity with increasing traffic, its unit costs should trend downwards.

One would expect to see a decline in unit costs over time as the organisation matures and continuously improves. No major capital expenditure is planned to improve operating systems. With the exception of Goonyella, this lack of system improvement is reflected in constant or rising unit costs.

Figure 13 to Figure 16 show the forecast operating cost for each of the systems in absolute 2007/08 dollars by cost category. They all indicate very similar trends within UT3, apart from Newlands, which sees a significant rise in train control because of the GAPE project. As noted before, the Blackwater system is forecasting real increases in train control, business management and infrastructure management costs while its net tonnages are expected to remain unchanged.





3.6 Summary

A comparison of operating costs between UT2 and UT3 reveals a marked increase in costs in each of the various cost categories. The cost increase appears disproportional to the increase in business activity. Net tonnages are forecast to rise by about 25-30% between the final year of UT2 (2008/09) and the first year of UT3 (2009/10) but total operating costs are expected to rise by around 51%. Some cost

categories such as train control and business management rise by greater amounts ([redacted] respectively). QR Network has identified the following factors as driving the cost increase:

- Increased segregation of QR Network from the wider QR organisation leading to improved identification of the activities required to manage below rail infrastructure;
- Increasing complexity in the system, that is, the complexity that comes of reducing surplus capacity and increasing activity;
- A change in cost allocations that result from QR Network's increasing stand alone status.

While these factors appear plausible, the magnitude of the increases appears difficult to justify in terms of business activity.

Nevertheless, a comparison of QR Network's operating costs indicates a level of consistency with other below rail infrastructure operators such as ARTC and WestNet at the macro scale. On the basis of this comparison, not withstanding the limitations of benchmarking, QR Network's estimated costs would appear globally reasonable, though inconsistent across systems and unjustified at the detailed level. While cost drivers have been identified, a detailed analysis on a function by function basis looking at each activity and costs arising has not supported the submission. The detailed review in the following sections will explore these issues further.

4. Detailed Review of QR Network's Forecast Operating Costs

In this section we have made use of The Submission, Response 1 and particularly Response 2 from QR to detail the costs associated with Operating activities, as well as reference UT3MCS.

4.1 Introductory Analysis

We have been able to develop a "picture" of QR's regional and system wide cost structure and which has been summarised in Table 4. A comparison has been made of the way costs were expended and allocated between those in UT2 and those in UT3 and a calculation made of the dependency of the costs on the Costing Manual allocation principles.

We are concerned with the fact that despite increased ring-fencing, QR Network's Operating Costs in the CQCR still rely on Costing Manual allocation mechanisms for a large part of their costs. Table 4 indicates that approximately 50% of the costs attributable to CQCR are derived from allocated costs and there is a large potential for inappropriate costs to flow to the CQCR.

The overall approach to the analysis in this section is to compare the costs proposed in UT3 with that incurred in UT2 and in addition to explore the potential for inappropriate cost allocation or double counting by way of the activities proposed in UT3.

While in UT3 the QR organisation structure proposed to manage the coal network has been oriented toward being as self sufficient as possible, the UT2 structure was essentially a common workforce servicing all aspects of QR's business including passenger trains and general freight. Consequently UT2 costs were mostly allocated by way of a standard formula whereas many of the costs in UT3 are direct costs.

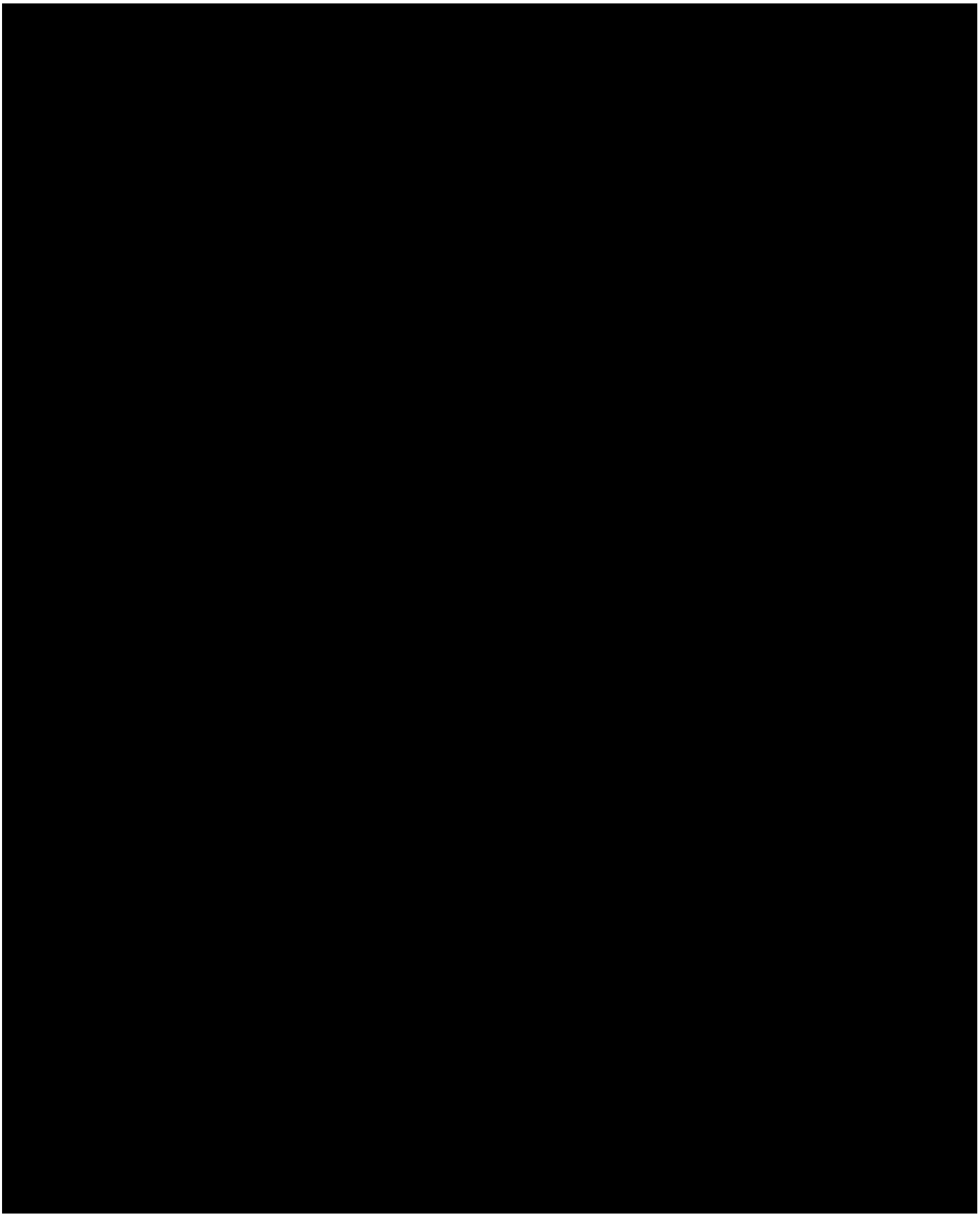
The organisation for the below rail "Operations" constitutes approximately 400 persons[10]. With an expenditure of approximately $55m to $70m per year over the UT3 period, this represents a significant part of the access cost. Even with the application of UT3 specific costs, approximately 50% still comprises allocated costs. These issues detract from QR's own position of being stand-alone. They appear to be more stand-alone than they were, but well away from being legitimately stand-alone.

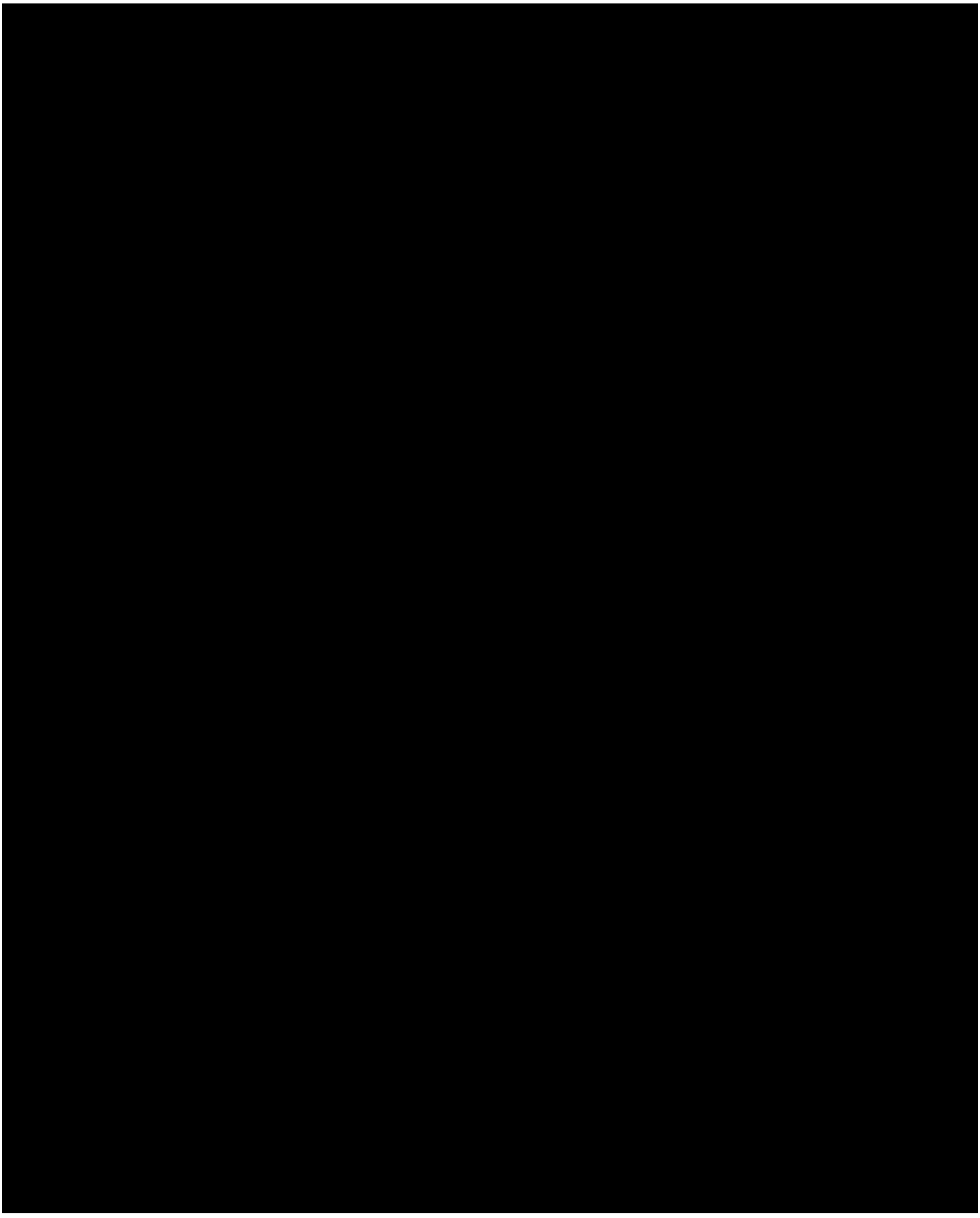
It should be stated from the outset that some of the organisational presumptions under-pinning the UT3 costs estimates have not yet been implemented and therefore the estimates are both projections and predictions. These predictions have required estimates of the quantity and productivity of work previously performed by the Corporate resources now brought into the specific CQCN organisation.

Our view overall is that QR Network's estimates are based on the pessimistic view that no economies are available from a more focussed organisation and that all resources used in the previously "integrated" organisation operating during UT2 will need supplanting and expanded upon.

We are also of the opinion that projections beyond the more immediate 2009/2010 year are based on a somewhat linear model of activity. That is, increased task will "automatically" result in increased resources being necessary. Effectively this means that no economies of scale are available either through initiatives or process automation.

[10] Table 4 details the resources identified and implied by QR's Submissions





We also note from Table 4 that the only costs that are directly attributable to a particular System (Moura, Blackwater, Goonyella, Newlands) are those associated with very localised activities such as “Yard Control. This table has not reviewed the System allocation methodology but we are concerned that the methodology relies on gtk and train path measures, which may not reflect the drivers of cost adequately.

The following sections of this report deal with particular aspects of the Brief.

4.2 Double Counting or Inappropriate Costs

In the aspect of “double counting”, that is that costs have found their way into two operating cost centres, Table 4 provides confidence that staff numbers are congruent with their cost appropriation. The table suggests, within the accuracy of FTE counting and expected costs, that staff have been costed to their appropriate cost centre. Staff numbers and cost appear to match ( ).

However Table 4 does highlight the dependence on allocation of costs using the Costing Manual's "Standard Allocator". If that allocator is incorrect by say 10% then the Operations costs will be incorrect by 5%. The Standard Allocator therefore requires a high degree of scrutiny.

We recommend that a review of the method and rationale for allocators be undertaken. We are particularly concerned with the dependence on gtk as an allocator given that large portions of Corporate costs and QR Network costs are dependent on this parameter. In particular, that gtk is an appropriate measure for management effort in the suburban network.

Hence suburban costs accrue and are pooled to be allocated, but suburban task is ineffectually accrued and are therefore understated in the task allocation, placing an unreasonable burden of CQCR.

In Table 5 a linear series of the major cost drivers for operations cost have been tabulated and in Figure 17 these data are shown using the first year of UT3, 2009/2010 with index 1. The data provide the characteristics of the relationship between the drivers and their associated costs.

Table 5 Cost Drivers for Operations Cost (Including GAPE), $07/08 Costs

Parameter	07/08	08/09	09/10	10/11	11/12	12/13
Net Tonnes Km (000)	37,914,560	46,657,597	42,314,140	53,013,714	61,254,404	61,298,832
Train Paths	41,763	53,460	45,694	57,791	65,890	63,353
Track Km	2,341	2,436	2,530	2,566	2,582	2,593
Total Operations Costs ($000)	49,149	51,822	54,494	55,736	60,995	62,642

Notes: Operations cost and track km for 08/09 calculated as the average of 07/08 and 09/10, historical/actual data for 07/08 from "QR's UT3 Model.xls", all other data from Response 1. all $ 07/08.

Figure 17 Operations Cost Drivers Index

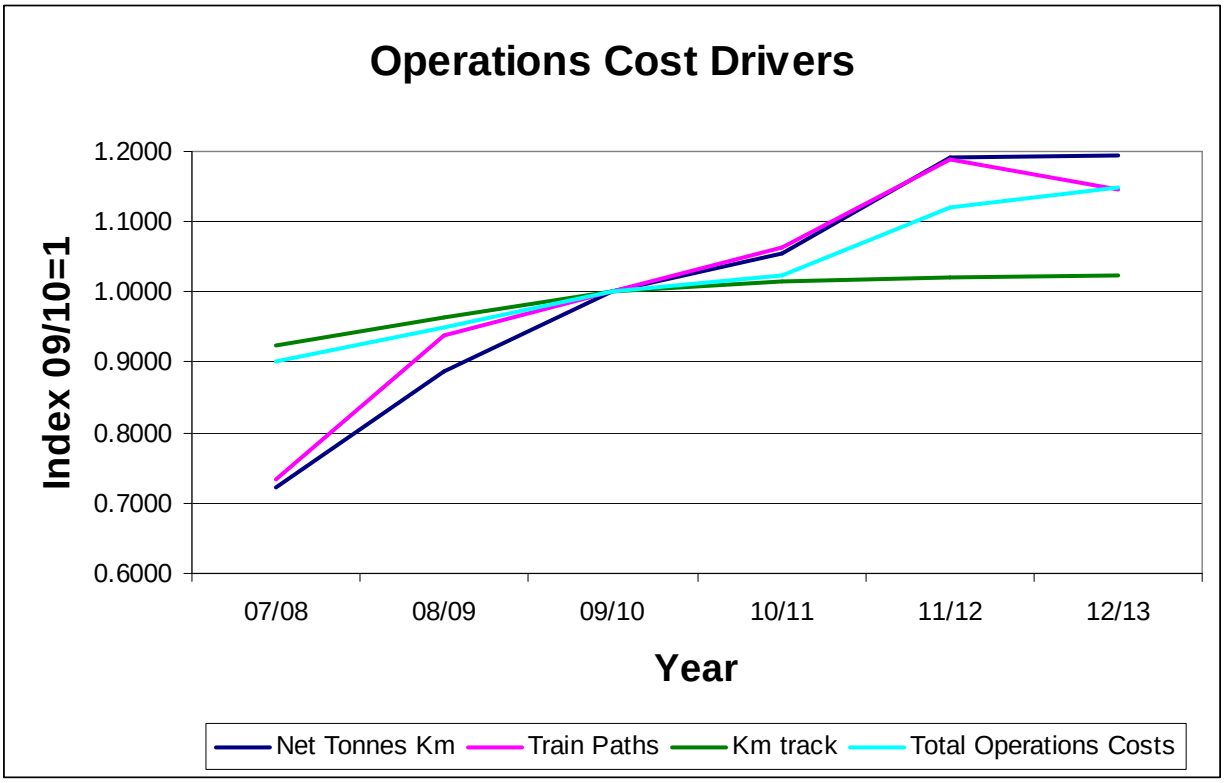


Figure 17 shows that Operations Cost is reasonably insensitive to tonnage and train paths and therefore has a large degree of "fixed" or unvarying costs but unfortunately continues inexorably upward and is largely unresponsive to a flattening or drop in activity. In particular, the lower task submitted in June 2009 has not been mirrored in lower costs.

In terms of "inappropriateness" our view is that the large component of the costs arising from the allocation of System Wide costs continues to limit the responsiveness that could be possible in a stand-alone environment.

The Regional costs attributable to CQCR are $21.705m. For the 20010/20011 year, $8.812m of the identified $15.203m costs that can be specifically allocated in the QR Network business have been allocated to CQCR. Thus only $6.391m has been specifically allocated to other businesses including suburban and regional freight.

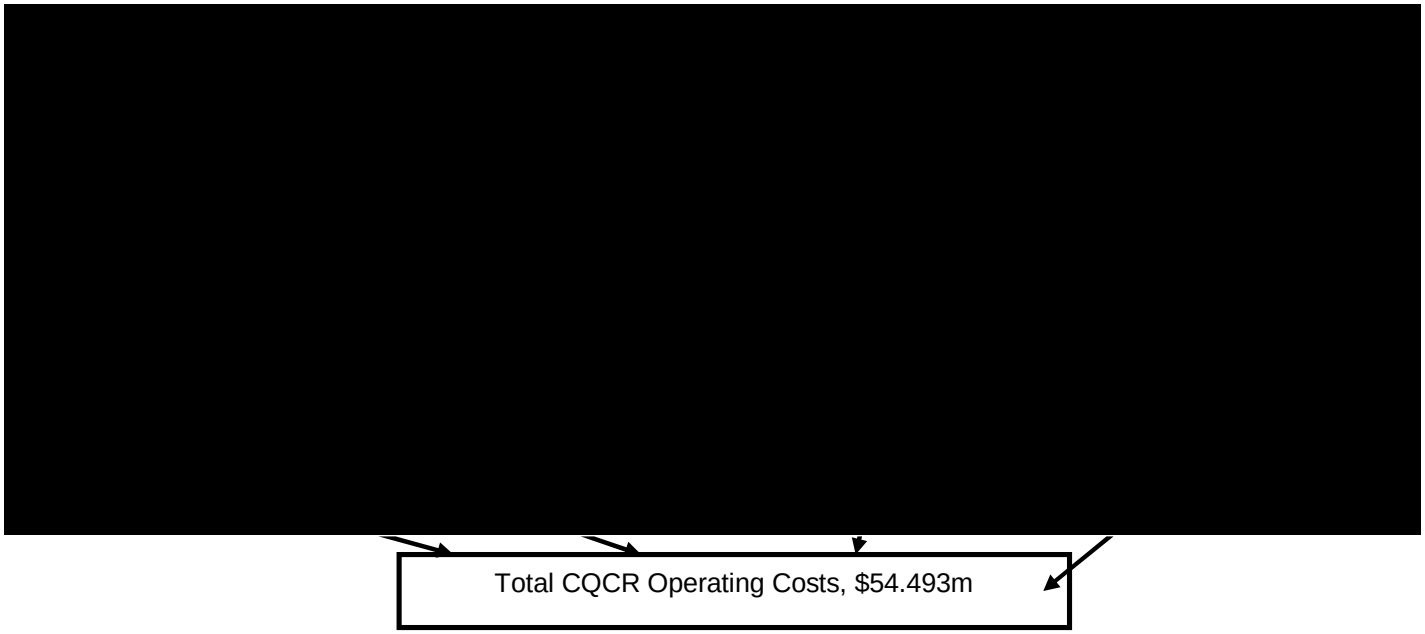
The remaining $59.201m incurred by QR Network is then subject to an allocation by the Costing Manual. System Wide costs total $74.404m.

Due to the use of the Costing Manual's "standard" allocator of 40.5% in the year 2010/2011 rising to 46.5% in 2012/2013, CQCR is then encumbered with a further $23.976m from this general pool, about three times the specific allocation.

QR Network may have brought Corporate costs into its own cost base but it has still not been able to identify significant amounts of cost as specific to its own businesses. Notably, of its total Operating costs of [redacted] only [redacted] 38%, could be said to be specific, the remainder is in a pool to be allocated according to the Costing Manual.

Our view is that that specific percentage is not enough for a business so large and so important as the CQCR. Figure 18 indicates the relative size of the make up of costs proposed by QR for 2009/10.

Figure 18 Year 2009/10 QR Proposed Cost Make Up (GAPE Inclusive)



4.3 Operating and Other Costs

QR Network's on-going reform to isolate other parts of the business from the regulated coal infrastructure has assisted in the ring-fencing of many cost areas. Notwithstanding our general unease about the presence of approximately 50% of its Operations Costs emanating from allocated costs we also have specific comment to make about other minor costs, which may be indicative of other more substantial cost areas but which are shielded from view because they are allocated from System Wide costs.

4.3.1 Dangerous Goods

QR Network in the Submission and in Response 2 have made specific reference to the need for the coal business to have resources in place so as to enable interface and response with Dangerous Goods traffic for safety and other purposes. This circumstance is certainly realistic because the "real world" contains interacting situations that need to be managed.

However in a Stand Alone regime, while these interfaces incur cost, it is not the below rail coal business that should incur those costs. Just like any other non-coal traffic, if they impose costs on coal then they must pay and the net effect of those costs should be zero.

This principle is demonstrated in many aspects of the regime. For example, if high speed passenger services require fast response times, more expensive maintenance or simply extra maintenance, then it must pay. Dangerous goods or passenger traffic does not provide the coal users with any benefit and therefore should incur no net costs.

While minor, the dangerous goods example may be an indicative of a general mis-interpretation of the Regulations[11], where costs imposed by others are "accommodated" because of a belief that there is an obligation to perform functions in association with other traffic. QR's approach is consistent with an allocative method of costing, where all parts are spread to others and detracts from their objective to portray the CQCR as stand-alone.

4.3.2 Safeworking/ Yard Control

In QR Network's Response 2 a detailed breakdown of functions that influence Operations Cost includes the explanation as follows:

> *During construction projects such as new loops and duplication, normal signalling and safeworking systems have to be suspended and either train movements are suspended or labour – intensive manual systems introduced temporarily over the affected sections in order to maintain train operations across the affected parts of the network. These costs are not included in the capital works as they are incurred for operational reasons during construction activity. The actual reported cost did increase substantially in 2006/07 because of this reason.*

Again, the increase in costs during 2006/07 were not large in comparison to the overall budget for Operations Costs but equally indicate a misunderstanding of the Regulations in relation to the appropriateness of cost categorisation.

Those Yard Control costs would not be incurred if the capital works were not underway and despite the logic that to incur them, though more expensive than not, would improve the supply chain, may be more appropriately classified as Capital expense.

We are of the view that other costs are likely to be "accommodated" either in a genuine attempt to avoid costly administration or simply as a result of misinterpretation of the Regulations.

4.3.3 Above Rail Costs

The data asked for and provided by QR Network has not revealed any glaring instance of above rail costs being incurred by QR Network. With such a large proportion of costs derived from allocation and costs at the Regional level not directly attributable to a System in most instances, it is unlikely the data would show above rail costs.

On our inspection in late 2008 of the Mackay Train Control building we noticed a group of personnel involved in above rail activities associated with crew rostering and support for crew. QRNational employed these persons who would be relocated to the above-rail facility at Jilalan in the near future. In UT1 an integrated Train Control workforce would have performed the duties of these persons and an allocation made of their time for below rail/above rail purposes. The labour costs are now more transparent in UT3 since each group are clearly delineated to either above or below rail..

[11] QCA Decisions and Approved Undertakings

However, are the costs of their accommodation and associated costs now apportioned? We note that in the QR Network data an entry indicating an adjustment for Train Control costs associated with non-coal traffic. We do not see any adjustment for above rail costs of the kind observed in Train Control for crew rostering.

4.3.4 Other Non-Coal or Above Rail Adjustments

QR Network have supplied detailed information in a number of spreadsheets including "SWR Hist Detail for QCA 20 Mar 09 - FINAL.xls", "SWR Cost Detail for QCA 14.11.08.xls" and "Summary UT3 Costs - op & maint.xls".

Inspection of the data reveals that only those adjustments associated with Train Control non-coal costs appear. There would surely be other adjustments to other activities.

We are concerned that costs associated with Safeworking / Yard Control, Regional Mgt, and IM Regional Management and Coal Chain Management, have not been adjusted in a similar manner for traffic and infrastructure not associated with regulated coal infrastructure.

We recommend that QR Network transparently display their adjustments for each activity such as they have with Train Control, or provide the methodology for their estimates in the activities that deal with non-cola traffic or non-coal infrastructure.

4.3.5 Recommended Adjustment to QR Network's Estimates

In our view there is potential for QR Network to be incurring costs associated with other traffic or non-regulated below rail assets. This potential originates from:

- A high proportion of costs being allocated from a more general pool

  We recommend using 07/08 actual costs as a base, being [redacted] Regional and [redacted] System Wide, and the total of these two costs be held constant at [redacted] for the UT3 period for task including GAPE. Since Regional costs need to increase in direct relation to the increase in the task, System Wide costs are therefore affected and their resulting allocation shown in Table 6. Further adjustment has been applied for misinterpretation of the Regulations as detailed in the next section.

  This construct is a proxy for the expected result of a more specific allocation of costs into other business entities of QR Network. In practice, the "standard" allocator would be applied to a smaller pool after other specific costs are distributed to other businesses.

  In addition, this proxy will most probably under-estimate the reductions because the "standard" allocator would more directly represent the (gtk, train paths, passenger kms etc) task which is only crudely represented now with gtk and train paths. If QR could transparently identify the task in terms such as train paths, passenger kms, train km or gtk then these could be correlated with cost and a more appropriate allocation be made.

- Minor misinterpretations of the Regulations in relation to other traffic or capital expense

  In addition to the changes due to System Wide allocations we recommend a reduction in Operations Costs of a similar quantum as the Safeworking/Yard Control and Dangerous Goods misinterpretations of [redacted] and [redacted] respectively, for a total of [redacted] in each year.

Therefore the resulting recommended Operations Costs are shown in Table 6 together with the adjustments on the QR submission.

While this assessment has concerned itself with operations costs including GAPE in order to explore the principles associated with double counting and inappropriate cost allocations, Table 6 also includes recommendations excluding GAPE. Note that the difference between the recommended values of GAPE (included) and GAPE (excluded) is not exactly that of the GAPE costs submitted by QR because of the adjustments we have made to the System Wide allocations.

We note that in June 2009, QR submitted revised (slightly lowered) tonnage estimates for 09/10 and the remainder of the period, but without revised operations or maintenance budgets. The recommendations in column 9 of Table 6 represent the recommendations for the task prior to the June 2009 submission. Column 9 costs have been calculated for 2009/2010 and then adjusted for subsequent years on the basis of task increases for the remaining years. The other information shown for those years are a proxy for how QR could estimate appropriate categories of cost. The sharp decrease in task in 2009/10 would not be accommodated by a sharp decrease in operations costs in that year because costs are not that flexible/variable. However, overall a decrease of approximately 1% is expected, mainly associated with the Newlands task, which is projected to be approximately 25% lower (Excl GAPE). These are shown in column 10 of Table 6 by applying 99% of the calculated recommendations in column 9. Column 11 are those costs proposed by QR, excluding GAPE.

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

1	2	3	4	5	6	7	8	9	10	11
Year	[redacted]				CQCR Standard Allocator (QR Proposed)	[redacted]		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					40.0%			$49.149	$49.149	
2008/09					40.5%			$50.155	$50.155	
2009/10					40.5%			$51.161	$50.65	$54,493
2010/11					40.5%			$51.161	$50.65	$54,158
2011/12					46.0%			$52.501	$51.98	$56,197
2012/13					46.5%			$52.501	$51.98	$56,697

Notes: Year 07/08 has calculated Specific costs on the basis of 40.5% Standard Allocator, Year 08/09 is the average of 07/08 & 09/10, Regional costs are those as proposed by QR, Allocated Specific System Wide costs are those as proposed by QR, for years 08/09 to 12/13 the sum of the Total System Wide costs and Regional Cost has been kept constant. The CQCR Standard Allocator is that proposed by QR.

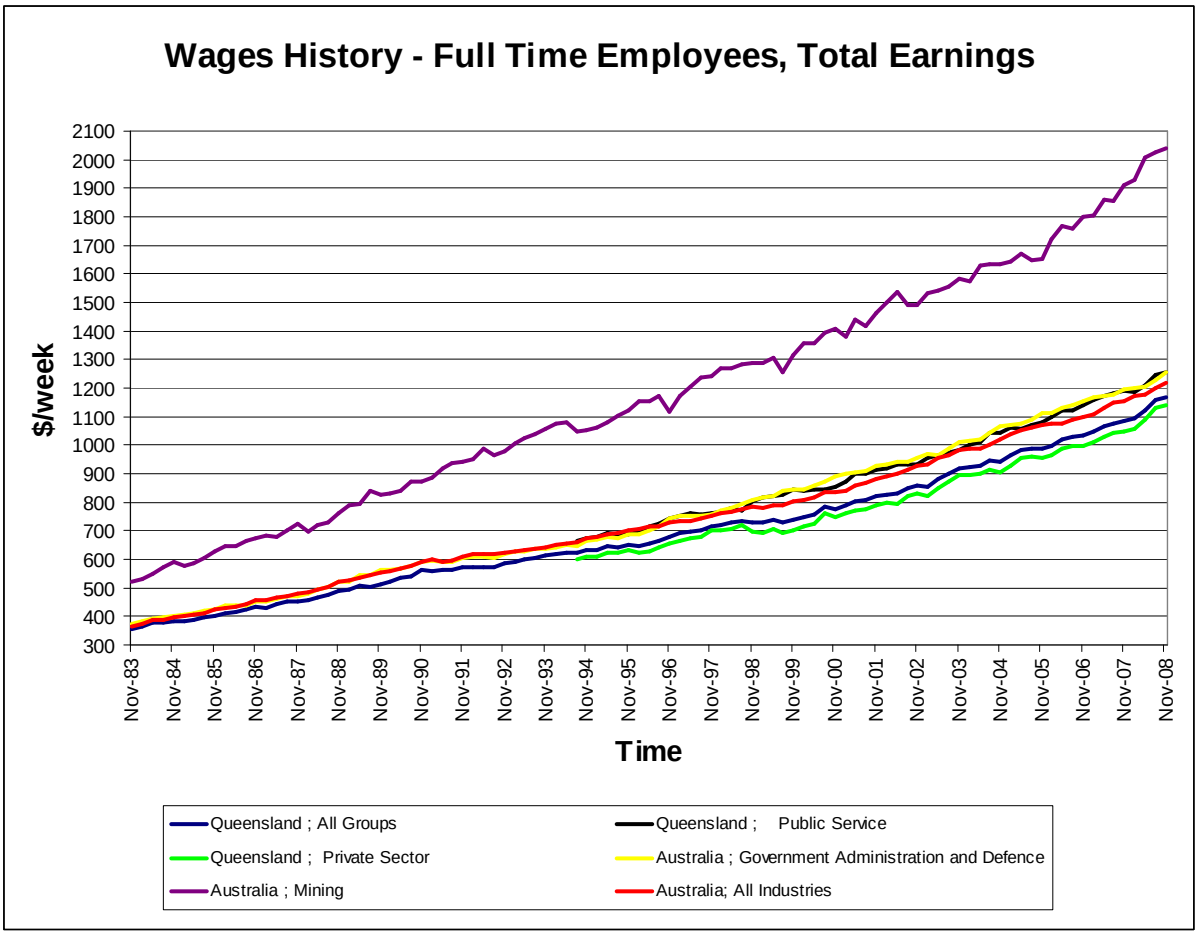
4.4 Productivity

QR Network has suggested that productivity incentives in its UT3 Submission *"is based on an assumption that labour costs will only grow at CPI (whereas labour costs have grown at a margin above CPI and are likely to continue to do so into the future, at least for the UT3 period)".*

QR submitted the Submission in September 2008 but it was probably drafted in the three months prior. No doubt the view that wages costs were increasing faster than CPI was well founded in the context of 2007/2008 when BOOZ was commissioned to carry out that work.

The circumstances in June 2009 are now different. The "assumption" is now not well founded. Figure 19 and Figure 20 indicate historical indices that are relevant to the appropriateness of forecasts and productivity factors.

Figure 19 Wages History - Various Groups

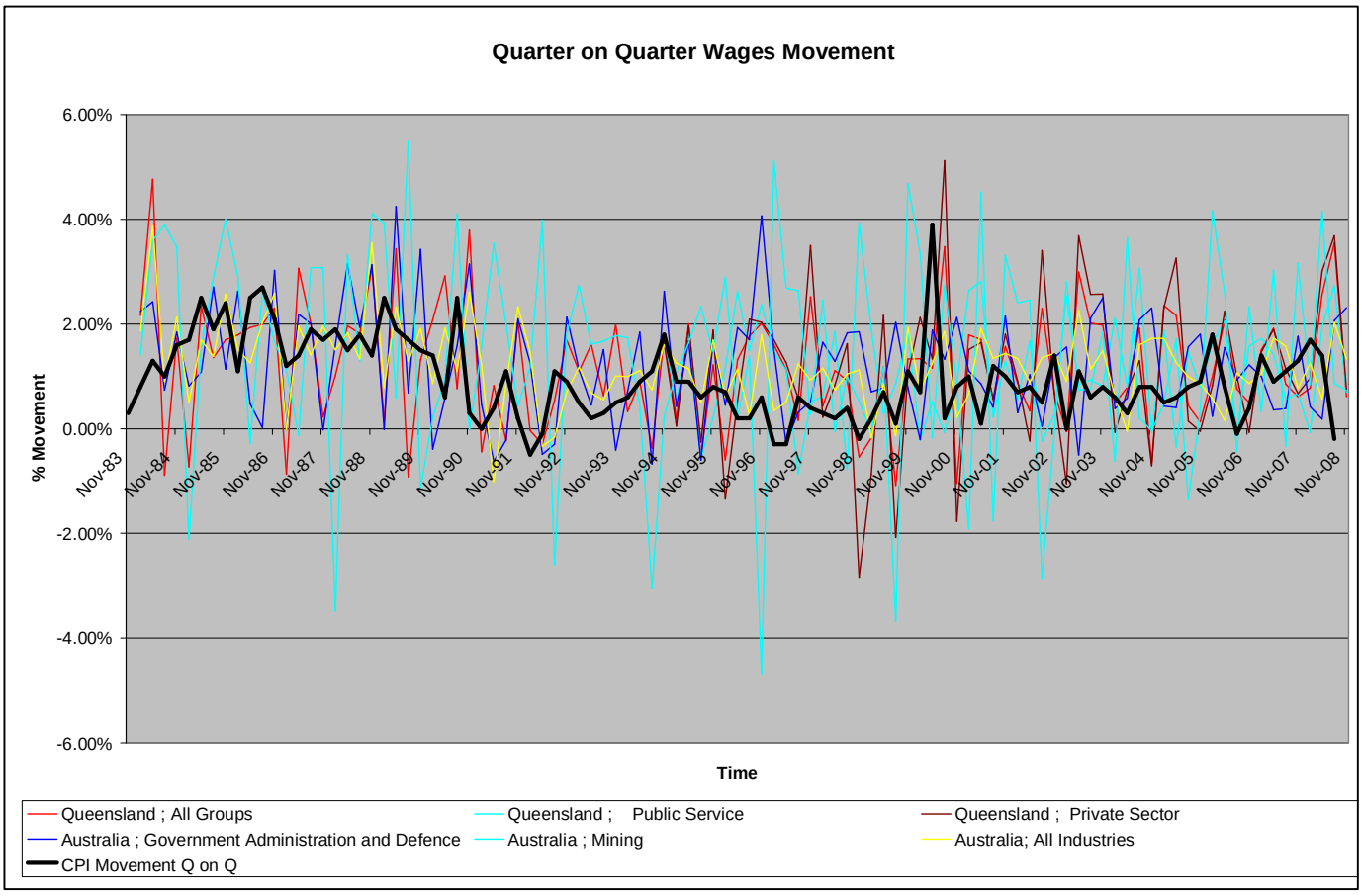


Source: ABS Series 6302.0 Average Weekly Earnings

Figure 19 is the wages/earnings history for various groups including those that have a bearing on the wages competition relating to the types of services provided in Queensland for the Regional and System Wide services.

By inspection the trend over the past 3 years in most sectors shows a significant upswing compared to the longer term trend. Areas of negative growth and zero growth are common amongst the steadily rising trend and the past 3 years is not indicative of a longer term trend.

Figure 20 Quarter on Quarter Earnings and CPI (Brisbane) Movement



Source: ABS Series 6302.0 and ABS Series 6401.0

In Figure 20 the quarter on quarter movement is plotted for each of the earnings/wages series and overlaid by the movements in CPI (dark black). There is general alignment between CPI and wages and therefore is a good indicator of the movements.

We note specifically the dive in CPI movement in late 2008 and therefore the possible wages dive (data is not available on the next quarter on wages until July 2009).

Our conclusion is that wages movement is more volatile than CPI but continues the same general trend and therefore productivity trends linked to CPI and any incentive for productivity should remain with a link to CPI. Instantaneous productivity measures should not be linked to short term wages movements.

Therefore the offer by QR to decouple the CPI link, resulting in a projected productivity increase based on wages movement, is likely to be short term only. In the very near future (2009/2010) it is likely that QR's productivity increase due to their suggested mechanism will turn negative.

Consequently we are of the view that the projected productivity bonus offered by QR is of no value.

We therefore suggest CPI-X format continues to present the most appropriate long term mechanism. An extensive review of the quantum for "X" applicable was carried out by the ERA of WA in 2004[12]. Therefore in the context of that study where CPI was in the region of 4%, it is suggested a quantum for X should be 25% of CPI. That is, the escalation would be targeted at 75% of CPI.

[12] Rail Access Regulation Review CPI-X Implementation –Final Report, 2004

5. High Level Review of QR Network's Maintenance Costs

5.1 Introduction

The following section comprises a high level review of QR Network's forecast maintenance costs for the UT3 period. This review involves benchmarking QR Network's operations with those of similar below-rail infrastructure operators and comparing QR Network's current and future maintenance costs at a regional and system level.

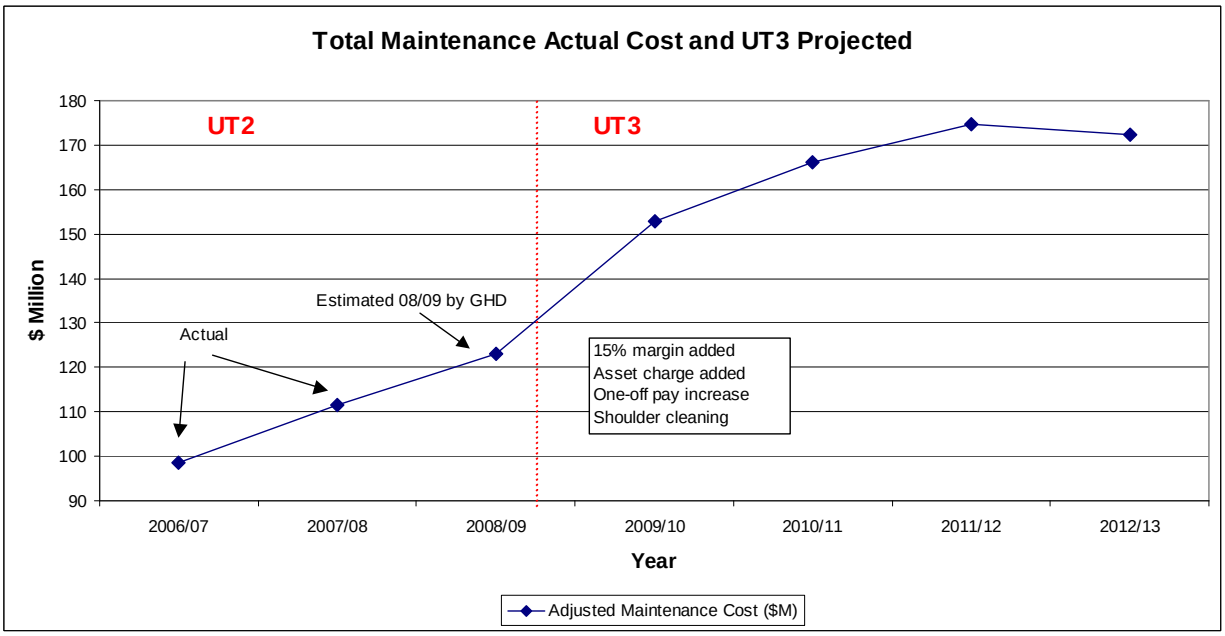
All material referenced in this section is publicly available and consists of data from the following sources: public documents relating to other below-rail infrastructure operations; QR Network's UT3 submission and historical data from earlier undertakings.

Part of this assessment is a review of a report by WorleyParsons ('Worley'), which was commissioned by QR Network to support the reasonableness of UT3's forecast maintenance costs.

From the outset it is worth noting that the basis of QR's maintenance cost estimates for UT3 is very different than that previously seen in UT1 & UT2. In particular, QR has approached the estimate using bottom up methodology and in doing so have claimed previously unrecognised costs in asset charges and margin. In addition their approach to maintenance in the context of the coal supply chain requirements has resulted in more defined work programs, defined possession requirements, shifts and production rates. Overall this has produced a more robust estimate than previously.

Figure 21 highlights the significant change in maintenance cost proposed by QR in UT3.

Figure 21 Total Maintenance Cost UT2 & UT3 ($07/08 Excl GAPE)



5.2 Definition

Past undertakings have presented maintenance costs in particular cost categories. Costs in QR Network's UT3 submission have been presented in a slightly different make up to better reflect how costs have been captured in the field. Some costs have been amalgamated, namely, track, structures and facilities. As the structures and facilities components are small it should make no material difference to the assessment or comparison with previous years. The cost categories used by QR Network in their submission are as follows:

- Ballast Cleaning
- Resurfacing
- Rail Grinding
- Track Recording
- Ultrasonic Testing
- Track, structures and facilities
- Trackside systems
- Traction

We have undertaken this high level analysis and the more detailed analysis in 6 excluding the tonnage and the costs associated with GAPE and in constant $ 07/08 (June 2008).

5.3 Benchmarking with below rail infrastructure operators

5.3.1 Comment on WorleyParsons Report

WorleyParsons in association with other partners has undertaken an extensive survey of the plans proposed by QR for the UT3 period, the condition of the infrastructure, the methods of work and a benchmarking of railways from around the world in their report "UT3 Parallel Comparison Exercise", 18-Aug–08. The main aim of the work was "*To validate the works supporting the submission*"[13].

WorleyParsons main findings were"

> "*The Consultant confirmed the appropriateness of the majority of existing KPIs but highlighted*" some areas of improvement and that "*The Consultant is confident that the comprehensive review of the KPI structure that is currently being undertaken for the commencement of the UT3 will eliminate most of the … concerns*"
>
> *"The Consultant was concerned at the level of coal fouling on the network and through observations in the field concluded that much of this was due to poor loading and unloading practices and faulty closing mechanisms on rolling stock."*
>
> *"The Consultant concluded that it would be beneficial to supply chain operations to introduce financial mechanisms which provide incentives to all parties to introduce innovative mitigation solutions or procedures which will minimise the coal fouling issues on the network".*

[13] Page i

"The Consultant observed that within the field engineering practices, such as rail management (monitoring of rail wear for example) the systems currently adopted by QR can be considered world leading. QR can also be considered a world leader in the use of regular measurements of percentage void contamination to plan ballast cleaning and in its innovative trialing of the use of stone-blowers for heavy haul operations".

"The Consultant was impressed with the current plans for the implementation of a new GIS based asset register".

"The Consultant conducted an international benchmark on engineering maintenance costs and found that QR costs were neither the highest nor the lowest". However it was acknowledged that QR's categorisation of costs made it difficult to make comparisons.

"Overall the Consultant concludes that:

• The achievability and realism of existing KPI's is reasonable although some work is required to refine the data obtained in order to enhance the decision making process and provide greater incentives for quality improvement at a holistic supply chain operation level. This work is currently under progress for the UT3 undertaking;

• In general asset condition was found to be good, and existing strategies, standards and processes in line with international trends. Engineering judgment and reasoning was found to be sound, and the scope and volume of work appropriate for the existing site conditions. Some strategies and processes were judged as being innovative and to be commended;

• In general costs were calculated as being comparative in international benchmarking, with allowances in some items for specific North Queensland conditions. A critical requirement was identified for specific studies which address the reality of the Central Queensland geography".

Essentially then, WorleyParsons found that QR is operating very proficiently and plans for the future will improve that performance. While not at the lowest level of maintenance cost compared to other railways it was difficult to make direct comparisons.

WorleyParsons used amongst others, a former Chief Civil Engineer of QR and research experts from the Transportation Test Centre Inc in the US. In addition their desktop analysis provided the theoretical base to incorporate field audit and the application of practices used elsewhere in the world.

The report is regarded highly by this consultant.

WorleyParsons confirmed that the cost base proposed by QR and approved by QCA in UT2

"were fundamentally flawed as they:

• Did not anticipate the current mineral boom and consequent increase in coal traffic;

• Did not sufficiently take into account the impact of increased activity on unit rates for key activities;

• Did not anticipate changes in maintenance practices required to maintain the track in fit for purpose condition in view of increased throughput and capacity expansions;

• Did not truly reflect the cost of delivering maintenance activities."

This assessment does not engender confidence for longer term sustainable maintenance but the process now adopted by QR has turned that assessment around.

In as much as the aim of WorleyParsons involvement was "*To validate the works supporting the submission"* the implication being a post justification of QR's strategy, we believe the work WorleyParsons undertook was much more than that and involved pro-active feedback at the least and probably the injection of new ideas. The WorleyParsons report is not written to identify the origin of the ideas.

WorleyParsons make a number of very important recommendations, the most important as far as longer term efficiency is concerned is "The Consultant concluded that it would be beneficial to supply chain operations to introduce financial mechanisms which provide incentives to all parties to introduce innovative mitigation solutions or procedures which will minimise the coal fouling issues on the network".

This recommendation is vital to prevent spiralling maintenance costs and possible supply chain bottlenecking due to the problems of organising sufficient possession time to carry out the works. QR's ballast treatment proposal in UT3 is only the first stage of a long and continuing battle to bring coal fouling under control and subsequent Undertakings will incorporate even higher maintenance costs than those seen in UT3.

QR has not proposed any mechanism to implement this recommendation.

5.3.2 Comparison with WestNet and ARTC

Similarly to operating costs in the previous section, ARTC and WestNet are considered the most relevant and comparable below rail infrastructure operators: as such, their costs have been selected for comparison. Table 7 below shows WestNet's and ARTC's maintenance costs expressed as a ratio of GTK. All costs are presented in 2007/08 dollars. The same figures are shown graphically in Figure 22.

Table 7 QR Network, ARTC and WestNet Unit Maintenance Costs

	QR 09/10	WestNet 07/08	ARTC Hunter Valley Coal 06/07*	ARTC Non Coal 06/07*
Maintenance Cost ($'000) (2007/08$)	152,800	31,364[14]	32,416[15]	-
MGTK	67,864	20,880[16]	16,261[17]	-
Maintenance Cost $ / MGTK	$2.25[18]	$1.50	$1.99	$1.58[19]

* Costs have been escalated to June 2008 dollars

[14] *Source*: 'Proposed Floor and Ceiling Costs for Mainline, Worsley line and terminal End Bits'. WestNet Rail. August 08

[15] *Source:* '2006-2007 Submission to the Independent Pricing and Regulatory Tribunal in respect of Hunter Valley Regulatory Network' ARTC October 2007

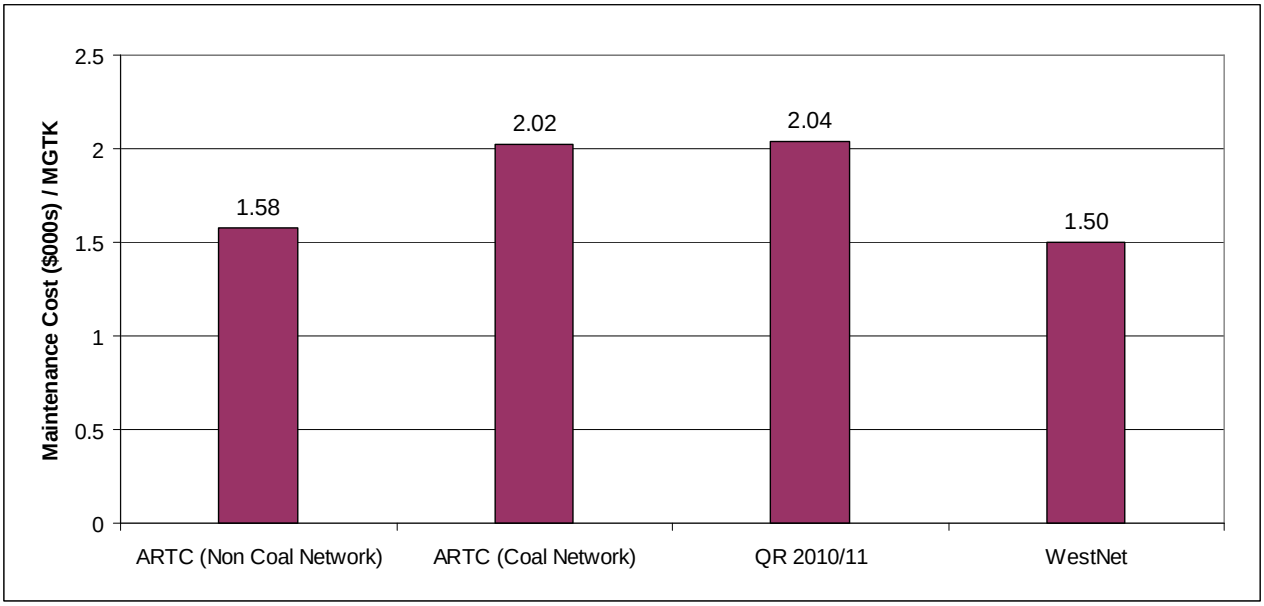
[16] *Source*: 'WestNet Rail – Rail Network Pricing Model – Public'. Economic Regulation Authority. Oct 08

[17] Figure derived from average haul distance and net tonnage. Source: 'The Australian Black Coal Industry Inquiry report – Volume 1: Report' - Productivity Commission 3 July 1998' and ARTC Annual Report 2008.

[18] In June 2009, QR revised its tonnage September 2008 forecasts lower by 19% for 2009/10 without changing its maintenance budget. This has had the effect of increasing the unit maintenance cost in this year but the long term trend remains at approximately $1.80/MGTK.

[19] *Source*: '2006-07 Unit Cost Performance Indicators' ARTC. Dec 2008

Figure 22 Comparison of QR Network, ARTC and WestNet Unit Maintenance Costs ($07/08) (Excluding GAPE)



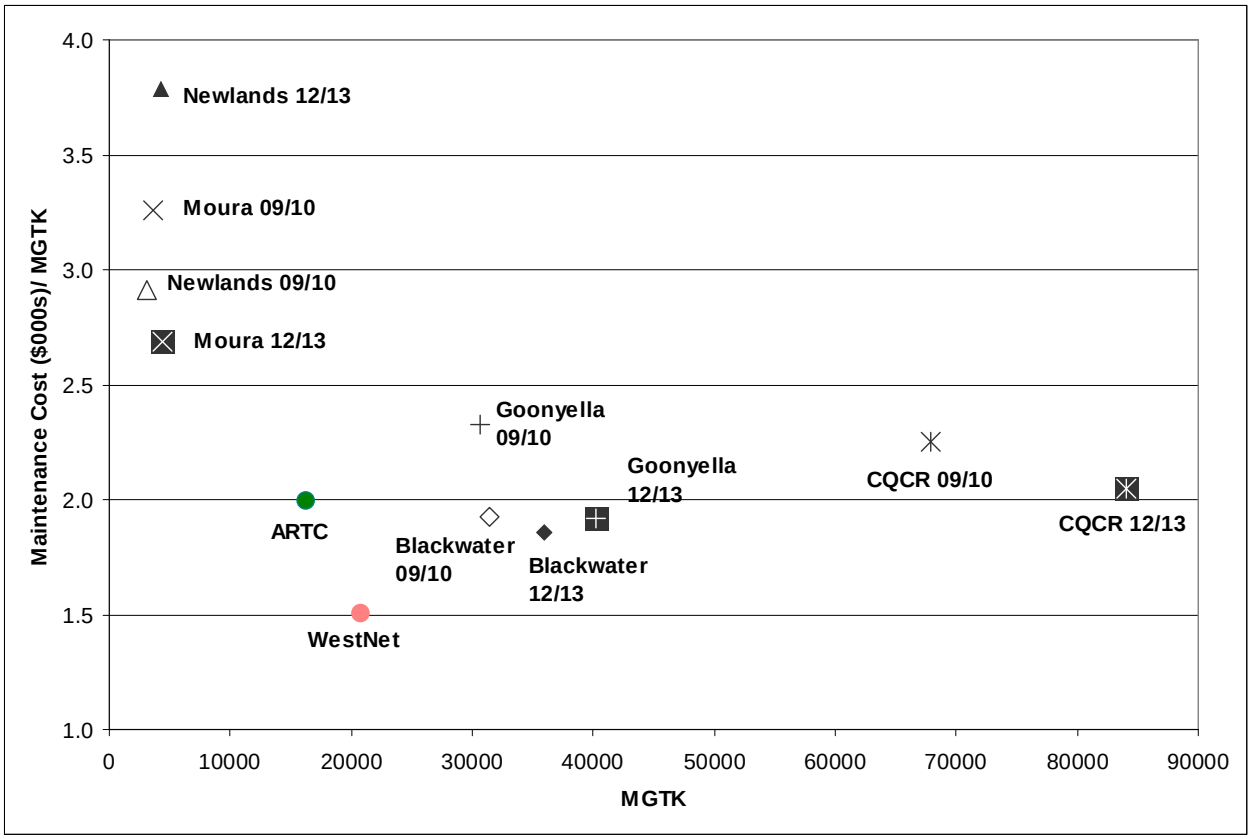
The results reveal a general consistency between the three infrastructure managers. QR Network's unit maintenance cost for 2010/11[20] is essentially the same as that of ARTC's coal network and 30% higher than that of WestNet's. The results are similar given the limitations of benchmarking. We could expect QR's costs to be higher given the inclusion of traction maintenance costs, which account for approximately 6%-7% of total costs although diesel operations imposes its own unique sets of costs also.

QR Network's unit cost is a weighted average of each of its coal systems which vary in size and tonnage, electric and non-electric. A better comparison with ARTC's coal network would be Goonyella which is similar in size and task. (In 2007/08 Goonyella's coal task was 84 million net tonnes and ARTC Hunter Valley's was 96 million net tonnes. The size of Goonyella's system in route distance is 651 km. ARTC's is 311 km).

Figure 23 below shows the unit maintenance costs for each of QR Network's coal systems for both 2009/10 and 2012/13, as well as that for ARTC and WestNet. Again, QR's traction maintenance costs must be taken into account.

[20] 2010/2011 has been chosen for comparison because QR's June 2009 advice about severely reduced tonnage without commensurate reductions in maintenance cost budget make any comparison with 2009/2010 meaningless

Figure 23 Forecast Unit Maintenance Costs for each of QR Network's Coals Systems (2009/10 and 2012/13 excluding GAPE), ARTC's Coal Network and WestNet



It can be seen from Figure 23 that CQCR in 09/10 is not competitive with ARTC or WestNet, primarily because of the lowered tonnage forecasts, but that in 2012/13 it has become competitive. The Moura and Newlands systems remain less competitive and these are a more accurate comparison given the ir diesel operation.

One of the key differences between QR Network, ARTC's and WestNet's rail systems, with the possible exception of the Hunter Valley, is their exposure to fines (such as coal dust or ore dust) and consequently ballast contamination. QR Network, which carries a large volume of traffic, is subject to greater levels of contamination due to its friable coal and as such, has a greater requirement for ballast treatment than either ARTC or WestNet. Ballast treatment includes ballast cleaning, shoulder cleaning and stone blowing.

Figure 24 below shows the relative system sizes of the operators in GTK and ballast treatment expenditure.

As a proportion of GTK, QR Network spends more on ballast treatment than either WestNet or ARTC. Ballast treatment represents a significant percentage of QR Network's budget.

Figure 24 Ballast Treatment Expenditure in the WestNet, ARTC and QR CQCR Networks[21]

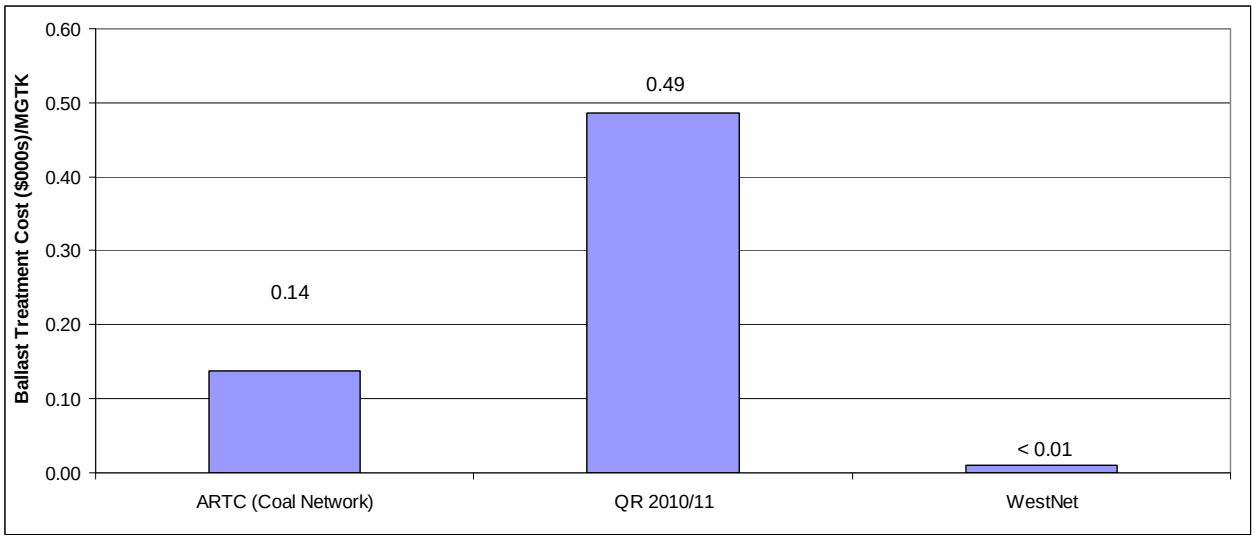


Figure 25 below shows that 23% of QR Network's maintenance budget is expended on ballast treatment. This adds to the unit maintenance cost of the CQCR but should have its benefits in lower routine maintenance.

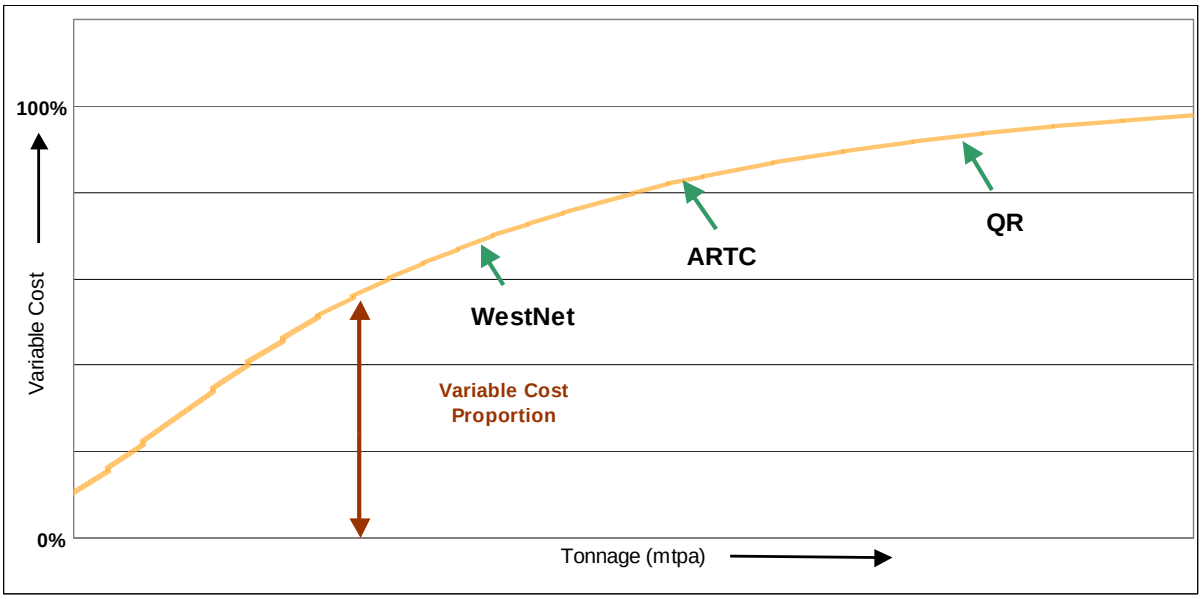
Figure 25 Composition of QR Network's Maintenance Costs (2010/11)

[redacted]

[21] Source: 'Links No.14 November 2006' ARTC.

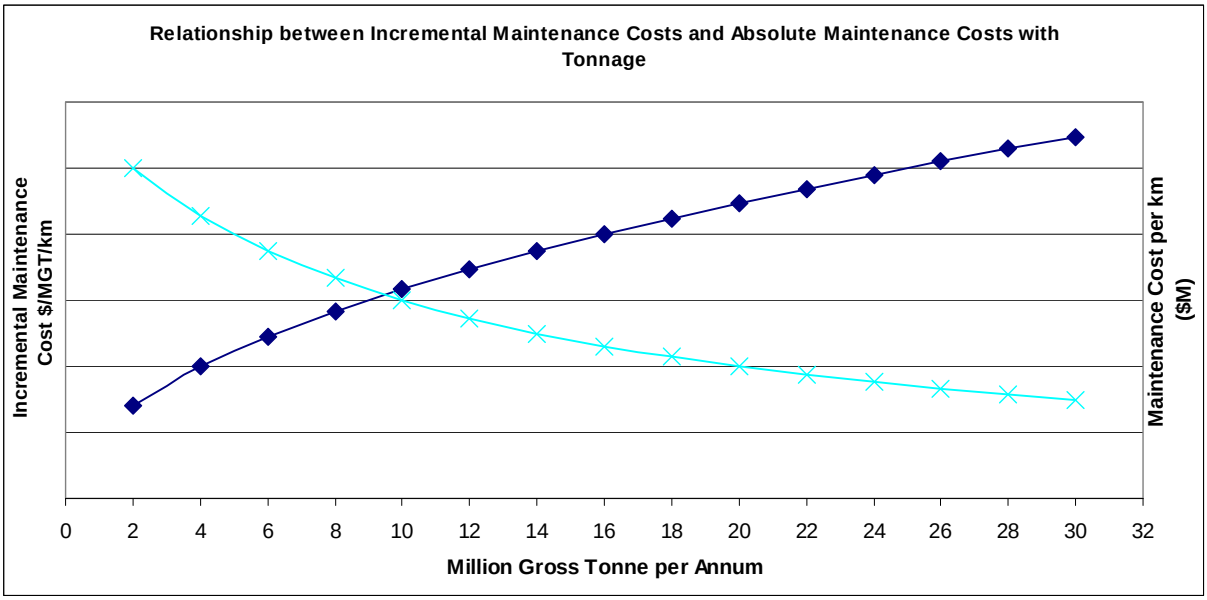
Nevertheless, putting aside the foregoing issues of ballast contamination, we should expect to see some economy in QR Network's unit maintenance cost. As tonnage increases, there is a tendency for unit maintenance costs to reduce. If we examine the ratio of the fixed and variable cost components of maintenance and tonnage, we see a relationship indicated in Figure 26 below.

Figure 26 Relationship between Maintenance Cost and Tonnage



Fixed costs are those costs necessary to maintain the line to a particular standard even if no trains were to operate on the line. Typically these costs include weekly inspections, monitoring and management. The variable cost component is tonnage dependant and includes activities such as rail grinding and ballast cleaning etc. The relationship between variable cost component and tonnage produces the relationship between incremental and absolute maintenance costs and tonnage as shown in Figure 27. It can be seen from Figure 27 that maintenance cost increases at a decreasing rate with increasing tonnage, suggesting a tendency towards economy of scale (by scale we mean traffic volumes).

Figure 27 Relationship between Incremental Maintenance Costs and Absolute Maintenance Costs with Tonnage



Given the scale of QR Network's operations, one would expect to see more economical unit costs. One reason why this is not seen could be the more capacity constrained environment in which QR Network operates and the other environmental factors that add to its maintenance task such as ballast contamination and increased maintenance intensity.

It is evident from the data in Table 7 that QR Network's task and expenditure are considerably higher than either WestNet's or ARTC's. Tonnages in the QR Network are over five times that of WestNet's (see Table 7). This scale of operation produces an environment in which costs rise non-linearly to task. In a busy, capacity constrained system the opportunities for maintenance are fewer and the windows in which to carry it out are more limited. As a result total maintenance costs rise. The impact on infrastructure caused by high volumes of traffic also requires a greater intensity of management and resources. Nevertheless while higher train volumes (though only in a capacity constrained system) lead to increasing maintenance costs, higher tonnages provide an economy of scale which lead to a reduction in unit maintenance cost. The overall "elasticity" of costs could be expected to be less than 1 as that depicted in Working Paper 2[22] although instantaneous jumps may occur as individual steps in capacity are encountered. This relationship is shown in more detail in Section 6.

If we adjust QR Network's maintenance cost for ballast treatment, that is substitute QR Network's ballast treatment expenditure ($0.36/mgtk) with an average of WestNet's and ARTC's expenditure ($0.07/mgtk), we find that QR Network's unit maintenance cost ($1.60/mgtk) is more economical than ARTC's and similar to WestNet's. ($1.89 – $0.36 + $0.142 ÷ 2 = $1.60/mgtk).

5.3.3 Summary

We can conclude from this that QR Network's forecasts are comparable with industry performance although we should see greater efficiency due to increased economies of scale.

[22] Draft Decision, QCA, Dec 2000

5.4 Regional Comparison of QR's Current and Forecast Maintenance Costs

The following review is a comparison of QR Network current and future maintenance costs at a regional level. The review aims to assess the reasonableness of QR Network's maintenance costs by checking the consistency between UT2 and UT3 costs and within the UT3 period.

The CQCR is anticipating a moderate increase in traffic volumes over the course of UT3, not including GAPE. In the final year of UT2 (2008/09) gross tonne kilometres are anticipated to be 78 billion. By the final year of UT3 QR Network is forecasting this to rise to around 84 billion (around an 8% increase) as shown in Figure 28.

Figure 28 Actual and Forecast Gross Tonne-Kilometres for the Coal Region (Excl GAPE)

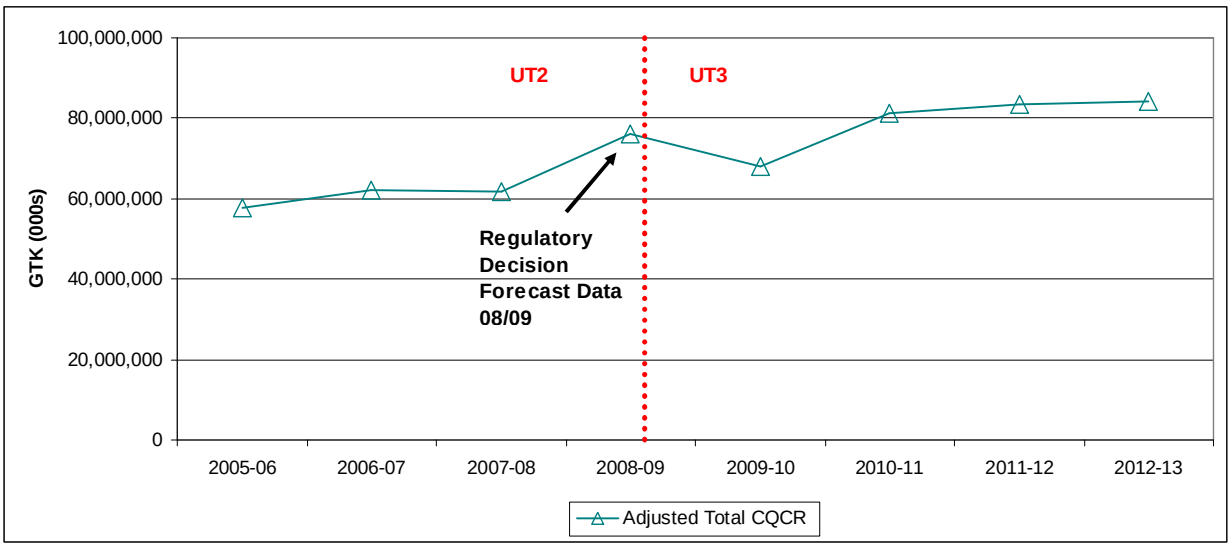


Figure 29 shows that the total maintenance costs forecast for the coal region in 2007/08 dollars.

Figure 29 Forecast Total Maintenance Costs for the Coal Region (2007/08$)

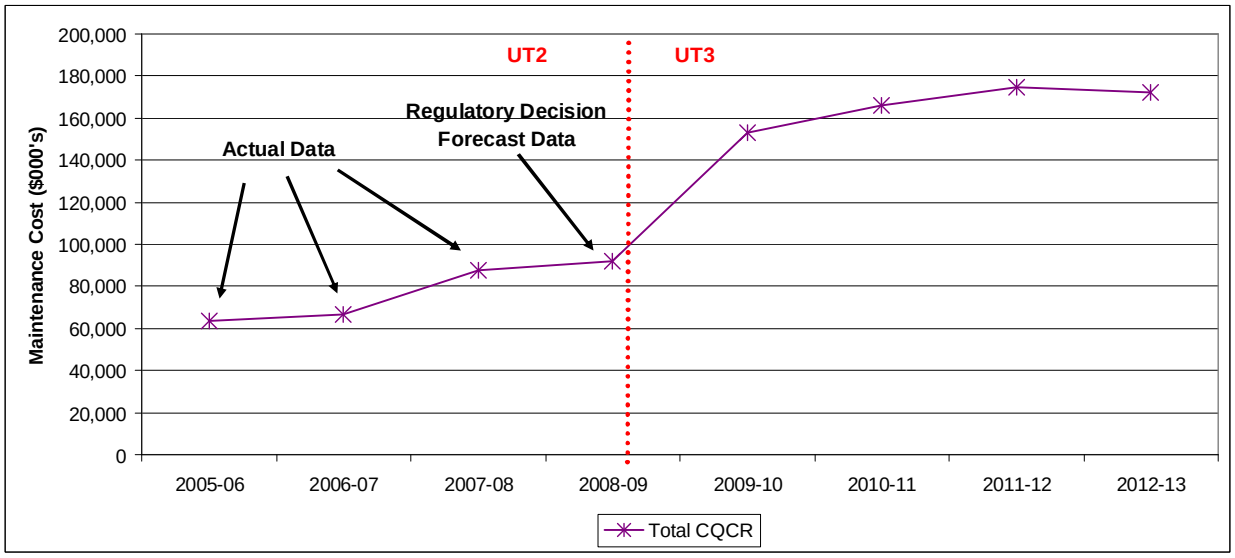
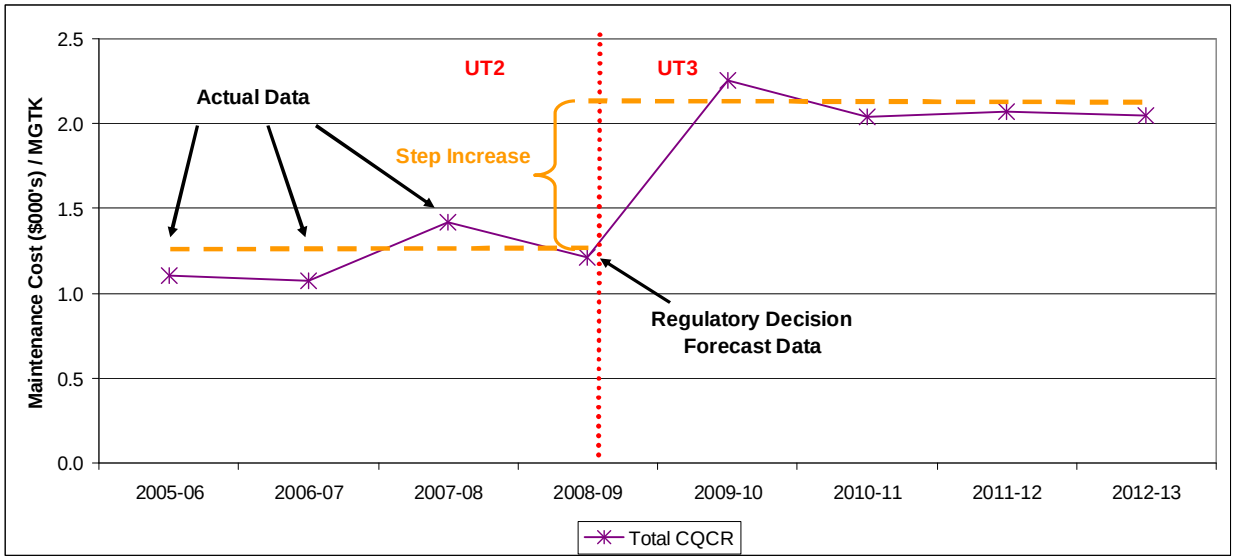


Figure 29 shows that QR Network is forecasting a very significant rise in total maintenance costs in the first year of UT3, from around $90 million to $153 million. The last year of UT2 is the QCA forecast regulatory decision[23]. A comparison of the two results in an increase of around 70%. Yet gross tonne-kilometres (refer to Figure 28 above) and net annual tonnage (refer to Figure 5 on page 15) increase by about 8% and 25% respectively. This increase in maintenance costs appears to be disproportionate to the increase in tonnage. QR Network has given as explanations, an understatement of costs in UT2 as well as the inclusion of equipment capital costs and margin in UT3 as the reasons for this increase. However, such a marked increase exceeds all reasonable expectations of tolerance that one would allow for accounting anomalies and other organisational limitations with respect to record keeping. The 2008/09 value is a historical forecast, as actual data is not yet available for this year. As the 2008/09 forecast was made at the commencement of UT2 and, given that the forecasts for the other years of UT2 underestimated the actual costs, it is likely that the magnitude of the observed increase between UT2 and UT3 will be somewhat smaller (though still large). The fact that QR states that margin and capital charges have now been included in UT3 and were absent from UT2 is somewhat at odds with UT1 estimates indicating allocations of corporate capital costs and equipment lease charges. Nevertheless, it is acknowledged that rises in maintenance costs could be expected for these factors. The acceptability of the magnitude and focus of these costs is discussed in section 6.

The unit maintenance cost (which is the maintenance cost per GTK) for the corresponding period shows a stepped increase at the start of the period, but remains constant over the course of UT3 shown in Figure 30. This apparent step is further analysed and discussed in Section 6.

[23] The word “allowance” is often used by QR as to mean or imply the expenditure “allowed” by QCA. QCA does not “allow” expenditure as such but approves reasonable costs and it remains for QR to expend as it sees fit.

Figure 30 Forecast Unit Maintenance Costs for the Coal Region ($ per MGTK)



The question is whether the predicted jump between UT2 and UT3 is reasonable. On the basis of the comparisons with other below rail operators, QR Network's UT3 maintenance costs seem reasonable, but whether they are the most efficient needs to be examined in further detail. At the high tonnages one would expect to see a much better maintenance cost economy than WestNet or ARTC's non-coal network.

In becoming more of a standalone infrastructure provider, and being organisationally nascent as a separate below rail infrastructure manager, our view is that QR Network is not just capturing but overcompensating for the activities it is being increasingly responsible for. This could be one contributing factor to the substantially large estimate that QR Network is forecasting. Other factors include overcompensation on forecast input costs such as steel prices, labour rates and diesel prices. There is a concern that QR Network might be allowing for an escalation in these inputs beyond normal CPI. This speculative approach may have been an understandable reaction at the time the UT3 submission was written, but now after the global financial crisis the reverse might be true. In fact it is more likely that deflationary forces will be in place during UT3. A detailed analysis of these issues are included in section 6.

5.5 Comparison of QR's Current and Forecast Maintenance Costs at a System Level

The following review compares current and future maintenance costs of the four systems operating within the QR Network. The review aims to check the consistency of maintenance costs in these systems and to detect any anomalies. Similar comment are applicable for this section as in section 5.4 regarding capital costs and margins.

Figure 31 and Figure 32 below show the maintenance cost and unit maintenance cost respectively for each of the coal systems. The unit maintenance cost is a more useful tool for comparing systems. As before, the 2008/09 value is an early forecast made at the commencement of UT2, not an actual value. The inaccuracy of that early forecast explains the dip in the graph. In terms of maintenance, the

Goonyella and Blackwater systems appear to be operating at similar levels of efficiency, although with an increasing unit cost. Moura is around a third the efficiency of Goonyella and Blackwater on a unit cost basis. The relative inefficiency of Moura is to be expected, as the contribution to maintenance from the fixed maintenance component is much greater in a smaller

Of concern is that the unit maintenance cost in all of the systems, rises or stays constant with time. They should fall as the organisation matures and becomes more efficient with continuous improvement; Maintenance costs will fall as maintenance reaches a steady state.

Figure 31 Forecast Total Maintenance Costs by Coal System (2007/08$)

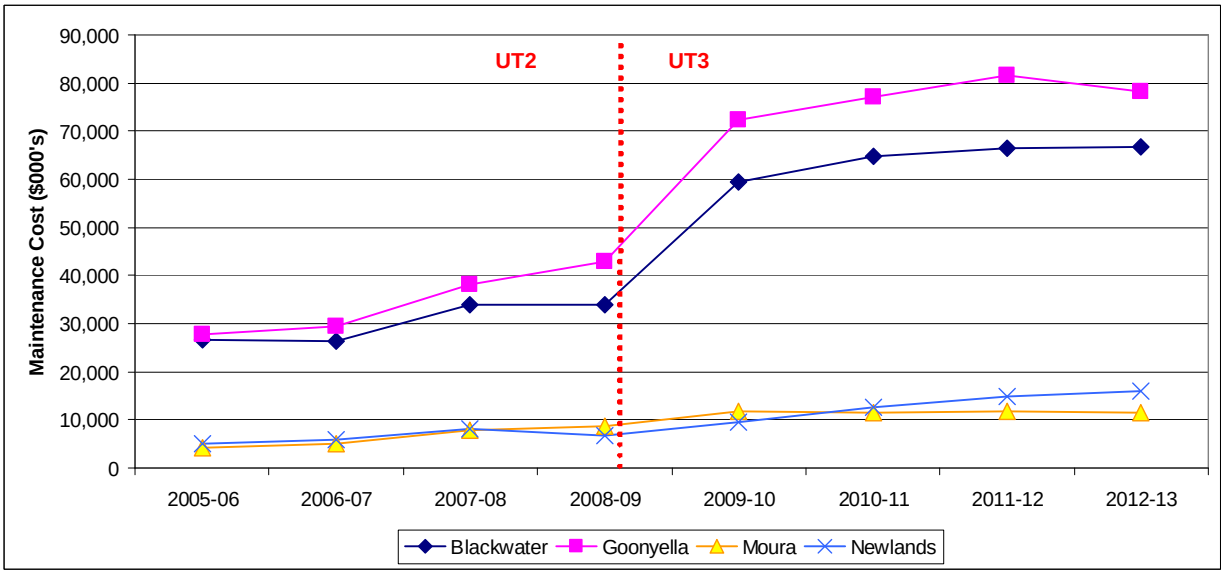


Figure 32 Forecast Unit Maintenance Costs by Coal System ($ per MGTK)

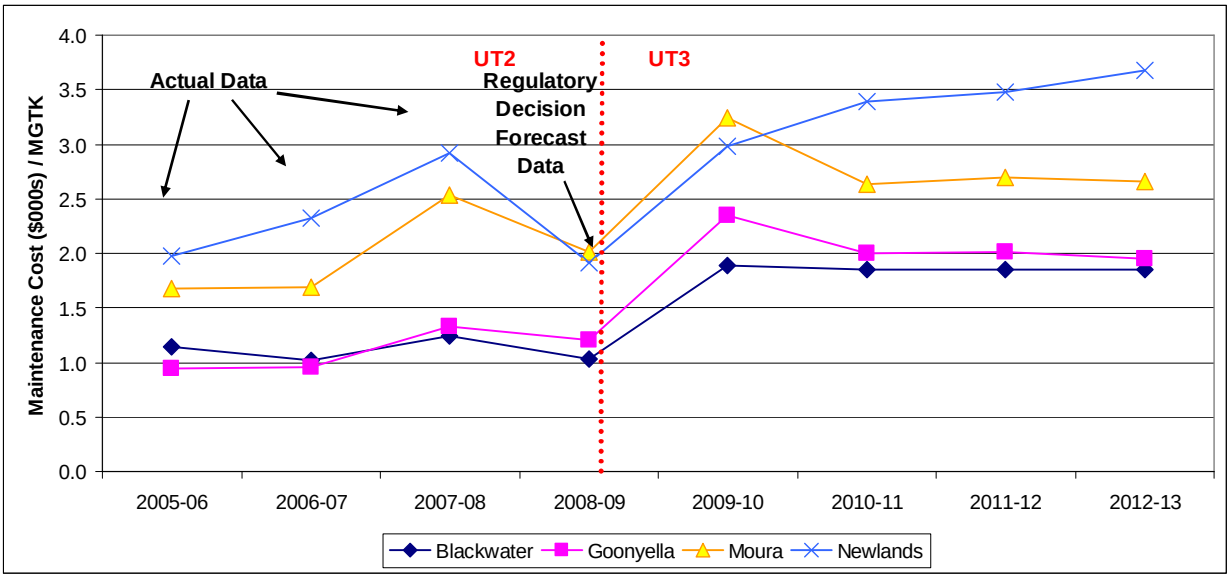


Figure 33 shows the forecast maintenance costs for the coal region by cost category. Figure 34, Figure 35, Figure 36 and Figure 37 show the maintenance cost for each of the systems.

As before, the figure used for 2008/09 is a historical forecast in the absence of an actual value. Given its obvious inaccuracy this value should be ignored.

If we examine the behaviour of the various cost categories we see a consistency with tonnage – the costs rise in step with the rise in tonnage, except for ballast cleaning. The rate of increase in ballast cleaning appears to be much greater than the tonnage volumes would suggest, allowing for necessary adjustment with respect to lag[24]. This supposition assumes that the network is at steady state. The ballast cleaning effort suggests that it is independent of actual demand.

Over a short period, such as the Undertaking period, it is reasonable that ballast treatment work is not in step with tonnage because ballast treatment and its antonym, fouling, have longer term impacts. Ballast treatment should be manifesting after the tonnage. However in QR's Submission it appears that the work is occurring before the tonnage unless the task is actually a catch up for previous periods. QR deny this is the case and suggest that the strategy is to be "on top of" or proactive to the task.

If we look at QR Network's ballast cleaning program we observe that the demand profile is identical to the supply profile - evident by the almost identical levels of ballast cleaning in each year of the UT3. The obvious conclusion is that QR Network does not know with accuracy what its ballast demands should be. QR Network's ballasting staff believe they are in proactive mode but they can't predict with precision when a steady state will be attained. Ballast cleaning represents a significant proportion of QR Network's maintenance budget. It is not likely though that there is a case of over expenditure in this area - possibly even an under expenditure - but what is not known is an accurate picture of the region's ballast cleaning requirements.

It is understood from QR Network that its ballast testing program was briefly suspended in 2003, which may be one reason why this incomplete picture exists. The measurement of voids however is a relatively new initiative. It is not clear from the documentation how precisely ballast treatment effort is being matched to need.

The detail of any likely adjustment is discussed in section 6.

Maintenance capacity set aside, QR Network has indicated that its capacity to carry out maintenance has decreased because it is now more difficult to obtain possessions to carry out maintenance and more expensive to undertake that maintenance because of the shorter windows available. We understand that the way network capacity for coal trains is calculated takes into account an allowance for maintenance, Therefore QR Network's assertion that opportunities for maintenance have decreased are presumably as a result of other pressures and if that is the case QR Network has been compromised in its ability to carry out maintenance. In the long term this is detrimental to the capability of the network.

[24] Ballast cleaning requirements lag 6 to 7 years behind - in the Goonyella system ballast cleaning cycles are around 7 years on average or every 800 million net tonnes

Figure 33 Forecast Total Maintenance Costs for the Total Coal Region by Cost Category (2007/08$)

Figure 34 Forecast Total Maintenance Costs for the Blackwater System by Cost Category (2007/08$)

Figure 35 Forecast Total Maintenance Costs for the Goonyella System by Cost Category (2007/08$)

Figure 36 Forecast Total Maintenance Costs for the Moura System by Cost Category (2007/08$)

Figure 37 Forecast Total Maintenance Costs for the Newlands System by Cost Category (2007/08$)

5.6 Summary

An examination of QR Network's maintenance costs reveals a significant step increase in total and unit maintenance costs between UT2 and UT3 and increasing unit maintenance costs over the course of UT3 in nearly all cost categories.

While the CQCR is anticipating a substantial increase in traffic volumes over the course of UT3, the increase in maintenance costs appears to be disproportionate to the increase in tonnage.

QR Network has listed several factors, which are contributing to the forecast increase in costs. They include:

- An increase in ballast cleaning requirement since UT2;
- More limited opportunities for maintenance on a more capacity constrained system;
- Higher cost of consumables and other inputs
- Inclusion of equipment capital cost
- Inclusion of a margin

Unit costs should remain relatively constant over time, if not to reduce with operational improvement and efficiency in a normal maintenance regime. Yet the opposite is observed in the UT3. This unexpected trend is particularly marked in ballast cleaning which rises more quickly than traffic would seem to require. It is clear from the trend that QR Network's ballast treatment demands do not correlate with traffic. However, QR has clearly identified a new strategy that should provide benefits to routine maintenance and longer term major maintenance and shorter term expenditure can be expected.

Globally, QR Network's unit costs are nevertheless similar to other infrastructure providers within the limitations of benchmarking.

6. Detailed Review of QR Network's Forecast Maintenance Costs

6.1 Double Counting/Misappropriation of Costs

There is considerable potential for misappropriation of costs in the engineering maintenance area and these include activities such as:

- For capital works, where maintenance resources are used for capital works
- For infrastructure that is not Regulated[25] for coal transport such as in above-rail depots, sidings and passenger facilities
- Where management or administrations costs are explicitly and directly expensed to a cost centre but where that resource is included in a System Wide cost centre
- Where the management costs are System Wide and inappropriately allocated to the coal infrastructure

We have examined each area below.

6.1.1 Capital Works

We have observed as part of the review on Operations cost that the safeworking/yard control activity afforded to capital yard works have been expensed into a recurrent budget. We believed this was inappropriate and the activity should have been capitalised.

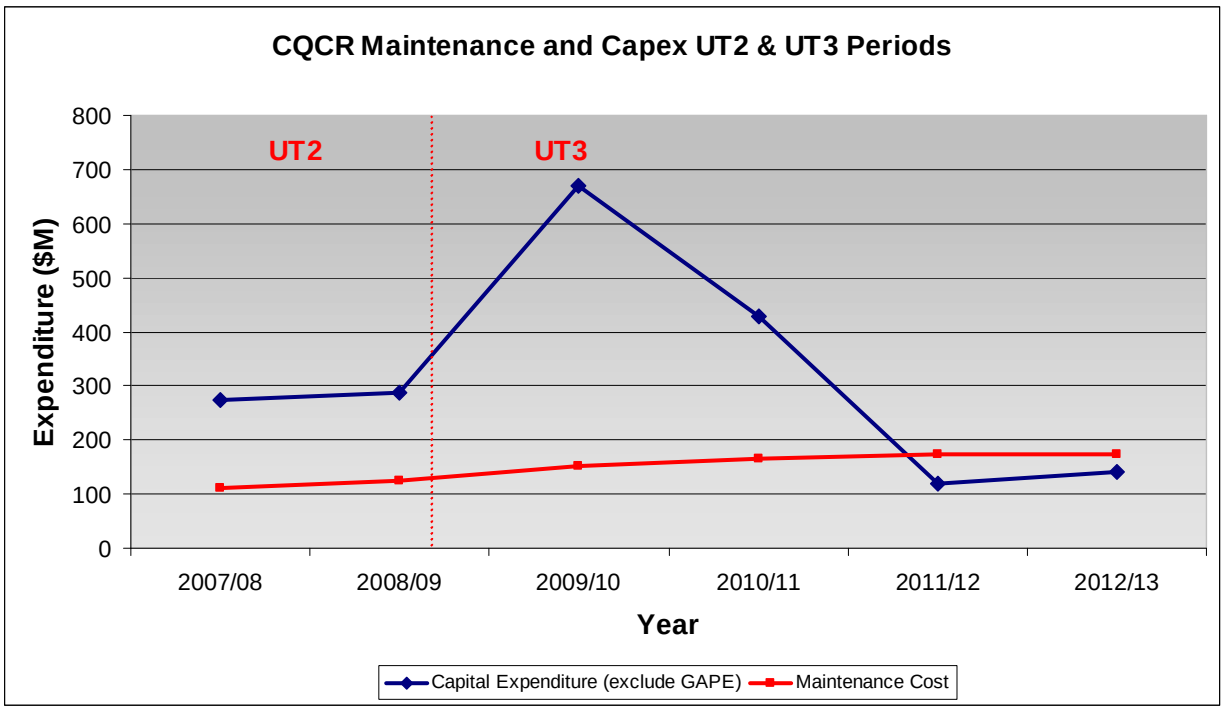
Similar practices can potentially occur in maintenance where maintenance resources "assist" contractors or capital teams to implement the capital works. This affect would manifest by observing an increase or decrease in maintenance expense in concert with capital expense. In Figure 38 we observe a rise in maintenance cost at the same time as a rise in capital expenditure. However the rise in maintenance cost is linked more closely to previously unrecognised costs such as margin and asset charges and new maintenance methods, all of which have no connection with capital cost.

Therefore, we find no evidence of double counting under the influence of capital expenditure. However we do find that with the upgrading works earmarked for the Newlands system and the replacement capital works in other parts of the network, the trend to increasing maintenance costs well above the rate of new track or increased tonnages to be concerning and we have further commented on this trend in section 6.3.

We will also comment on the issue of the margin which has distorted the comparative level of maintenance to capital costs.

[25] The red lines on the system maps

Figure 38 Capital and Maintenance Expense (Excl GAPE)



6.1.2 Maintenance Cost for Above Rail Coal Infrastructure

In this category we would expect to observe adjustments in maintenance costs to reflect the cost of providing services by resources (gangs, equipment) that have as their major activity the maintenance of the Regulated infrastructure. This should be evident because it is most likely the same resource services both sets of infrastructure and is evident in a parallel activity in Operations with Train Control where an adjustment for non-coal traffic is apparent.

However, it is possible that infrastructure workforces use cost centres that are explicitly linked to the infrastructure they work on. Cost centres would need to refer to particular pieces of track.

We have not observed any adjustments in the accounts and therefore conclude that either the adjustments are not made and maintenance costs reflect above rail infrastructure activities or that the separation of above rail infrastructure occurs at a level prior to those provided.

In QR Network's Response 2 it was stated *"QR has been structured to internally separate the business unit responsible for the provision of below rail services (QR Network) from those business units responsible for above rail services, internal services and corporate governance."*

This does not assist in the reconciliation of the use of maintenance resources for the Regulated network because QR's Costing Manual identifies Below Rail activities as those that are infrastructure and not train operations. Therefore the Costing Manual identifies maintenance activities in operators' depots as Below Rail. QR network manages the maintenance of the Above Rail infrastructure but the Costing Manual identifies this infrastructure as Below Rail.

6.1.3 Non-Coal Maintenance

Unlike Train Control costs where an explicit adjustment is shown in the estimates to recognise costs associated with non-coal traffic, no such maintenance cost adjustment is shown in any maintenance estimate.

There are possible cogent reasons for this including that the agreement that QR Network has with QR Services provides that only coal network costs are permitted for coal network accounts.

However, this logic does not explain adjustments that may be required in costs incurred directly by QR Network such as System Wide costs, albeit a concerted effort to restructure for direct costs wherever possible.

One such area of concern is the distribution of the Corporate Overhead and relates to its treatment in the Cost Manual. The Cost Manual was conceived at a time prior to the current restructure and therefore the distribution of Corporate costs is inappropriate to that structure now contemplated. This is because, whereas previously the Corporate area contained a diverse mix of operational, engineering, administrative, managerial and governance resources, many such services are now directly responsible. In particular the operational and engineering services dealing with planning, assessment and analysis is now performed “in-house” and the more general administrative and governance area remains.

We believe those remaining areas will have far greater focus on passenger and legal issues and therefore the apportionment currently contemplated by the Costing Manual is inappropriate. In fact Network Access now has its own “Corporate” functions” that are being charged as direct costs and have been one of the sources of QR’s explanations for increased costs.

6.2 Proposed Unit Rates

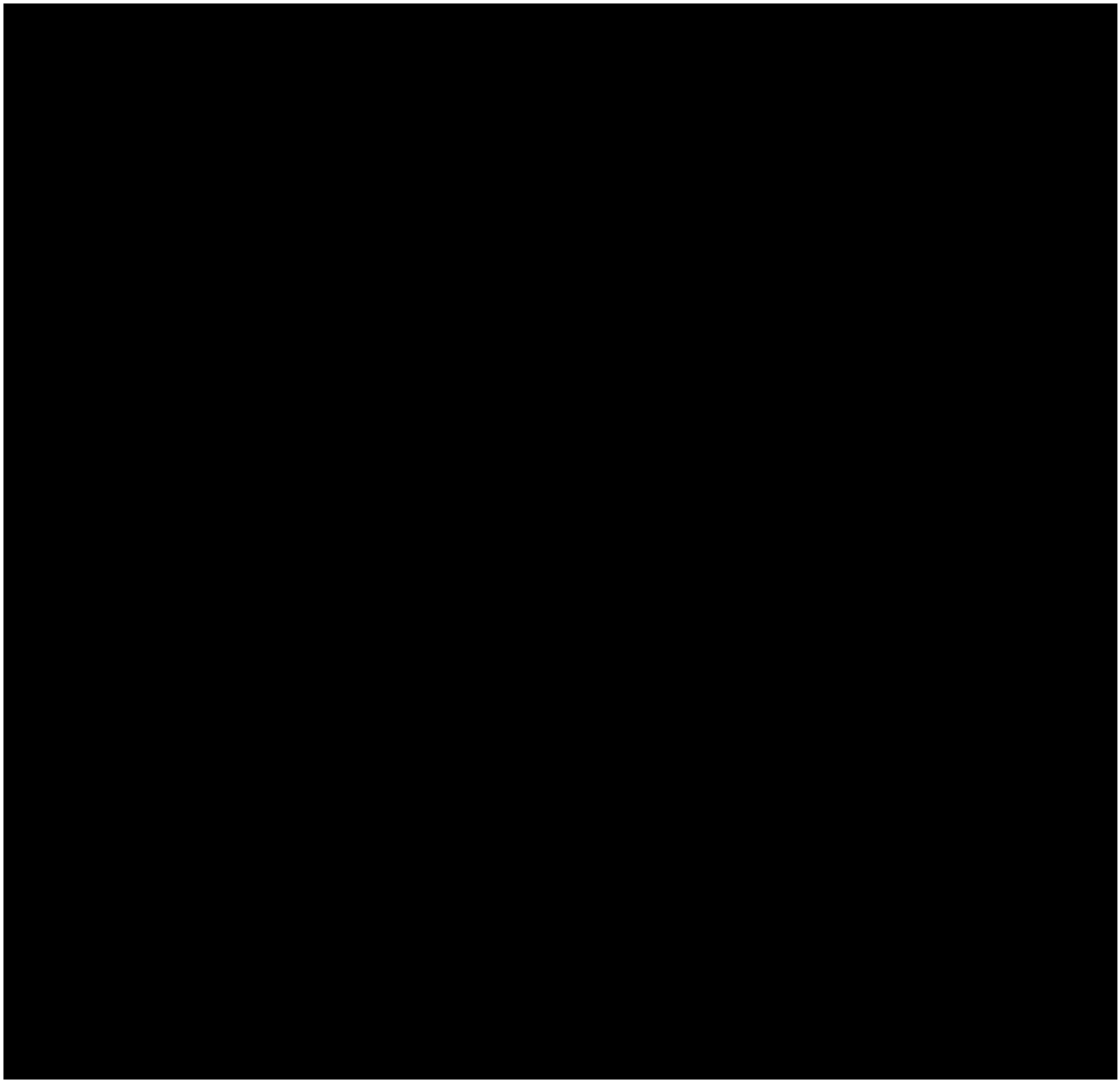
We note a general direction in QR’s Submission to increase or stagnate unit rates throughout the period of UT3.

For example there is an explicit reference to a 4% increase in labour costs (before escalation) for the Track and Structures workforce in section 6.2.4 of QR’s Submission. This estimated increase in labour costs is suggested by QR in the context of the aforementioned increase in labour costs generally in the Queensland economy.

We also note that other areas of the maintenance costs attract a rising or flattened unit rate and these are summarised in Table 8. We have used the 2010/2011 year as a base since with QR’s recent decrease in task for 2009/2010 without any change in maintenance cost forecast, any contrast with 2009/2010 would provide an unrealistic comparison.

We therefore propose adjustments to the maintenance costs on the basis that there is no evidence to suggest that the real cost of labour will continue to increase, although it may have in the past, and other adjustments will be suggested for the other components. This is shown in Table 9.

Table 8 Unit Rate Rises for Maintenance ($07/08) (GAPE Included)



It is not the purpose of this analysis to necessarily investigate the detailed bottom-up derivation of QR's budget, but in the context of ascertaining whether any double counting or inappropriate allocations have been made we observe that unit cost is not demonstratively improving during the UT3 period. With the large amounts of ballast treatment we could expect to see improvements in other unit costs.

[26] Prior to escalation, constant dollars

Therefore we ask whether the individual activity budgets have been generated in absence of other activity budgets and this comment applies to the planned upgrade works and on-going capital replacement works that should provide the system with stable steady state maintenance budgets. We will propose that routine maintenance budgets should decrease toward the end of the Undertaking Period as the impact of greater amounts of ballast treatment start to take effect.

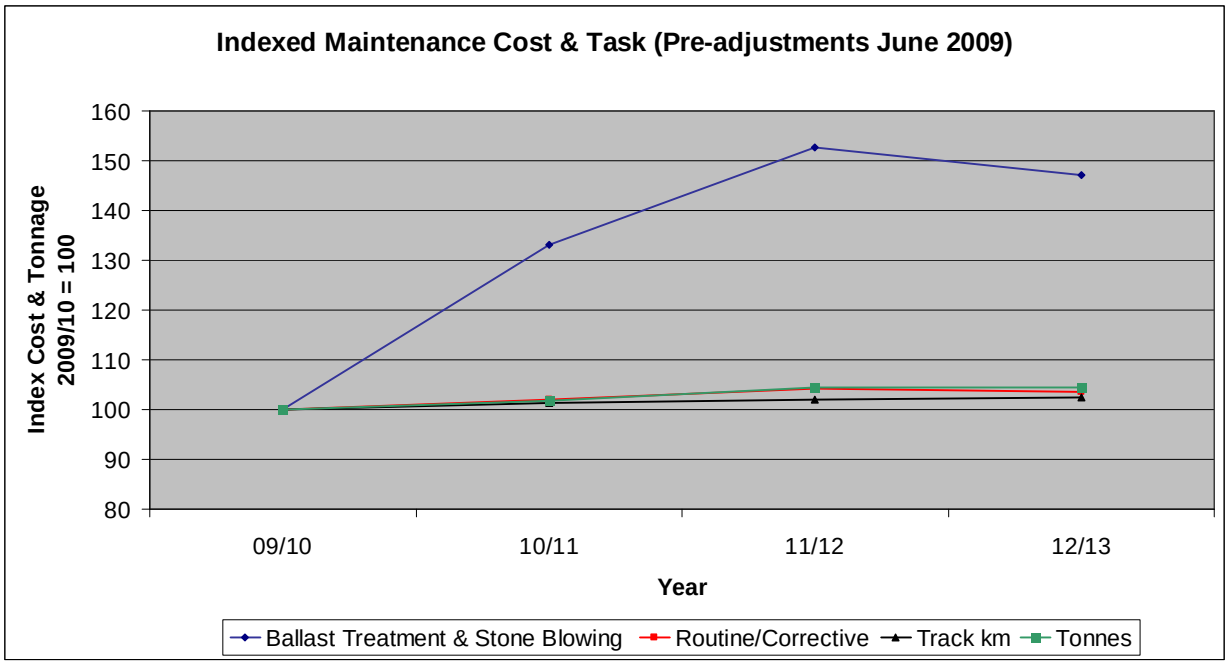
6.3 Forecast *Level* of Maintenance

The main area of focus in our analysis and the area to which QR has concentrated its explanation are in Ballast Treatment, which includes ballast cleaning, shoulder cleaning and stone blowing.

Our main area of comment relates to the fact that despite a substantial increase in ballast treatment scope and cost as well as the newly introduced stone blowing there is little to no reduction in any other area of maintenance including Routine Maintenance by track gangs or in Corrective maintenance such as resurfacing or rail grinding[27]. Figure 39 shows how Corrective Maintenance continues to rise while ballast treatment rises rapidly in the context of small to modest increases in tonnage (excluding GAPE) and track length. In terms of track length, the new track to be constructed has little impact on maintenance in the early part of its life.

In this analysis we have used the original tonnage forecasts and matched them to QR's budget forecasts[28] ($07/08 excluding GAPE) to provide a comparable assessment

Figure 39 Maintenance Cost & Task



Source: UT3MCS, UT3, Response 2, and Tables in sections 2.1 and 2.2, Response 1.

[27] One could expect some improvement in resurfacing and rail grinding at a point into the future after extensive ballast cleaning has occurred because the response to loads would be more uniform and less differential settlement would occur and better track geometry further resulting in better rail profile retention

[28] QR did not adjust its maintenance budget with the lowering of its tonnage forecast in June 2009.

Despite QR's copious explanation of the derivation of the ballast treatment estimates we regard the trend of expenditure for the Routine Maintenance as pessimistic, especially the need to continue to increase Routine Maintenance at the rate shown. QR's Submission has not addressed the requirements for Routine Maintenance is the context of capital works and enlarged ballast treatment scopes. The cost increases in Routine Maintenance is in part due to QR's estimate that unit labour costs have been assumed to rise at 4%[29] (above real) and other factors discussed in Table 8.

We note in 6.5.1 of Appendix G, Submission, three of the four options for ballast cleaning considered are unviable leaving a single preferred option. Table 6.41 details the ballast treatment and increase in scope during the UT3 period, so increased costs are not only associated with the purchase of support equipment for the current ballast cleaning activity.

Other factors that need to be considered include the planned capital upgrade works on the Newlands system, in addition to the new track, as part of the GAPE works and the on going capital replacement works such as rerailing.

QR has maintained that the ballast condition is not in deficit[30] within the limits of accuracy of understanding the ballast condition. This begs the question as to on what basis a substantial increase in ballast treatment could be justified if no other maintenance parameter benefit? While some of the expenditure relates to asset charges for support equipment for ballast cleaning, other new initiatives include stone blowing and ballast shoulder cleaning.

We also note QR's initiative to use increased track recording with stated[31] benefits such as:

- reduction in the exposure profile for staff under QR's Zero Harm philosophy;
- potential savings in the cost of track maintenance through more timely
- intervention;
- reduced impact on above-rail operations by more efficient work practices;
- reduced requirements for train paths for inspection requirements;
- improved proactive and predictive planning tools;
- improved integrated planning;
- improved data quality, integration, and availability to value-add to the decision processes for business and strategic planning.

So, while inspection costs, ballast treatment and rail grinding costs are increasing at rates above those of tonnage increases, also too is routine maintenance and resurfacing.

We find this proposition incongruous and we recommend adjustments to routine and corrective maintenance costs and are detailed in section 6.8.

[29] Appendix G 6.2.4, and there are other references to escalation that would imply this factor is in addition to escalation.
[30] Steady state basis, discussions at Mackay, Dec 2008
[31] Appendix G – Report by QR Network on its Maintenance Costs

6.4 Above Rail Factors

We noted in Figure 5 that over the course of UT3 tonnages increase.

In order for the maintenance program to be compiled QR have had to make an assumption about the number of and timing of track possessions that will be available to it for major work. This is a sensible approach because it firmly places expectations on the operators and permits long term programming and resource allocation. We endorse this approach.

In Table 4.6 of Appendix G of QR's Submission, the possession requirement for each maintenance activity is detailed. These appear to be reasonable requirements and the subsequent resourcing follows as a logical calculation.

We are also aware[32] of the process required in the planning of possessions with long lead times and frequent iteration key aspects of the process.

This rigour appears to have been missing in the past[33], at least in its execution as many such possessions have been put aside due to the pressures of operators required to meet port demands.

QR Network's Submission[34] makes in plain that it is at the bottom of the food chain in relation to the operation of the coal supply chain in that it "cannot impose obligations on other supply chain participants". However there does appear to be a genuine attempt by all participants to optimise the chain without compromising the maintenance work required.

The main issue to be confronted then is whether QR Network is able to assert its maintenance program to a degree that prevents long term degradation of the infrastructure; there will always be "emergency" operational requirements. Judged by the increase in ballast treatment proposed during the term of UT3 it would appear that degradation has in fact occurred during UT1 and UT2 but that now a more scientific approach[35] is driving to program of rectification.

In relation to above-rail behaviour and coal contamination, the Submission offers no initiative with regard to the future prevention of amelioration of ballast fouling. The reader is forced to assume that it is in every stakeholder's interest that fouling continues and ballast treatment continues to raise in scope, cost and possession requirements within and beyond this Undertaking Period. We are not of that opinion and we recommend QR present a justification for its inaction in not influencing the above rail stakeholders to cease the practice of overloading and over-dumping[36] coal in the wagons.

6.5 Under or Over Performance Since 2001

In considering whether QR have under or over performed in their maintenance role since 2001, only indirect evidence is available to form a view. The following evidence is offered in that review:

- A considerable change in strategy has occurred in relation to the way planned maintenance is programmed in UT3 compared to earlier years. Whereas QR went through a period of "chase tamping" in response to the decreasing availability of maintenance periods, it is now calculating

[32] Site inspection Mackay Train Control Dec 2008
[33] Submission Appendix G, p 8
[34] Submission, Appendix G, section 3.1.1
[35] The use of Percentage Void Contamination (PVC) testing
[36] This is the practice of bottom dumping coal at a faster rate than it is taken away at the dump station causing coal to build up on the bogie

shift numbers and resource allocation and attempting to be on the "front foot" in relation to its role as the last in a coal supply chain.

- In UT3 QR is proposing new methods of resurfacing and ballast treatment as well as new methods of rail grinding, involving the purchase of new machines.
- In "forecasting" maintenance cost movements QR is now proposing a new method of cost indexing and responsiveness to input cost conditions, after showing cost deficits in maintenance during UT2 where cost pressures must have detracted from optimal practices.
- In UT3 new inspection methods are being proposed for track geometry and ballast contamination.
- The O'Donnell Report[37] did not identify the rail infrastructure as a principle cause of the so-called bottleneck in the coal supply chain, indicating that the infrastructure must have been in reasonable condition during the mid to late 2000's.
- QR Network has employed world-renowned expertise[38] to reshape its maintenance program and received many other advices[39] during the course of the process.
- The expanded scope in ballast treatment, now a combination of shoulder cleaning, undercutting, stone blowing and resurfacing, would point to the need to at least "ramp up" to a higher level of input or perhaps to ensure that it does not fall into deficit as it may have once teetered on the brink.

This evidence points to an organisation "just hanging on" during a tumultuous time where the pressures of cost control and increased tonnages were pulling at stretched resources.

We now observe that QR is to apply every tool available, some untested in these conditions, in a somewhat experimental phase.

Despite this, it is also apparent that these initiatives could have been taken earlier and with the proper justification would have been supported by all parties. The fact that the maintenance services remained "in-house" detracted from possible external advice that some initiatives were available many years prior. For example, one-pass grinding was introduced into North America during the 1990's; ballast void contamination measures were known at least in 1992[40] and stone blowing was used in UK in the 1980's.

The fact that cost records over the last 10 years have been unreliable as evidenced in the Submission and that the actual condition of the ballast has not been known, as evidenced by the initiative to measure contamination for the first time, a judgement about QR's performance is not possible, especially in ballast maintenance.

This situation should not be permitted to continue and we recommend that QR be required to report input and output measures related to individual activities as well as overall performance of the infrastructure. Measures to be reported publicly include:

- The impact of speed restrictions on sectional running times and transit times
- Kilometres of completed work and the costs in the activities of ballast cleaning, stone blowing, shoulder cleaning and resurfacing

[37] Letter, Stephen O'Donnell to Mr Michael Roche, Queensland Resources Council and Mr Bruce Wilson, Queensland Transport, 29th July 2007

[38] TTCI United States and WorleyParsons

[39] KPMG on operator margin, BOOZ on cost inputs

[40] QR quoted text "E T Selig & J M Waters (1992)."

- Details of the unplanned events such as speed restrictions applied at short notice, unplanned track closures

6.6 Long Term Sustainability

QR's proposed UT3 maintenance budget represents a significant increase in maintenance activity, utilising modern machinery and modern methods.

There is no reason to believe that the proposed strategy will do nothing other than to "*ensuring that at the end of the Term, the Assets are in a condition at least as good as that at the Commencement Date unless otherwise agreed by the Alliance Management Team (AMT)*", as indicated in Appendix G of the Submission.

Given the proposed program of works we believe the asset will be in better condition that at the start of UT3. The only issue then is whether its condition is better than required. This clearly is not in the minds of QR who are looking to recover the initiative and ensure that the infrastructure condition is able to meet its role in the coal supply chain.

We note that the asset lives assumed for the equipment is approximately 10 years, which is well past the period of UT3. This is a reasonable asset life, at least before it may require a major overhaul, and therefore will be in a condition to enable an equally rigorous maintenance program in UT4.

6.7 Productivity Forecasts

6.7.1 Background

[redacted]

[41] Previously rolled up into activity costs as in Figure 25

Figure 40 Maintenance Cost Distribution

6.7.2 Margin

[42] ARTC and WestNet, the largest users of maintenance contractor services in Australia, purchase materials and free issue them to the contractors. Minor materials and consumables for personal use by the contractors' labour is purchased by the contractor.

[redacted]

6.7.3 Asset Charges

The transparency offered by an Asset Charge is to be applauded, primarily because this component had never been visible in previous submissions. It is surprising however that previous estimates did not include sufficient allowance for these costs.

Nevertheless, we find that QR's approach to this is reasonable in that a realistic life of asset is calculated to be approximately [redacted] years for the purposes of write down. We note that for some assets, such as the spoil wagons this period may not reflect the physical life of the asset but rather the life of a services agreement with QR Services and the on-going need for the asset given fluctuations in ballast condition and tonnage task.

[redacted]

6.7.4 Productivity and Efficiency Gains

We note in section 3.1.2 of Appendix G of the Submission that the maintenance Alliance will amongst other things give " *(b) an ongoing optimisation of maintenance effort, continuous productivity improvements and the achievement of efficient cost*".

We observed in section 6.2 of this report some evidence of continuous rises in unit rates in the face of the purchase of machinery and expanded restoration program. Some of the rise can be explained by the purchase cost of the machinery but we ask whether the machinery should not be producing productivity benefits and if not whether the difficulty of carry out maintenance in that environment justifies the expenditure.

Overall we are disappointed with the apparent lack of productivity benefit given the Alliance, the continuous improvement culture, the new machinery and the apparent realisation by the Operators that maintenance is essential for a reliable infrastructure.

In section 2.2.3 of the Submission QR puts its case for a new method of cost indexing "*Going forward, it remains difficult to forecast the expected growth in maintenance costs, as the key cost components have been increasing well in excess of the CPI. QR Network is therefore proposing to index these costs based on a Maintenance Cost Index (MCI)*" Our view is that this is a reasonable approach because the elements of railway maintenance are not well covered in a retail CPI.

However, coupled with this approach, if the MCI is able to capture input cost increases, there should be a productivity incentive. That is an MCI-X format.

Unlike the Operations cost approach in regard productivity, the maintenance costs proposal is not suggesting an "efficiency dividend". Instead QR has submitted at 10.1 of the Submission,

> "*a number of efficency*[43] *measures were also built into the cost forecasts. These include:*
>
> > *7. a reduction of 9% in forecast consumption of indirect consumables over the four years of the undertaking;*
> >
> > *8. a reduction of 9% in the forecast amount of overtime booked by the resurfacing crews over the four years of the undertaking;*
> >
> > *9. a reduction of 9% in the forecast cost of plant maintenance for the ballast undercutter and resurfacing operations over the four years of the undertaking.*
>
> *Each of these reductions were applied assuming no change from forecast in year 1, a 3% reduction in year 2, 6% reduction in year 3 and 9% in year 4*".

Taken solely these are laudable targets but they beg questions about whether they result in overall reductions. For example:

- If "*The major indirect consumables are fuel for vehicles and the repair and maintenance of vehicles which together these account for just over* [redacted] *of the total budget. The other components are typically associated with staff requirement such as uniforms, training, travel expenses etc*"[44], which elements are proposed for reduction? If fuel is to be targeted, is that associated with better planning or more fuel efficient vehicles or both and will the reduction in travel result in increases in possession costs or other larger equipment?

[43] Submission spelling
[44] 6.2.6 Appendix G, Submission

- If overtime is to be reduced will that require larger and more expensive machines to be deployed to effect on-going production rates during normal working hours? There is evidence in QR's Submission that this is occurring.
- The reductions in plant maintenance will presumably occur because newer equipment is being purchased. Has an evaluation of plant maintenance costs versus new equipment costs been made?

Therefore it is unclear as to whether the total input cost to output production (multi-factor productivity) has indeed improved. Referring to Figure 39 where all costs appear to be rising and Table 8 where many unit rates are stagnant during the UT3 period, it is not obvious that QR's productivity is improving.

Therefore, if an MCI[45] is to be adopted we suggest a productivity factor X be applied to provide incentive for productivity improvement.

We are also concerned with the justification strategy for the rollingstock and support equipment for the ballast cleaning activity. The justification lists three options that are not viable and relies on a default position that only one option is viable and therefore is the favoured strategy. This means QR was not able to think of any other viable options, which is concerning. This is the pattern that has reinforced the culture that internal resourcing has been the only "viable" alternative in the past and why when WorleyParsons and others is asked to provide its expertise, new strategies are evolved.

Therefore we find there is little forecast by QR of productivity improvement and that incentives may need to be applied through an MCI-X type mechanism. The appropriate value of X is that indicated in section 4.4, 25% of MCI to result in 75% of MCI.

[45] The MCI proposed by QR has received separate comment by QCA

6.8 Recommended Adjustments

We observed incongruence in the scope and cost of maintenance proposed in:

- Unit rates;
- Increased costs in MPM without reductions in RM, and
- Margin

previously in this Section and we have detailed our adjustment in Table 9 using QR's table of Total Maintenance Cost[46] and provided our comments.

The adjustments essentially endorse QR's Major Program Maintenance but adjust Routine Maintenance(RM) and Margin for expected benefits due to the enhanced MPM program. No adjustment is proposed for Trackside Systems or Traction because no large increase in MPM is proposed.

The adjustment recognises that QR's Submission is based on a bottom up approach, that the asset charges appear reasonable and that new initiatives have been introduced into MPM activities, but that the expectation that labour costs would "automatically" increase by 4% per year[47], and that a Margin and RM activities would continue to increase in the face of rapidly rising MPM costs, is not reasonable.

The recommendations provided in Table 9 are those applicable to the adjusted task, lower tonnages, as provided to the QCA in June 2009.

[46] Table of Total Maintenance Cost, page 5, Appendix G – Report of QR Network on its Maintenance Cost

[47] We note QR only explicitly indicate this increase for Track & Structures and so have only made any adjustment to this activity.

Table 9 Recommended Adjustments to QR's Maintenance Costs ($m 2007/08)

#	Origin	Item	2009/10	2010/11	2011/12	2012/13
[redacted]						
13	QR	Total Proposed	152.80	166.07	174.79	172.34
[redacted]						
19	GHD Applied	Add items 13, 15, 16, 17, 18	136.06	146.27	152.43	150.38

Notes: "QR" means QR's Submission and Further Unescalated Cost Advice, "GHD Calculation" means a calculation performed by GHD using information in QR's Submission, "GHD" Applied means the application of the rationale provided in this section.

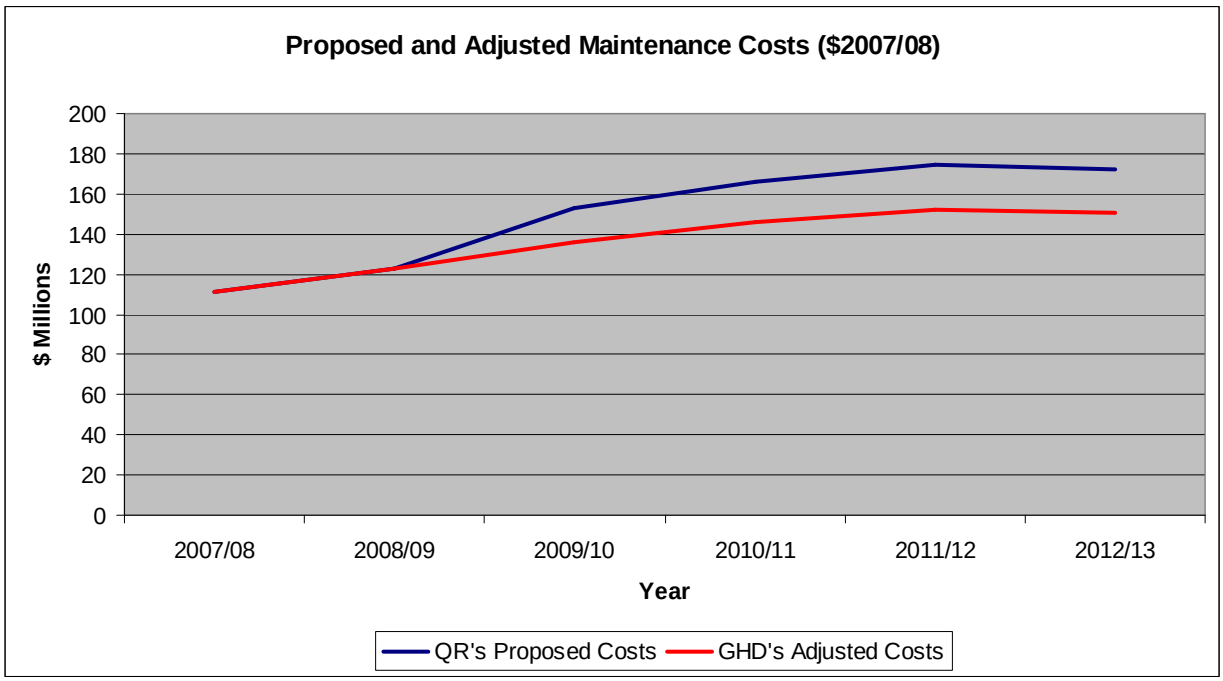
In Item 14, each element of direct labour provided in QR's Submission has been summed.

In Item 15, the 4% "automatic" labour cost increase included by QR has been eliminated after 2009/10. QR's Submission only makes reference to Track & Structures being affected in this way and therefore only Track & Structures has been adjusted.

In Item 16, the Track & Structures Routine Maintenance has been held constant after 2009/10 in light of the considerable increase in MPM, but has been increased on the basis of the ratio of track km increase over the remainder of the period.

The combined effect of GHD's adjustment is shown in Figure 41.

Figure 41 QR's Proposed and GHD's Adjusted Maintenance Costs (Excl GAPE)



7. Incremental Maintenance

7.1 AT_1 Reference Tariff Background

The proposed Reference Tariff component AT1 is in Table 10 and represents the incremental cost of providing maintenance.

Table 10 AT_1 Proposed Tariff

	2009-10	2010-11	2011-12	2012-13
Blackwater	0.54	0.55	0.57	0.58
Goonyella	0.54	0.55	0.57	0.58
Moura	0.95	0.97	1.00	1.03
Newlands	0.78	0.80	0.82	0.84

QR has provided the rationale for this proposal outlined in section 7.2 below.

7.2 Methodology

QR's methodology for UT3 is *"it is proposed to roll the current AT_1 components forward by applying the MCI, and, where appropriate, adjusting the resulting AT_1 to reflect significant changes in volume for each system since AT_1 was originally set"*.

Specifically, it is proposed to:

- *Set the Blackwater and Goonyella tariffs at the rolled forward Goonyella AT1 rate on the basis that:*
  - *they are both forecast to have average gross tonnes per kilometre (km) (refer Figure 6.1) which are well beyond the bounds of the analysis presented in Working Paper 2 and therefore close to the asymptotic point of the exponential curve[48]; and*
  - *input costs have continued to increase above CPI since the maintenance cost submission in September 2007.*
- *Set the Newlands AT_1 tariff at the rolled forward Blackwater tariff on the basis that the average gross tonnes per km in UT3 will rise to a level similar to that of Blackwater in UT_1.*
- *Adjust the Moura AT_1 tariff based on the relationship between the AT_1 tariffs and average gross tonnes per km defined in the original QCA Working Paper.*

7.3 Assessment

It is relevant to recount the origins of the incremental cost functions derived in Working Paper 2. They were primarily the regression of existing QR data and is embodied in the title of Figure 5.1 of that Paper, *"Incremental Cost Functions for Infrastructure Maintenance Derived from Various Regressions of QR Data".*

[48] *This means the point on the curve where costs 'flatten out', or, where any further increases in volumes do not result in any further reductions in average costs.*

Almost one decade later we now know that QR did not know the cost of its maintenance and we know that the activity components of the maintenance task has altered. In particular, the characteristics of the maintenance task is now one involving large machinery with more time dependent expenditure.

A much higher fixed component of maintenance, mainly driven by the need to apply ballast treatment at a rate that is characterised by a long term cycle, certainly greater than Undertaking periods. If the task was to halve immediately the ballast cleaning task would not diminish for some years, except for the ability then to make use of larger possession times for corrective maintenance involving the less expensive resurfacing strategy.

Nor is there any change in inspections and corridor maintenance.

One pass grinding cycles are relatively stagnant with small changes in task, as the large equipment needed requires longer term programming.

In fact the movement to more capital intensive maintenance methods, driven by shorter possession periods, has resulted in asset charges being a larger component of the maintenance cost, even if they had been properly identified in the past. These are time related charges.

Overall therefore, we could expect a flatter maintenance cost profile with tonnage. However, as the analysis in section 7.4 suggests, this characteristic is not apparent because of the considerable ramp up of costs while the new strategies are being implemented. This flatter profile of cost increases could be expected toward the latter part of the period and into UT4.

7.4 Regression of the Proposed Maintenance Costs

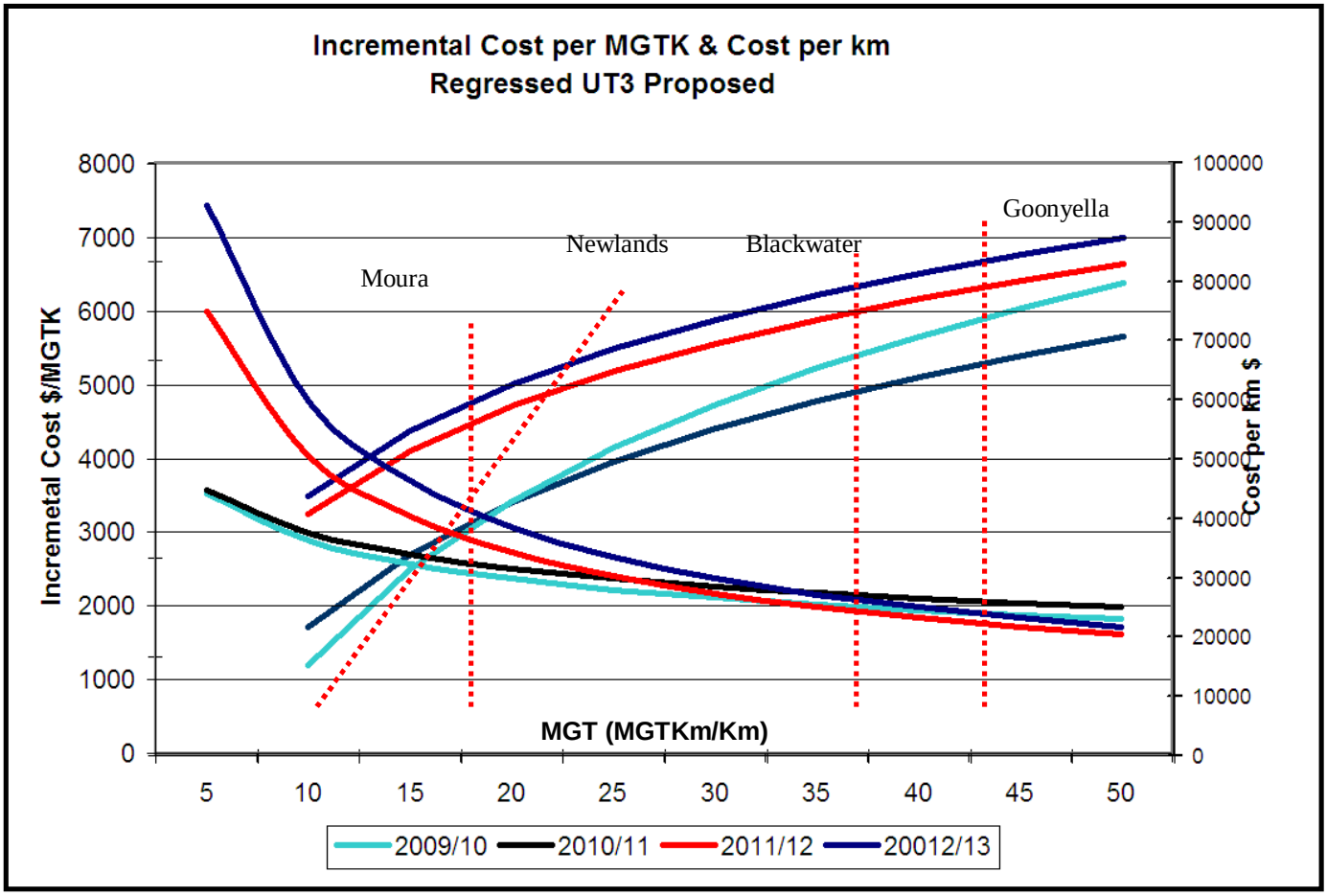
In Figure 42 we have regressed the total maintenance cost proposed for each year of UT3. The regression shows:

- the typical reduction in incremental unit cost per gross tonne kilometre and the increase in cost per km with increasing task.
- Increasing cost per km with time, which corresponds to the increasing task during the period
- Decreasing unit cost increment with task in any given year corresponding to the expected economies of scale associated with maintenance.
- Increasing unit cost increment with time, from year to year. This observation highlights the increasing unit cost noted in section 6.2 of this report.
- The convergence of incremental unit cost at high tonnages.

The trend of the results is as expected and therefore it can be concluded that the proposed maintenance costs show a sensible pattern.

The applicable task lines are shown with Newlands showing the sloped line because its tonnage increase substantially during the period and the others are relatively static.

Figure 42 Regressed Maintenance Costs Proposed



When observed over the whole period the following AT1 ($000/MGTK) values emerge and these are shown in Table 11 compared with those proposed.

Table 11 Proposed and Observed AT1 Values

	2009-10		2010-11		2011-12		2012-13	
	Proposed	Observed	Proposed	Observed	Proposed	Observed	Proposed	Observed
Blackwater	0.54	2.00	0.55	2.00	0.57	2.00	0.58	2.00
Goonyella	0.54	1.90	0.55	1.90	0.57	1.87	0.58	1.88
Moura	0.95	2.49	0.97	2.51	1.00	2.51	1.03	2.51
Newlands	0.78	2.78	0.80	2.37	0.82	1.90	0.84	1.91

The difference between those AT1 values proposed by QR, on the basis of “close to the asymptotic point of the exponential curve” for Blackwater and Goonyella, and rolled forward to align with the previous analysis in the cases of Moura and Newlands, and those actually observed in the QR submission, highlight an important difference.

That is, that the UT3 submission has estimated maintenance costs on a completely new basis, where large rises in maintenance costs are driven by the large rises in tonnage and other initiatives.

F

Since much of the tonnage rise are somewhat speculative and the maintenance initiatives are somewhat experimental[49] the basis upon which a straightforward calculation can be performed is not sound, particularly if the adjustments proposed in this report are applied.

Nevertheless, in order to recognise the new paradigm in both tonnage increase and maintenance approach, it is appropriate that the AT1 values change and it is proposed that a sliding transition occur. This sliding scale is shown in

Table 12 Recommended AT1 Values

	2009/10	2010/11	2011/12	2012/13
	Recommended	Recommended	Recommended	Recommended
Blackwater	0.54	1.03	1.51	2.00
Goonyella	0.54	0.99	1.43	1.88
Moura	0.95	1.47	1.99	2.51
Newlands	0.78	1.16	1.53	1.91

[49] As described in this paper earlier

8. Conclusions

8.1 QR's Method for Developing the Proposal

The UT3 Proposal represents a significant shift in method from previous Undertakings.

QR is, for the first time, attempting to construct its management, program and cost estimates on a stand-alone basis and this has resulted in a substantial improvement in the transparency of its costs.

Nevertheless, in moving away from a more integrated model it is our view that QR Network has sought to replace many of the older functions with direct replacements rather than taking the opportunity to restructure with multi-skilling in a stand-alone mode for the CQCR and is evidenced by the low proportion of "specific" allocations compared with the "standard" allocation in the System Wide costs.

In relation to maintenance, QR has proposed very large increases in MPM costs associated with new strategies to provide a step change in attacking the single largest cost driver, coal fouling of ballast. We find however, that QR has not reflected these new arrangements in the benefits that should be available to Routine Maintenance. In fact, without benefits to RM, the MPM program is unjustified except where it is physically impossible to carry out corrective maintenance but this has not been apparent.

QR has proposed two new components of maintenance cost, asset charges and margin. We believe the proposed asset charges to be realistic. However, we believe a margin is only relevant for direct labour costs and that any notional assessment of projected labour costs (4%) not be accepted.

8.2 Recommended Adjustments

In operations we have recommended adjustments on the basis of our concern with the large proportion of costs allocated from System Wide costs. We have found that misallocation or double counting has occurred and the main reason for this is the inappropriate structure of the Costing Manual. Consequently we recommend a review of the Costing Manual, particularly the allocation basis.

In maintenance we have recommended adjustments on the basis of the expected influence of the heavy MPM program providing benefits in RM as well as the rejection of many parts of the margin.

In relation to the MCI, if implemented this should occur with a productivity factor X, in the form MCI-X. We support the MCI concept as it has the potential to more accurately reflect cost movements but given that an incentive to improved productivity is required. X is an incentivisation mechanism and 1%[50] does not appear to be unreasonable in the context of the introduction of large capital equipment to perform many of the tasks previously performed by smaller machines.

In summary, QR is proposing to alter the way it performs maintenance and it has indicated that large benefits will accrue. We have quantified what we believe will be the benefits in the absence of indications in QR's proposal.

[50] In the context of a value of 4% for MCI. That is 25% of MCI.

Appendix A

Terms of Reference

Operations

(a) assess QR Network's forecast operating cost to ensure that the forecast cost does not reflect:

(i) costs that are also included in other operating cost categories (i.e. there is no 'double-counting');

(ii) operating costs associated with QR's above-rail activities;

(iii) other costs (e.g. overheads) associated with specific capital works projects, which are the subject of separate applications to the Authority; or

(iv) any other source of double-counting that the consultant may identify.

(b) adjust QR Network's forecast cost to remove any double-counting (if applicable), as identified in (a);

(c) benchmark QR Network's forecast operating cost (using the adjusted forecast cost in (b) if applicable) against the operating cost of relevant industry comparators for efficiency;

(d) identify and explain the difference between the (adjusted) forecast cost and the benchmark cost;

(e) determine whether or not QR Network's (adjusted) forecast cost is reasonable and:

(i) if reasonable, the consultant should confirm its acceptance of QR Network's (adjusted) forecast and provide its reasoning; or

(ii) if not reasonable, the consultant should determine a reasonable forecast for the cost category with reference to the analysis in (c) and provide its reasoning.

(f) determine whether QR Network's forecast operating costs include an adjustment to reflect productivity improvements over the regulatory period (e.g. x-factor or other adjustment):

(i) if QR Network has not proposed an adjustment to reflect productivity improvements, assess whether or not this assumption is reasonable based on relevant factors (e.g. forecast volumes / capital expenditure) ; or

(ii) if QR Network has proposed an adjustment to reflect productivity improvements, assess the reasonableness of that adjustment taking into account relevant factors (e.g. forecast volumes / capital expenditure); and

(iii) in either case, the consultant should confirm its acceptance or not of QR Network's proposal. If QR Network's proposal is unacceptable, the consultant should determine an appropriate adjustment to QR Network's forecast ~~maintenance~~ operating costs to reflect productivity improvements. The consultant should provide its reasoning.

Maintenance

Sub-task 3.3.2 requires the consultant to assess QR Network's forecast maintenance costs categories for reasonableness and efficiency.

QR Network's maintenance forecast costs are built-up based on forecast unit rates and the expected level (i.e. volume) of maintenance for each activity. Accordingly, the consultant will:

(a) assess QR Network's forecast maintenance cost to ensure that the forecast cost does not reflect:

(i) 'double-counting' of maintenance costs by allocating the same cost to both an individual system and to the 'system-wide' maintenance cost category;

(ii) operating costs associated with QR's *above*-rail activities;

(iii) costs (e.g. overheads) associated with specific capital works projects, which are the subject of separate applications to the Authority; or

(iv) any other source of double-counting that the consultant may identify.

(b) adjust QR Network's forecast cost to remove any double-counting (if applicable), as identified in (a);

(c) benchmark QR Network's forecast maintenance cost (using the adjusted forecast cost in (b) if applicable) against the maintenance cost of relevant industry comparators for efficiency, which comprises:

(v) QR Network's proposed unit rates;

(vi) QR Network's forecast level of maintenance for the specific activity, taking account of whether:

- *above*-rail activities are inappropriately affecting QR Network's maintenance activity levels (e.g. above-rail delays and/or cancellations);
- any forecast increase (decrease) in a specific maintenance activity, particularly ballast under-cutting, is the result of QR Network under (over) performing required maintenance tasks since 2001; and
- the extent to which QR Network's activity is satisfactory in terms of achieving long term sustainability of the CQCR network and service quality (i.e. an efficient mix of both preventive and corrective maintenance);

(b) identify and explain the difference between the (adjusted) forecast cost and the benchmark cost;

(c) determine whether or not QR Network's (adjusted) forecast cost is reasonable and:

(i) if reasonable, the consultant should confirm its acceptance of QR Network's (adjusted) forecast and provide its reasoning; or

(ii) if not reasonable, the consultant should determine a reasonable forecast for the cost category with reference to the analysis in (c) and provide its reasoning;

(d) determine whether QR Network's forecast maintenance costs include an adjustment to reflect productivity improvements over the regulatory period (e.g. x-factor or other adjustment):

(i) if QR Network *has not* proposed an adjustment to reflect productivity improvements, assess whether or not this assumption is reasonable based on relevant factors (e.g. forecast volumes / capital expenditure); or

(ii) if QR Network *has* proposed an adjustment to reflect productivity improvements, assess the reasonableness of that adjustment taking into account relevant factors (e.g. forecast volumes / capital expenditure); and

(iii) in either case, the consultant should confirm its acceptance or not of QR Network's proposal. If QR Network's proposal is unacceptable, the consultant should determine an appropriate adjustment to QR Network's forecast maintenance costs to reflect productivity improvements. The consultant should provide its reasoning.

The consultant will undertake tasks (a) to (e) for QR Network's forecast maintenance cost categories for each CQCR system and for each year of the UT3 period (expected to be 2009-2014).

Task (f) need only be undertaken at a regional level (i.e. total forecast maintenance costs for the CQCR) over the UT3 period.

Incremental Maintenance

(a) determine whether or not QR Network's proposed AT_1 reference tariff (i.e. incremental maintenance cost), for each CQCR system is reasonable based on:

(i) assessing QR Network's proposed data, methodology and supporting information;

(ii) benchmarking QR Network's proposed forecast incremental maintenance costs against relevant industry comparators (on a $/'000 gtk basis); and

(iii) any other factor the consultant considers relevant;

(b) confirm its acceptance or not of QR Network's proposal. If QR Network's proposal is unacceptable, the consultant should determine an appropriate AT_1 reference tariff for each CQCR system and provide its reasoning.

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