ABOVE AND BELOW RAIL COSTS
REVIEW OF QR PROCEDURES 1998/99

1 INTRODUCTION

This paper reviews the current cost of network management and maintenance in QR, as published in the QR Annual Report, based on the 1998/99 Management Accounts supplied to QCA by QR. The majority of these costs are associated with infrastructure maintenance activities but there is also a significant component related to network operational management (master train planning and train control) and asset ownership and management.

QR has now largely separated its maintenance activities from its asset management activities. Maintenance is undertaken by Infrastructure Services Group (ISG) whilst asset management is largely the responsibility of the Network Access Group (NAG). Both of these can call on other units within QR for specialist services, of which the most important is the Technical Services Group (TSG), which maintains asset records and provides specialist technical advice. Telecoms asset management currently remains outside NAG, although maintenance is undertaken by ISG. Although NAG includes the master timetable function, routine train planning and train control remains within the above-rail train operating groups (CMF and MARS).

QR estimates the costs of these services based on the analyses contained in the QR management accounts. As part of its assessment of QR's draft undertaking, the QCA has engaged Bullpin Pty Ltd to undertake a review of the separation of assets and costs between QR's above-rail (AR) and below-rail (BR) operations. This review will assist in establishing arrangements under which QR will divide its costs and assets in future periods. AR costs (totalling $ 956 million in 1998/99) are those associated with train operation and conceptually correspond to those that would be incurred by train operators who had no responsibility for the main infrastructure; BR costs (totalling $ 509 million in 1998/99) are those associated with infrastructure management, maintenance and operation (i.e. signalling and train control) and correspond to those that would be incurred by a stand-alone access authority.

Many of QR's costs can be unambiguously classified as either AR or BR directly from the accounting system and a large proportion of the BR costs can also be attributed directly to a line section. However, there is a significant amount of expenditure that is related to functions that cover both AR and BR and the apportionment of this expenditure requires considerable additional analysis.

This paper contains four chapters in addition to this introduction. Chapter 2 provides an overview of the process. Chapter 3 discusses the coverage and reliability of the base data used in the process. Chapter 4 covers the treatment of individual cost areas and Chapter 5 presents a summary and recommendations.

2 OVERVIEW

2.1 INTRODUCTION

This chapter provides an overview of the QR accounts and cost-apportionment procedures. The first section gives a brief description of the current (May 2000) organisational structure. The second section summarises the 1998/99 results to provide a framework for the succeeding chapters that deal with individual groups of costs. The third section gives a general description of the apportionment process as background to the succeeding chapters.

Unless otherwise stated, all financial and operating data in this report has been taken from the QR 1998/99 Management Accounts.

2.2 QR ORGANISATIONAL STRUCTURE

QR has undergone a number of reorganisations in recent year. The most fundamental in recent years took effect from 1 July 1998, when the majority of the AR and BR functions were separated from train operating functions through the establishment of an Infrastructure Services Group (ISG) which became responsible for all infrastructure maintenance. Previously this activity had been managed by the operating businesses, depending on their 'ownership' of different parts of the network. Since this restructure, QR has consisted of the following Business Groups, with the following broad responsibilities:

- Coal and Mainline Freight (CMF): responsible for all coal and minerals traffic, together with all traffic on the North Coast and Mt. Isa lines
- Metropolitan and Regional Services (MARS): responsible for all passenger services, together with freight not handled by CMF (primarily to and from the South West, the Central West and the Northern Tablelands);
- Network Access Group (NAG): responsible for managing the infrastructure assets and managing access to the network, both by the QR above-rail operators (CMF and MARS) as well as third parties
- Infrastructure Service Group (ISG): responsible for undertaking the construction and maintenance of QR's infrastructure as required by NAG and (in the case of Telecoms) by the central telecoms management.
- Workshops Service group (WSG): responsible for undertaking rollingstock capital projects and maintenance activities
- Technical Services Group (TSG): responsible for providing technical engineering advice and assistance to all parts of the organisation
- Corporate: responsible for providing central corporate services including finance, personnel policy, IT policy and systems development, telecoms management, audit, safety and general management

2.3 1998/99 RESULTS

Table 2.1 presents a detailed analysis of the division of QR's expenditure for 1998/99 into AR and BR. A summary version is given on page 45 of the 1998/99 Annual Report. A number of ancillary activities that are not associated with the provision of rail infrastructure and services (such as Treasury activities) have been separately identified as 'Other' and some costs have been recategorised to provide a clearer picture.

Table 2.1 QR expenditure 1998/99 ($000)

	Above-rail	Below-rail	Other	Total
WORKING EXPENSES				
Train Running	392,633		0	392,633
Traction Electricity		44,156		44,156
Direct Station Costs	160,985	2,615	0	163,600
Marketing Costs	26,299	0	0	26,299
Business Management	34,093	3,764	0	37,857
Other	53,249	(6,177)	11,680	58,752
Corridor/Regional Costs				
Operations	24,195	29,732	0	53,927
Infrastructure Maintenance	28,827	263,916	114	292,857
Other	21,833	7,199	0	29,082
Subtotal	74,905	300,847	114	375,866
Corporate Overhead	50,843	24,324	0	75,167
Total	793,007	369,529	11,794	1,174,330
%	68%	31%	1%	100%
CAPITAL CHARGES				
Depreciation and Amortisation				
Rollingstock	108557	2,664	0	111,221
Infrastructure & Other	32,393	133,806	2	166,201
Total	140,950	136,470	2	277,422
Loss on Disposal of Assets	22,240	3,249	0	25,489
Interest Expense	0	0	256,885	256,885
Total Capital Charges	163,190	139,719	256,887	559,796
	29%	25%	46%	100%
TOTAL OPERATING EXPENSES	956,197	509,248	268,681	1,734,126
	55%	29%	15%	100%

In 1998/99, about 68% of working expense was associated with AR activities and 31% with BR (the provision of infrastructure and the operation of signalling and train-control). The residual amount was associated with external consulting services and finance charges. This split between AR and BR parallels that generally found for the railway industry world-wide.

Depreciation charges are split evenly between AR and BR. Almost 60% (by written-down value) of QR's assets are BR but this is countered to some extent by their generally longer asset lives.

The remainder of this review examines the procedures by which the BR share of costs ($369.5 million) was estimated.

2.4 SOURCES OF 'BELOW-RAIL' COST

Section 2.2 summarised the current QR organisational structure. Although infrastructure maintenance is centralised within ISG, most of the other groups retain some BR functions. For example, TSG provides ad hoc technical advice to local track engineers, both CMF and MARS provide train control services, Corporate provides overall financial management and so on. The total BR costs therefore include costs from most of the Business Groups (Table 2.2).

Table 2.2 'Below-rail' working expenditure by source 1998/99 ($000)

	Source of expenditure						Total
	CMF/ MARS	NAG	ISG	WSG	TSG	Corp	
Train Running		44,156					44,156
Direct Station Costs	2,615						2,615
Marketing Costs							0
Business Management	1,169	2,595					3,764
Other		8,437	(26,634)			12,020	(6,177)
Corridor/Regional Costs							
Operations	28,698	1,034					29,732
Infrastructure Maintenance	8,049	4,851	251,018				263,916
Other	7,199						7,199
Subtotal	43,946	5,885	251,018				300,847
Corporate Overhead					1,193	23,131	24,324
Total	47,730	61,073	224,382		1,193	35,151	369,529
%	6%	17%	61%	-	0%	9%	100%

Although nearly 80% of the expenditure comes from the specialist infrastructure groups, NAG and ISG, there is a substantial minority of over $80 million from the operating and general groups.

2.5 SUMMARY OF APPORTIONMENT PROCESS

The process of identifying costs as AR and BR is undertaken as an integral part of the preparation of the QR annual management accounts. This process, which is similar to that undertaken by most of the major railways of the world, reorganises the financial accounts from being based on cost centres (such as locomotive depots) to being based on outputs, such as passenger and freight services. As described in the QR Costing Manual (QRCM), it does this by one of three methods:

- Identification: where a cost can be uniquely identified to a particular activity directly from the accounting system e.g. container terminal staff can be identified to above-rail freight services and infrastructure maintenance workers can often be identified to a particular stretch of track

- Attribution: where a cost is not explicitly identified within the accounting system but where there is a reasonable linkage between that cost and a particular output
- Allocation: where the cost is of a general nature with no specific link to a particular output and its division between outputs can only be done on a general basis

The need to attribute costs between activities is generally associated with the costs of supervision and related activities. Although many of these costs are accounted for at a depot or regional level for convenience, they are generally closely related to the number of staff or general level of activity within the region and thus any change in the level of activity will have a flow-on effect at the depot or regional level (for example, telephone bills may be paid at a regional level, even though the calls are made at local offices). In such cases, in the absence of further information, it is perfectly reasonable to distribute such costs in proportion to an appropriate 'cost driver' (which is often the aggregate labour cost) and thus attribute the costs to outputs in proportion to the associated labour.

Attribution also arises when an activity (such as train control) is undertaken regionally and it is required to distribute it to a lower geographical level, such as an individual line. In such cases, it is often possible to find a cost 'driver' (such as train-km) which is strongly correlated with the activity and that can be used as a basis for apportionment[1].

Allocation as used in QRCM is a more general procedure. It principally arises when there are corporate functions (such as finance or personnel) that do not have direct links with day-to-day operations. Such functions are often related to the general scale of the organisation. If an organisation doubles in size, it is likely these central functions will also double, either in actual terms or by splitting off subfunctions to become functions in their own right. The same often happens in reverse; a small organisation may not have separate finance, personnel and company secretary functions but instead combine them as an administrative unit. In such cases, allocating these costs pro rata to all others would therefore be a good approximation.

Nearly 75% of BR costs in the 1998/99 cost apportionment are 'identified', that is they are unambiguously and wholly BR (Table 2.3). About 16% are 'attributed', i.e. estimated by some form of pro-rating on a causal basis with only 10% being 'allocated', i.e. distributed on a general basis such as an expenditure mark-up. This last proportion was artificially low in 1998/99 as it was depressed by a large negative inventory adjustment but even when this is neglected the allocated proportion is only about 15%. In general, therefore, most of the costs can be clearly identified as BR and alternative allocation procedures for the remaining cost items are likely to have relatively little impact.

However, merely being able to identify a cost as BR is only the first step. Costs also need to be identified geographically and they can therefore also be classified in terms of their degree of geographic certainty. Where costs can be directly linked to a specific line-section, as with work undertaken by track gangs, they have been termed 'line-section specific'; where they can be identified with a particular region but not with a single line-

[1] This may or may not be a good approximation to 'stand-alone' cost. Economies of scale may mean that the cost of performing some activities on a stand-alone basis is more than the attributed cost.

section, they have been termed ‘regional’ and where they are of a general corporate nature they are termed ‘system-wide’.

There is naturally a strong correlation between the method of apportionment and the level to which a cost can be apportioned and a similar pattern emerges, with nearly 70% of the costs identified directly to a specific line-section. A further 17% can be linked to a specific region or corridor (say the coal systems or the Mt. Isa line) with only 15% to be distributed at the system-wide level. In practice, the only direct costs that are not linked to line sections are the train control costs and these can be readily associated with individual corridors. Almost all the other regional costs, and a component of the system-wide costs, are administration and supervision costs which are normally distributed in proportion to measures of output such as the direct maintenance costs and quantum of assets under their control.

Table 2.3 Correspondence between method and level of apportionment of QR ‘below-rail’ expenditure 1998/99 (% of total costs)

Level	Method			Total
	Identify	Attribute	Allocate	
Line-section	63	6	0	68
Regional	8	8	1	17
System-wide	4	2	9	15
Total	74	16	10	100

In summary, the scope for discretion in the estimation of BR costs is relatively limited; most costs can be unambiguously estimated and identified to either specific line-sections or corridors. The main costs where there are limited causal links are corporate overheads and some extraordinary costs such as severance payments and inventory adjustments, although these latter would not normally be included as recurrent costs.

3 BASE DATA

3.1 INTRODUCTION

This chapter comments on the quality and level of detail of the base data used for the preparation of the MA. It first discusses the general characteristics of the current accounting system (SAP) and then comments on particular issues for the main business groups associated with BR costs.

3.2 SAP

Traditional railway accounting systems were centred on a General Ledger (GL) that recorded costs in terms of three or four dimensions:

- responsibility (or cost) centre, which recorded the organisational unit responsible for the cost
- activity, which described the cost in functional terms (e.g. safeworking, freight handling, loco driving)
- location of the cost, which recorded where the cost was incurred (e.g. line section)
- type of cost (e.g. labour, materials, sundries)

These types of accounts were used by almost all railways until recently, with varying degrees of detail in terms of the various account descriptors. The system was supplemented by the use of work orders (or job orders), particularly in workshops as well as by infrastructure gangs when working on capital projects. These work orders also allowed overheads to be directly allocated to activities, often so that appropriate mark-ups could be charged to capital work and work for third parties.

By contrast, SAP has only two dimensions in its GL, a cost centre and the cost element (labour, material etc). Any other cost information can only be obtained by using work orders, which will typically specify the type of work being undertaken and the location or asset where it is being done, and apply a standard cost to the time booked to the job. While this may be less costly in terms of transaction costs, compared to the old systems that required skilled accounts clerks to code expenditure, it presents difficulties in producing a reliable set of MA, and particularly in splitting expenditure between AR and BR. It is particularly important that a consistent approach is used to derive the standard costs; great care should be used if they attempt to recover any costs beyond those of their immediate cost centre.

As QR is an integrated railway, the accounts structure should enable AR and BR costs to be identified with a minimum of ambiguity. In the absence of work orders, cost centres should therefore be established which ensure that all activities that are directly associated with declared services, whether maintenance of the associated assets or in the operation of the services themselves, are explicitly identified (this is a particular problem in operations administration). However, in many cases this is not sufficient as a cost centre will work on a range of assets either by type (as with facilities maintenance) or by location (as with track maintenance). In such cases, a work order system must be established which enables the nature and owner of the asset to be readily identified; in

particular such orders must clearly identify 'declared' infrastructure[2] (which is a direct BR cost) from 'undeclared' infrastructure (which may only be an indirect BR cost as an overhead to an internal service provider).

An important consideration in designing the cost centres and work order systems is that very detailed coding systems are often self-defeating, as most people can only remember a limited number of codes. The continuing demise of specialist accounts clerks means that the base data needs to be subjected to quality checks, both automatically and manually, and work order codes should be designed so they can be easily remembered.

As the work order data will be the primary source of information on functional expenditure, it is critical that the unit rates used to mark-up labour rates to allow for unproductive time, minor consumables etc are accurately derived so that the net expenditure not booked to work orders at each cost centre is minimised. If these net expenditures are significantly different to zero, the MA process will subsequently need to distribute this residual to the activities undertaken by the cost centre. The only guide to this is the work orders and MA will then need to derive their own unit rates and apply them. This is a major task in itself but also will inevitably raise issues on the comprehensiveness of the activities captured through the work order system. Because of their pervasive nature, involving almost every unit throughout QR, it is particularly important that the work orders/charge-out rates for motor vehicles, telephones, PC's and the like are correctly calculated. They should also be checked to ensure they are not significantly greater than the equivalent rates from third parties, where such information is available.

3.3 ISG

ISG are currently introducing a comprehensive set of work orders designed around specific activities (or 'products'). In theory, this should provide much of the information that is currently only partially available but it is essential that the expenditure actually booked to each work order is monitored to ensure it is reliable. It is appreciated that 1998/99 was the first year that SAP was fully operational but detailed analysis of a substantial sample of work orders from that year showed a marked variation between regions in the way in which costs were recorded.

In order to clearly identify ISG maintenance as AR or BR, all infrastructure should be clearly identified as declared or undeclared; this can easily be done by using a specific code in the customer area of the work order, for example, or by linking it through the equipment number.

3.4 TSG

TSG have a long history of project costing through their past emphasis on capital works planning and projects. They provide ad hoc technical advice to field units that can be

[2] This term is used as shorthand for infrastructure used wholly or partly in connection with declared services in a direct manner (e.g. track or the backbone telecommunications network). It does not include infrastructure used indirectly by service providers e.g. the depots for maintenance gangs or the plant and vehicles that they use.

treated as a gang or infrastructure administration overhead but significant items of work should clearly identify the status of the infrastructure involved. This would cover such activities as the maintenance of a physical asset register and records.

3.5 OPERATIONS

Operations groups do not currently use work orders and the attribution of staff to functions is instead done in the MA by analysis of the pay centre. In some cases this is straightforward; the labour costs of all staff whose pay centre is a freight terminal can be included within freight handling costs, for example. In other cases, staff perform mixed functions, either individually or as a group, and in these cases QRMA undertakes regular staff surveys to determine the split of costs between functions.

Although the analysis of station and operational management functions is done thoroughly on a regular basis, it is a time-consuming process that relies heavily on the skill and persistence of the staff undertaking the work. In some cases, particularly for station duties where a single individual may be undertaking a variety of tasks, there is no real alternative. However, areas such as operations administration currently include train control, long and short-term train planning and loco and crew rostering within a common pay centre. If such a mix of below and above-rail activities is to continue within the current organisational structure, sub pay-centres should be introduced so that AR and BR costs can be unambiguously segregated as much as possible at source.

Train crew costs are booked to depots but not to the individual services that they operate. QRMA analyse crew rosters at each depot to determine work by type of service, with ballast, inspection and work trains, (collectively known as ‘BR departmental’) being the main relevant statistic for calculating BR costs. Crew costs at each depot are then distributed to services in proportion to the hours worked by service. The provision of such services is now included in the work order system and this analysis may not be needed for the AR/BR split in future years, as long as the unit rates used to charge for the trains in the work orders are properly based.

3.6 CORPORATE

Corporate costs can be divided into those that have a distinct and defined BR element and those that are of a general administrative or support nature. Examples of the first group include Property, which performs a variety of functions including the maintenance and rental of departmental housing (which is either AR or BR depending on the tenant) and the maintenance of land records (which is largely BR). Most corporate costs of this type can be addressed through a suitable definition of cost centres. The key, as in other areas, is to ensure that work on declared and undeclared assets is properly identified, particularly for Telecommunications and IT.

4 ESTIMATION OF BELOW-RAIL COSTS

4.1 INTRODUCTION

This chapter discusses the identification of below-rail costs within the MA accounts on an individual account basis. For convenience, the discussion follows the grouping given in Table 2.1.

4.2 TRAIN RUNNING

This activity is almost entirely AR. The only BR activity is traction electricity, which is on-sold by NAG to train operators, as the electrical overhead equipment is part of the infrastructure under NAG's responsibility. This is standard industry practice and is usually handled as a separate component within the access fee.

4.3 DIRECT STATION

The only Direct Station costs with a BR component are the costs associated with shunting BR work trains. These costs are probably better dealt with in the medium-term through using work orders for works trains, which would then be treated as a maintenance overhead (exactly as if works material was delivered by road). This approach would permit better identification of the line sections to which these costs should be allocated, as well as providing improved maintenance management cost information.

4.4 MARKETING

There are no marketing costs that are BR.

4.5 CORRIDOR AND REGIONAL COSTS - OPERATIONS

These costs include those directly associated with signalling and safeworking and train control, as well as the associated cost of administration and supervision. These costs are currently incurred by CMF and MARS, the above-rail operating groups.

Signalling and safeworking

Signalling and safeworking costs include the costs of operations staff at wayside stations and signalboxes who control train movements in areas that use methods such as staff and ticket. These staff are typically multi-skilled and perform their safeworking duties in conjunction with general station duties such as dealing with small freight and passengers. These staff, and the proportion of the time they spend on safeworking, have been identified on an individual station basis (and thus identified directly to specific line sections) from a regular physical survey undertaken by MA. However, most of their activities have now been centralised in train control centres and they typically now represent only about 5% of total station costs.

Train control

Train control is undertaken at a limited number of centralised locations, where the staff often work closely with train planners and crew and loco roster staff. Administratively, the costs of these planning and control activities are included under a single manager and

payroll point and the isolation of their costs has therefore required special analysis of staff lists. This is the most important case where separate payroll sub-centres should be introduced to enable AR and BR costs to be specifically identified within the accounting system.

The costs as presented in the MA include payroll costs, workers compensation and a small amount of corporate transfers (FBT, catering etc); the consumables and other costs associated with the performance of the train control function are included within operations administration.

The train control costs do not include train planning staff; these have been included in operations administration costs. These staff perform both AR functions (daily train planning) as well as BR functions (medium-term planning and scheduling) and should be treated as a direct costs which are specifically identified. This reinforces the need for a greater level of detail in payroll centres in this area.

Operations administration

Operations administration costs are the residual supervisory and administrative costs associated with train planning, train control and safeworking, after the direct train control (and desirably also the train planning) costs have been identified. They also include the full costs of the NAG Network Operations group.

Most of these costs have been attributed between AR and BR in proportion to those costs that can be directly identified. There is a minor error in allocating the costs of the MARS Manager Train Operations and the allocation of CMF GM Operations, GM MFARO[3] and the Citytrain Manager Train Operations. All of these include a significant component of employee-related transfer charges, and could be distributed on the basis of staff rather than total expenditure but the amount involved is relatively small.

4.6 CORRIDOR AND REGIONAL COSTS - INFRASTRUCTURE MAINTENANCE

These costs cover the direct costs of infrastructure maintenance together with the associated administration and supervision costs. Almost all infrastructure maintenance within QR is undertaken by ISG. Station and car-park maintenance within the Brisbane metropolitan area is undertaken by the Citytrain section of MARS. TSG also provides ad hoc technical advice to ISG field supervisors and engineers; in 1998/99 this was treated as an internal cross-charge to ISG at the corporate level.

Track, bridges, signals and electrical overhead are all treated similarly within the MA and generally in a reasonable manner. The treatment of the costs associated with the remaining infrastructure, facilities and telecommunications, raises some difficult issues, both conceptually and technically; although they are not costs of critical importance, their treatment within the MA should be reviewed so that it is more consistent with the

[3] Metropolitan Freight and Regional Operations

changed business structure within QR and particularly with the need to make the costs associated with the 'declared' infrastructure as transparent as possible.

Track, bridges, signals and electrical overhead

All this work is currently undertaken by ISG. ISG records its work by track section by booking to work orders at the track supervisor level; the hourly rates used for these work orders include an allowance for on-costs and supervision up to the level of the Track Services Supervisor (Level 5) but do not include costs at the district and regional level, which are included in 'Infrastructure Administration'. The work order system is being revised from July 2000, with the introduction of ISG 'products' which should provide a more structured approach to cost recording; in the 1998/99 management accounts, only some 64% of infrastructure maintenance expenditure at the track supervisor level was booked direct to a line section with the remainder (gang overheads such as annual leave, training, minor consumables etc) being booked generally to the cost centre[4].

The distribution of infrastructure-related costs between BR and AR is based on whether the infrastructure being maintained has been declared. Infrastructure which is maintained by QR but which has not been declared consists of two types:

- Private sidings (strictly speaking this should be classified as 'work for third parties')
- Yards and sidings where part has been declared and part has not.

Treatment of the first group is straightforward and these costs can be identified directly. The second group of infrastructure requires more analysis as the line sections currently do not distinguish between 'declared' and non-declared' infrastructure (except by chance) and the cost of maintaining 'declared' infrastructure is therefore derived by applying percentages on a yard-by-yard basis based on the estimated proportions of each group of infrastructure. As the shared line sections only represent about 7% of the total infrastructure maintenance cost, the current approach seems reasonable. However, in the longer-term, ISG should develop separate work orders for 'declared' and 'undeclared' infrastructure where practical so that the allocation process can be kept to a minimum. Conventions will need to be established for the treatment of turnouts but otherwise there should be few problems with track. A convention will also need to be established where a bridge carries both 'declared' and 'undeclared' tracks. The treatment of common trackside system equipment will also need to be addressed.

A more practical alternative may be for ISG to book all expenditure to NAG, as infrastructure owner and for NAG to develop a set of charges for AR users that can then be netted off to leave the BR component.

The 1998/99 MA omitted the 'above-rail' shares of signalling and electrical equipment in the operational portion of yards, because of uncertainty concerning the treatment of these assets. This is provisionally estimated at $2.1 million, which should be transferred to the QR AR estimate.

[4] As the SAP work orders become properly established, these costs should broadly net to zero with the 'credits' from the standard costs

Facilities

Facilities maintenance includes the maintenance of all fixed assets that cannot be classified as track, bridges, signals, telecommunications or electric traction. It thus covers a wide range of buildings, roads and related assets (such as electrical services, roads, fences etc), some of which are integral to railway operation but many of which are not. With the exception of most work on suburban stations, they are maintained by ISG facilities gangs, who record work orders in the same way as for track, bridges etc.

In the 1998/99 MA, these costs were analysed on a line-section basis and allocated as either AR or BR depending on a detailed assessment by accounting staff, undertaken in the previous year. This had separated MARS Citytrain facilities and the suburban car-park costs and had then manually allocated the costs, by line section, based on a judgement as to whether the asset being maintained was AR or BR.

The work was undertaken diligently and was as realistic an estimate as could be obtained of the cost of maintaining QR's infrastructure. However, it has two disadvantages as a long-term method. The first of these is that the costs defined in 1998/99 as BR include two distinct groups:

- those incurred because the asset being maintained is a BR declared asset (e.g. CTC hut)
- those incurred because the asset being maintained, while not declared, is being used by groups who are themselves maintaining declared assets (e.g. residences for track gangs)

The first group of costs is associated with QR's role as 'asset manager'. However, the second group is only relevant to QR in its role as 'maintenance contractor' and should be removed from the direct AR/BR split and instead transferred to the groups who own the asset being maintained; the costs will then flow through to the BR/AR split depending on the treatment of the activities undertaken by the asset owner. Under this approach, the cost of maintaining residences would not be split between AR and BR on the basis of the number of staff from ISG, CMF, MARS etc who are occupying the houses, as is currently done, but would instead be included as an overhead to the relevant ISG and CMF costs and be distributed accordingly.

The second disadvantage of the current approach is that it requires a very high level of skill and knowledge of the railway from the person undertaking the allocation if it is to be effective and thus is not a sustainable approach in the long-term.

Analysis of the 1998/99 work orders for facilities maintenance showed about 35% of total expenditure was on internal support facilities such as residences, administration buildings and workshops etc. About 6% was on undeclared operational facilities, used by AR operators; examples include goods sheds, container yards and cattle loading ramps. The remaining 59% was for declared infrastructure; however, almost all of this was for

stations and carparks, with under 2% for trackside buildings such as CTC huts and telecom buildings.

The total facilities expenditure charged to BR is likely to be a little larger (by around 10%) than the amount allocated in the 1998/99 MA, but the bulk of this will either be stations or ISG gang overheads.

Telecommunications

There are two groups in QR concerned with telecoms. ISG maintain the infrastructure but the asset managers are in the Telecoms unit within the DCE. The costs of both groups thus need to be combined to derive the total cost of telecoms within QR. Although this is straightforward, it is difficult to establish the costs of maintaining different parts of the telecoms network as work orders for the ISG gangs are only being introduced from July 2000. All that is therefore currently available is the expenditure incurred by cost centre (i.e. the maintenance gangs). As the gangs do work for a variety of users, including both the back-bone telecoms network as well as equipment within internal 'customers' premises' (CPE) (e.g. radios for track gangs) the estimation of the BR costs can only be approximate at present.

This lack of detailed costing data is compounded by the conceptual problems associated with allocating telecoms costs. The telecoms network consists of a 'back-bone' network, comprising a mixture of microwave and optic-fibre networks (some owned by QR and others by third parties such as Telstra) together with a range of CPE connected to the backbone network through equipment rooms. The equipment attached to the network falls into two groups:

- that associated with operational requirements (and which is thus declared)
- that used by business units in the course of their activities

The estimation of BR telecoms costs therefore requires:

- the estimation of the costs associated with the declared infrastructure
- crediting these costs for the use of the declared infrastructure for non-operational purposes[5].

Credits for the use for non-operational purposes can be approached in three ways:

- allocating the costs between operational and non-operational use on a fully-allocated basis i.e. pro rata to usage
- estimating the marginal cost incurred in providing a backbone network capable of carrying the current traffic compared to one sufficient for operational requirements only
- on a commercial basis by charging the non-operational users the cost of using a third-party network.

[5] This is a major issue between Brisbane and Rockhampton, where well over 90% of the usage is for non-operational purposes (data transfer etc)

All of these methods have problems. Using a fully-allocated approach would charge almost all the backbone cost on some parts of the network onto non-operational users. Using a marginal cost approach would have the opposite effect because of the cost characteristics of telecoms infrastructure. Using a commercial approach, at the current level of use between Brisbane and Rockhampton, would probably substantially over-recover the relevant capital and maintenance costs although the current level of demand would almost certainly change if commercial charges were levied instead of the present policy of free usage. In the long-run, however, the 'commercial' approach will almost certainly be preferable both in ensuring in-house usage is economically justified as well as providing a better and clearer mechanism for further investment in capacity.

A further consideration is that third-party operators will presumably wish to use the QR telecoms network at some stage, for either operational or business purposes. If QR wishes to charge them a fee for doing so, it will then need to demonstrate that the QR AR operators are paying similar fees for their use of the network.

In the 1998/99 MA, QR allocated 33% of telecoms costs to BR, using a general default allocator. An alternative estimate of 50% has been derived using the principles discussed in this section, based on the estimated costs of maintaining different sections of the network and applying the commercial approach outlined above. Of this 5% is for signals maintenance, about 28% for declared assets and 17% for assets used by BR service providers

Infrastructure administration

Infrastructure administration costs consist of three elements:

- a share of the overhead costs of the MARS facilities maintenance manager
- the costs of the Network Infrastructure group within NAG
- a share of the costs of all ISG administrative and supervisory units above the level of Track Services Supervisor. This represents around 90% of the total infrastructure administration costs.

The share of the MARS facility manager charged to BR in 1998/99 was based on the distribution of direct suburban facility maintenance costs in 1997/98. This proportion should be reviewed as part of the general revision of the treatment of facilities maintenance costs discussed earlier. It is probably simplest if these costs are removed from infrastructure administration and instead treated as part of the facilities maintenance costs proper. This will simplify the internal transfer of those costs that are for other groups within QR.

All the NAG costs are identified as BR.

The proportion of the ISG supervision costs allocated as BR follows the split of functional maintenance for each asset type. This approach is generally reasonable and the resultant shares of costs are consistent with that approach. As with operations administration costs, a substantial component of the transfers are employee-related

(including significant vehicle costs re-allocated from the plant section to the various engineering groups) and these could perhaps be distributed directly to the lower-level cost centres. The costs of the ISG Facilities Manager are probably best dealt with, as for the MARS manager, by removing them from administration as such and including them with the direct costs of facilities maintenance. This manager also controls graphic services, administration buildings and records management, all of which costs are transferred internally within the MA process; currently, these transfers do not attract a share of his management costs and this should be reviewed.

4.7 CORRIDOR AND REGIONAL COSTS - OTHER

Other corridor expenditure consists of derailments, private siding maintenance and work trains.

QR did not book any specific costs against derailments in 1998/99. Whilst minor derailments can generally be dealt with at low cost, the cost of major derailments can be substantial and many railways have a special account for such incidents, generally controlled in a general way by senior engineering management, although the money may actually be spent by gangs over whom they have no direct control. The cost of any such incidents on QR in 1998/99 will therefore have been absorbed within the individual regional budgets. QR are now proposing to deal with major incidents through the introduction of a ‘risk premium’.

Private siding maintenance was discussed previously in the section dealing with track, bridges etc. As noted, the estimates in the 1998/99 QR MA exclude the maintenance cost of signals and overhead electrical equipment and these should be included as AR costs (although the amount involved is minimal).

ISG use work trains to position ballast and materials for maintenance, as well as to haul special rail-mounted equipment. The cost for these is currently estimated within the MA by extracting the resources used (train-hours, loco-km etc) from the operating statistics and applying estimated unit costs. This is a well-established procedure and has been carried out in a reasonable manner. However, it is difficult to attribute these costs to the individual line sections on which work is being done, as the operating statistics for such trains relate to the sections over which the train travels, rather than the section of track for which the ballast is being used. A better approach to ensure costs are correctly identified to line sections would therefore be to have work orders for such trains, with costs being directed towards the line section for which the train movement is being made; this approach requires that realistic unit costs are used for cross-charging, which has not always been the case elsewhere.

The cost of work trains is initially worked out within the MA for all such movements. Some of these are associated with capital projects and the costs charged to capital are credited to working expenses through train running recoveries. The MA attribute all train running recoveries for CMF only, due to lack of information; in practice, those associated

with the MARS work trains which should be identified if possible, and this should be possible if work orders are introduced for the provision of these services.

No rollingstock administration costs are charged to BR. It could be argued that a small amount (under $0.5 million) should be allocated to cover the cost of the maintenance of BR service stock.

4.8 BUSINESS MANAGEMENT COSTS

Business management costs consist of the costs associated with ongoing management and supervision at the group and business unit level, including NAG. These costs exclude those associated with the central management of QR (included in Corporate Management in section 4.9). Administrative services performed by corporate groups for individual business groups (e.g. payroll services performed by DCE Employee Relations (a corporate unit)) are cross-charged to individual groups and included within the corridor and regional administration costs.

Group management

About 50% of these are NAG group management costs, covering the NAG general manager and finance costs, including some transfers from corporate functions; they are treated as 100% BR. The remainder represent the central management of the various business groups within CMF and MARS, including the group general managers, finance, safety, employee relations, and business development. A share of these latter costs, including transfers from corporate functions, has been distributed to BR to cover the cost of BR staff within CMF and MARS (primarily train controllers) as a markup on total expenditure excluding distillate.

Business unit administration

Business unit administration covers the costs of marketing and managing the freight and passenger AR services provided by the various groups. It has no direct relationship with the provision of staff for BR services and these costs have been identified as 100% AR.

NAG business development

NAG Business Development costs are exclusively associated with BR activities and have been identified as 100% BR.

Heritage

QR incurs some costs associated with the management and operation of heritage activities. They are treated as 100% AR.

4.9 CORPORATE OVERHEAD COST

'Corporate Overheads' are largely costs of a general corporate management nature, concerned with the development of general policy, major IT system developments and the financial monitoring and control of the individual business groups. Several of these (audit fees, strategy and planning, safety, Board and Chief Executive costs, TSG corporate projects and corporate other) are clearly of a genuinely corporate nature. Their expenditures are reasonable for an organisation of the size of QR and there are considerable difficulties in identifying individual costs within these that are specifically AR or BR. However, there are a number of activities, mostly within the Deputy Chief Executive's area, which are of a more direct nature and these are first discussed before addressing the basis by which the corporate overhead has been allocated to AR and BR.

DCE

The costs of a number of services performed centrally by the DCE group for administrative convenience are transferred from corporate costs to the individual business groups at an early stage in the MA process. These principally cover payroll and some other employee-related costs, about 50% of IT (e.g. the rental and servicing of computers as distinct from the development of systems), legal services and some property, telecoms and corporate finance costs.

Information services costs transferred out are the cost of IT facilities and support (e.g PC's and terminals in business units) and project development. The costs retained as corporate overhead are associated with the development and maintenance of corporate-wide accounting systems (principally SAP).

The ER costs transferred to business groups primarily consist of training and payroll, with a smaller element for personnel records and counsellors. The functions remaining are principally the General Manager Personnel, traineeship costs, industrial relations and internal consulting services. All these activities can be considered corporate-wide costs.

Property costs are the costs of property management, including the acquisition, sale and leasing of QR property and the management of residences. The costs of residences should be identified to the businesses whose employees use them and for MA purposes should be netted off with employee contributions towards their upkeep. The cost of other property-related activities should also be eventually credited with the associated revenues. As with facilities maintenance, the overall objective should be to establish the net cost of property-related activities associated with declared infrastructure. These are valid BR costs; all other property-related costs should be transferred to the relevant user.

Telecommunications costs were discussed previously.

Allocation of corporate overheads

The corporate overheads of major transport organisations such as QR show a constant relationship of around 5-10% of total expenses excluding depreciation. The level of

corporate overhead activity is clearly linked to the general scale of the organisation and total working expenditure. As the objective of the allocation is to approximate the corporate overheads that would be incurred were the individual units free-standing business organisations, total working expenses is thus probably the most realistic basis to use. This supports the 1998/99 MA allocation of corporate overheads to AR and BR in proportion to the total expenses (excluding the 'Other costs' discussed below).

However, there appears to be no allowance at the corporate level in QR for the corporate management effort applied to capital projects (which should properly be included in the cost of the capital project) and this should be allowed for before distributing the remainder to working expenditure.

4.10 OTHER COSTS

This group of costs covers miscellaneous items such as severance payments, the cost of surplus staff, capital projects expensed and inventory adjustments. It also includes extraordinary costs such as the Year 2000 project and costs of a technical accounting nature such as late General Ledger and audit adjustments.

VERS costs are an assumed 33% share of the severance payments made to staff who leave QR under a voluntary redundancy scheme. While a certain level of redundancy and severance payments are to be expected in the normal course of business, these are normally at a relatively low level and can be handled as a general labour on-cost at a system-wide level in the same way as, say, workers compensation. The VERS payments included in the 1998/99 accounts are clearly of an extra-ordinary nature and would not be incurred on an on-going basis.

A number of staff have been identified by QR as surplus and QR are paid a CSO to fund their continued employment. Some of these are in ISG; their costs were removed from the aggregate track maintenance costs discussed earlier and are specifically identified in this item.

Capital projects expensed costs cover activities that are of a capital nature but cannot be charged to the capital account at the end of the financial year as there is no corresponding asset on QR's books. This arises for one of two reasons:

- work is performed (usually in planning and design) which subsequently is written-off as the project does not proceed
- work is performed on assets that ultimately become the property of third parties (as has been the case with works associated with the South eastern Transitway).

Within reason, the first of these could be a legitimate BR expense, but should not represent a significant amount. The second group is essentially 'works for third parties'; either for payment (and in 1998/99 there were corresponding revenues for many of these projects) or 'pro bono'. Where these costs are BR, they should be clearly identified so that they may be associated with the corresponding revenues where relevant.

In 1998/99, QR undertook a major campaign to identify stock that had been issued but not used and to reconcile the physical stock with the recorded inventory, leading to a very large inventory adjustment for the year. The bulk of this was related to infrastructure, and generated a large credit for this item. Although there are inventory adjustments every year in the normal course of events, this one was abnormally large and any future adjustments would be of a much smaller order of magnitude.

QR's contribution towards the cost of the NSW-operated interstate service between Sydney and Brisbane is treated as 100% AR.

Although it could be argued that each year there will be the need to update and revise computer systems, the size of the Year 2000 project costs suggests that much of the work done under this project was of a one-off nature that would not be repeated on a continuing basis. An arbitrary 33% of the costs have been allocated to BR; as this is very close to the BR share of working expenses this is a reasonable estimate, but it is most unlikely this cost would be incurred on a regular basis..

Late GL and audit adjustments can be expected to occur every year and could probably be included with the DCE Corporate Finance costs in Corporate Overheads.

Other costs include Consultancy Services, unrecovered workshops costs (i.e. unrecovered from internal customers), Great Southern Pacific Express and finance and lease costs charged to working expenses. Consultancy services is an ancillary business which is not a core QR activity and QR excludes it from the AR/BR split; the costs associated with workshops and the GSPE are treated by QR as wholly AR; finance and other lease charges charged to working expenses are also excluded by QR from the AR/BR split.

4.11 REVENUE ADJUSTMENTS

The current QR presentation of AR and BR costs is consistent with the aggregate expenditure and revenue presented in the published financial statements. In practice, a number of these revenues should be treated as credits to various expenditure items to obtain a true picture of BR costs, particularly for quasi-ancillary activities such as Property, or where QR is receiving a fee for service, such as apprenticeships, payroll deductions or the input cost CSO for surplus staff. Netting off these revenues against costs will then give a truer estimate of the BR costs of QR.

These revenue items are either directly associated with BR activities (as in capital projects expensed) or affect internal service providers (such as the various ER-related costs). QR currently allocate these (and other) revenue items between AR and BR using the same principles as for the cost allocation; the BR allocation in 1998/99 was $31.3 million.

The most significant items are:

- Property-related

- Sale of material and scrap
- Gain on sale of assets
- Construction and other works revenue
- Employee relations
- Apprenticeship training
- Surplus staff (CSO from Government)

5 SUMMARY

The current procedures used by QR provide a good estimate of the division of costs between BR and AR activities. However, the reliability of the estimate depends heavily on the knowledge and diligence of the staff undertaking the work and measures should be implemented to enable more of this work to be undertaken automatically through the accounting system. This is particularly important with the introduction of the SAP system with its total reliance on work orders to provide details of expenditure by function and by asset type.

The separation of the BR and AR costs of QR is intended to provide a clear identification of the costs associated with QR as infrastructure owner and manager as distinct to the costs associated with QR as above-rail operator. The infrastructure that should be included in the BR costs is thus only that infrastructure that is used by declared services. All other infrastructure (freight terminals, infrastructure depots, most residences etc) either supports the above-rail operators or the various internal service providers (and thus QR in its role as maintenance contractor).

The accounting system should therefore ensure that BR costs, wherever they may be incurred in the organisation, are as clearly and unambigously identified as possible. This requires two developments to the accounting system as it was in 1998/99:

- The creation of more detailed payroll subcentres where (different) staff are currently performing a mixture of AR and BR functions within the same pay centre. This is particularly relevant to operations administration, with its mixture of AR and BR train planning and control tasks (Recommendation 1).
- A more structured use of work orders for all infrastructure maintenance activities (as envisaged in the current ISG plans for ‘product’ costing), including works trains and TSG professional services. It is essential each work order can identify the company area that ‘owns’ the asset and whether or not the asset is used for declared services. It is also important the overheads and mark-ups used in the various work orders are reliably derived so that the residual cost in each cost centre using them is minimised (Recommendation 2).

The technical procedures used by QR in the preparation of their MA are the equal of any in use throughout the world in terms of detail and accuracy. The following recommendations should therefore be seen as improvements to what is currently a very good system rather than as fundamental problems with the current approach:

- when revised paycodes have been developed (planned from July 2000) the treatment of operations administration costs should be reviewed (Recommendation 3).
- the current practice of transferring corporate ER (in particular), IT and TSG supply costs to the top level of branch administration should be reviewed. An alternative would be to distribute these costs directly as labour and material on-costs (which is effectively how they are incurred), thus reducing the rather substantial administration overhead costs (Recommendation 4).

- the treatment of facilities maintenance should be reviewed so as to separate declared and undeclared assets (these costs should probably also include those of the facilities maintenance manager) (Recommendation 5).
- the treatment of telecoms costs should be reviewed. Although the issue of the internal charging for telecoms will require careful consideration, QR's backbone infrastructure is increasingly being supplied by third parties and the 'commercial' model seems the most realistic approach to cost allocation. Detailed development of such an approach requires data that will only be available for the first time from July 2000 but it should be monitored throughout the year and the work orders refined to ensure a realistic cost model is developed for QR (Recommendation 6).
- review the treatment of capital overhead credits at the corporate management level (Recommendation 7)

Although the presentation of the AR and BR split in the QR Annual Report is constrained by the need to be consistent with the published financial statements, there are many costs which should be netted off at least partially against corresponding revenues, with only the net amount being charged to either AR or BR. Examples include property, capital projects expensed and the sale of scrap (against materials and supply costs). The presentation of the split could therefore be modified so that, whilst it reconciles with the published financial statements, such changes are included in the AR/BR split presented to QCA (Recommendation 8).

Mr Bullock has worked in transport for over twenty-five years, almost all of which have been as a consultant. He is currently a director of Bullpin Pty Ltd, having previously been a director of Travers Morgan Pty Ltd for over ten years. He specialises in operational, economic and policy analysis and has a wide railway experience, with particular emphasis on railway financial analysis and investment appraisal, restructuring and organisational appraisals and costing and pricing issues. He was responsible for the development of a detailed railway costing and strategic planning system, used as a key management tool in a large number of railways, as well as being jointly responsible for the development of the costing convention used in Australia for the costing of inter-system rail traffics and providing advice to several railways on financial systems and management accounting. He has worked for governments, regulators, railways, private-sector clients, private banks and international funding agencies including the World Bank, European Bank and Asian Development Bank. He has worked on over thirty railways in over twenty countries, including New Zealand, UK, Russia, the Baltic States, the Caucasus, Central Asia, Eastern Europe, China, India, south-east Asia, Central and South America and southern and eastern Africa and has acted as advisor to both the Argentinian and Indonesian governments on transport issues.