

The Integration Of Transit And WBOPDC Requirements Into A Single Performance Based Contract

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Abstract

While the logic for integrating highway and local road maintenance in the Western Bay of Plenty District is readily apparent when one considers the 'fish bone' nature of the road network, there are significant differences in the networks and the way they are managed which required consideration when the Bay Roads contract was developed. This paper provides an overview of these differences and the way in which the requirements of the two Principals were incorporated into the joint contract.

1. INTRODUCTION

In early 2001 Transit New Zealand ('Transit') and the Western Bay of Plenty District Council ('WBoPDC') agreed to work towards the implementation of a joint contract for the management of their road networks, in order to benefit from the efficiency of a long term performance based contract incorporating the two networks. Bloxam, Burnett & Olliver Ltd (BBO) was tasked with developing the Bayroads contract documents, incorporating the requirements of the joint Principals.

Transit's successful PSMC contracts for the West Waikato and Northland highway networks were used by BBO as the basis for the contract model. However, the nature of the WBoPDC road network and the way in which it needs to be managed differs substantially from that of the state highway network, necessitating additions and modifications to the Transit PSMC formula.

This paper outlines the differences between the two Principals in the management of their networks and their approach to performance based contracting, and the way in which the requirements of each were integrated into the Bayroads contract document. The information provided is intended as a guide for those with an interest in the structure of the contract document, rather than providing details for the technical specialist.

2. DIFFERENCES IN TRANSIT AND WBOPDC REQUIREMENTS

2.1 Road Network Differences

There are several fundamental differences between the two networks that reflect in the performance measures related to asset consumption and level of service for the pavement and surfacing.

The WBoPDC road network has a comparatively large length of lightly trafficked, often unsealed and/or under-width road sections. Traffic impacts on the pavement and surfacing are often of less consequence than environmental factors in terms of preservation of the asset. In contrast, the Transit network generally has high traffic

volumes, and the condition of the pavement and surfacing is more dependant on the impacts of traffic loading.

For the Transit network, there are significant road user costs related to the condition of the road surface (ie roughness and skid resistance), and road users expect highways to be smooth for long distance high speed travel. For considerable lengths of the WBoPDC network, traffic volumes are lower and the logic for a lower level of service (for instance higher roughness) on low volume roads is generally accepted by the community.

Generally therefore, the aim of the WBoPDC asset management program is to maintain a level of service in keeping with the amount of traffic using each section of road. As the rate of consumption of pavement life is relatively low, preservation of the asset is attended to by focussing on surface defects such as potholes. For the Transit network, management is generally focussed on limiting pavement life consumption, and providing a road surface condition which minimizes road user costs.

2.2 Assets To Be Maintained

For the WBoPDC network the Bayroads Contractor provides total services for all assets within the road corridor, whereas the services on the Transit network under the Bayroads contract exclude structural maintenance of bridges, culverts and any other structures. The WBoPDC network also requires services in its urban areas such as street cleaning, gardening and maintenance of pedestrian facilities and car parks.

Additional assets created within the WBoPDC network during the term of the contract are also required to be maintained under the Bayroads contract without adjustment to the lump sum, as the creation of such new or upgraded assets is a regular occurrence under the development provisions of the contract. For the Transit network the lump sum is adjusted for services required to maintain any new assets created during the term of the Bayroads contract

2.3 Impacts Of Traffic Growth

The highway network included in the Bayroads contract has generally been developed to the extent required to accommodate the projected traffic volumes within the contract period. Whilst some capital improvement works are anticipated, as with its previous PSMC contracts, Transit intends to procure these separately. Such projects would need to meet Transfund funding criteria at the time of construction.

The Western Bay District is experiencing considerable growth in population, resulting in growth in traffic volumes of around 10% pa in some locations. To accommodate this traffic growth whilst maintaining acceptable service levels requires a program of asset development including seal extensions, carriageway widening, sight distance improvements, footpath extensions and carriageway lighting upgrades. Such development is incorporated in the Bayroads contract within the lump sum. Prior approval of the performance measures which trigger such development work was obtained from Transfund.

2.4 Customer Relationships

WBoPDC asset managers are accountable to the elected representatives of rate payers in the district. It is important to the elected representatives that the satisfaction of rate payers be measured and maintained at a high level throughout the term of the contract.

Accordingly, the Bayroads contract incorporates a greater customer focus than seen on previous Transit PSMC contracts, and the means of measuring customer satisfaction with the public interface of the contract.

2.5 Performance Measures

2.5.1 *Philosophical Differences*

Transits performance measures used on previous PSMC contracts are in fact a mixture of both performance based and prescriptive requirements. Maintenance requirements which safeguard against the deterioration and loss of value of the key assets (for example structural condition, roughness) are performance based. However, many of the operational requirements (for example grass mowing; road marking) have performance criteria based on meeting standards, where Transit has a policy or standard that it wishes to have applied on a consistent basis across the whole of the national state highway network.

In the development of its performance measures, the WBoPDC has essentially started with a clean slate, and endeavored to adopt true performance based measures for all aspects of its operation. Continuing with the grass mowing example to illustrate this, grass on rural roadsides in the Western Bay District would not be mown unless necessitated for sight distance or some other performance requirement, such as drainage.

As well as the minimal use of prescriptive standards, the WBoPDC performance measures often relate the required condition of the asset to the probability and consequences of poor performance or failure. This risk based approach is illustrated in the WBoPDC KPM for Bridge Structure Maintenance whereby, for example, the condition of a bridge on a low volume road might be poor, but still acceptable, if the consequences of wash out and cost of reinstatement were low. Such a risk based system is not appropriate for bridges on the Transit network, where the consequences of poor performance of the assets is generally high. Such assets are maintained in a condition which ensures minimal risk of failure.

2.5.2 *Key Performance Measures*

Transit requires the Contractor to maintain its pavement and surfacing assets at about the current condition, which is expected to consume the greater part of the lump sum for services on the Transit network under the Bayroads contract. Thus Transit considers as key those performance measures which ensure the condition of the pavement and surfacing assets is maintained. Consequences of non compliance with key performance measures are greater than for other types of performance measures. Transits key performance measures are generally characterized as being few in number, and each focussing on a single condition requirement with a 'hard measure' such as high speed data.

The WBoPDC network has a greater number of key performance measures, not all of which are associated with the integrity of the highest value assets. In addition, many maintenance activities on Transit's network required to meet its Operational Performance Measures (refer below) are incorporated into key performance measures under the WBoPDC system. Accordingly, there are a larger number of key performance measures applying to the WBoPDC network. Some incorporate more than one condition or fault into an overall index, for example the 'Surfacing Defects Index' which is a single measure for all pavement and surfacing faults.

2.5.3 Underpinning of Key Performance Measures

When evaluating tenders for long term maintenance contracts, there can be large differences between the tenders in the quantum of rehabilitation and re-sealing proposed. Whilst a tender that includes the largest quantum of work may not have the most cost effective maintenance strategy for the network, all other things being equal, such a high work output programme offers a reduced risk of under-achievement of key performance measures.

On previous PSMC contracts, Transit has incorporated a key performance measure that locks in the tendered minimum quantities of the 'big ticket' pavement rehabilitation and re-surfacing items.

If the Contractor subsequently is able to reduce the quantum of work and still meet the performance measures, the savings can, by negotiation, be used to provide other services under the contract.

Having considered Transit's approach, the WBoPDC agreed to adopt the underpinning of rehabilitation but not re-surfacing.

2.5.4 Operational Performance Measures

As noted above, Transit's PSMC model has key performance requirements that protect the value of the key pavement and surfacing assets. The remainder of the maintenance activities, which generally ensure the serviceability of the assets from the point of view of the road user, are covered by operational performance requirements with a lower level of consequence for non compliance. Typically such measures have a contract standard which describes the minimum condition of the assets on a network wide basis, and a response time for rectifying individual defects.

WBoPDC performance measures are mainly all key performance measures, with relatively few operational performance measures.

2.5.5 Management Performance Measures

Transit's PSMC series of contracts have prescribed the management functions of the Contractor without requiring a system of compliance monitoring and associated non-compliance system. With the need to demonstrate customer satisfaction and performance levels for all services purchased by the WBoPDC, a series of Management Performance Measures was developed for all professional services under the Bayroads contract.

2.5.6 Safety Performance Measures

Transit's performance measures aimed at ensuring road user safety are designed to ensure a minimum asset condition, for example compliance with Transit's skid resistance policy and compliance with the Manual Of Traffic Signs And Markings.

The WBoPDC proposals incorporate a system for monitoring individual components, such as visibility from entranceways, as well as assessing compliance based on an overall index directly related to safety outcomes such as 'Percent [crashes] With Road Related Factors' and 'Social Cost'.

2.5.7 Development Performance Measures

As noted above, Transit intends to procure any capital works under separate contracts. However, with development in response to traffic growth seen as an integral part of management of the network, WBoPDC have chosen to include asset development within the Bayroads contract.

Development of the WBoPDC assets is driven by two types of contract requirements. In keeping with the philosophy of performance based contracting, where possible, asset development is driven by the need to maintain related performance measures (for example 'smooth travel exposure'; 'exposure to narrow carriageway'), rather than by the construction of pre-determined projects. However, the location, quantum and timing of some development such as seal and footpath extensions are prescribed in the Bayroads contract due to the need to meet commitments made to the community.

2.5.8 Total Number of Measures

The differences in approach between Transit and WBoPDC with regard to their respective performance measures resulted initially in around 80 separate performance measures, with only three being common to the two networks. Integration of the measures to provide a concise tender document and reduce compliance costs is discussed below.

2.6 Contract Risk Allocation

Both Principals accept the need to place a cap on the Contractors exposure to risks which are beyond its powers to manage, such as traffic growth greater than predicted, or extraordinary weather or other natural events. While the two Principals accept responsibility for similar types of risk events, the details of the risk allocation are quite different for the two networks.

2.7 Compliance Monitoring

Transit's PSMC contracts have incorporated self monitoring of compliance with all performance measures. This philosophy ensures that the Contractor cannot dispute the validity of the data. The Contractor's quality assurance system and random verification by the contract Superintendent safeguard against any improper manipulation of the data by the Contractor.

WBoPDC requires independent data collection for the Bayroads contract as this is considered to be more readily understood and acceptable to its rate paying customers should a dispute ever arise with a customer regarding the performance of the Contractor.

2.8 Carrots And Sticks

Transit's PSMC contracts incorporate a non-compliance system whereby there is no penalty on the Contractor for identifying its own non-compliance, provided that such non-compliance is rectified in accordance with the contract. Another principle embodied in Transit's PSMC contracts is that there are no adjustments to payments in the event of non-compliance as this would reduce the ability of the Contractor to improve its performance.

Transit's approach might appear to ratepayers or others not familiar with the PSMC philosophy as being biased in favour of the Contractor. For this reason the WBoPDC performance measures in some cases incorporate deductions for under achievement.

Over achievement which results in road user benefits (for example road roughness) is considered by Transit to be a desirable outcome on its PSMC contracts, and a previous contract offered a bonus for performance in excess of a certain threshold for selected key performance measures.

Because their network generally has lower standards and traffic densities (compared with the highway network) yet is facing growing traffic volumes, the focus for the WBoPDC is on reducing the cost of providing the basic acceptable level of service whilst investing any surplus funds in the development of the network. Accordingly, they are not interested in paying a bonus for over achievement on their KPM's.

3. INTEGRATION

3.1 Documentation Objectives

3.1.1 Clear And Concise Contract Documentation

Having ascertained the many and varied requirements of Transit and the WBoPDC, BBO undertook the task of integrating the requirements into a single contract document. BBO were concerned that the large number of performance criteria and measurement systems might render the documents confusing. Achieving simplicity and clarity was a major challenge and required considerable attention to the architecture of the document.

3.1.2 Maximum Commonality In The Requirements For The Two Networks

Ideally, if the same performance requirements and management structures were applied to both networks then management and compliance costs would be minimized. However, it was soon recognized that total integration of all services would not be practical given the different needs of the two networks. In addition, integration of some services or contract conditions would require compromises that neither Transit nor WBoPDC was prepared to make. Nevertheless, opportunities were taken to use common requirements wherever possible.

3.1.3 Incorporate The Best Features Of The Transit And WBoPDC Performance Measures

Separate development of performance measures by Transit and WBoPDC has resulted in some differences in approach to performance based maintenance. The Bayroads contract represented an opportunity for both networks to benefit from the best concepts from tried and trusted performance measures as well as new and innovative ones.

3.1.4 Incorporate The Strengths Of Transits Successful PSMC Contracts and Implement Improvements

A further objective of the Bayroads drafting process was to utilize tried and proven features of Transit's existing PSMC contracts and implement further improvements based on lessons learned from their implementation to date.

3.1.5 Ensure Equality And Value For Money For Both Principals

Consideration had to be given to ensuring that neither Transit nor the WBoPDC District Council would be subsidizing the others services or otherwise disadvantaged, either through the tender process or through the course of the contract.

3.2 Performance Measures

Three options were considered for the integration of performance measures. These were: the retention of all separate Transit and WBoPDC performance measures without alteration; use of the same performance measures for both networks using a combination of the best features of both ('total integration'); and a combination of the two extreme approaches, integrating where practical and otherwise using separate measures for the two networks.

A perceived weakness of the first approach was the likely complexity of the resulting documentation which would be difficult for tenderers to assimilate in the time available. On the other hand, the WBoPDC has involved potential bidders in industry group meetings as the performance measures were developed, which was expected to give them a head start in understanding the tender document.

The total integration approach was soon found to be unsuitable on account of the significant differences in the management of the networks and services required, as described above. The total integration approach would have resulted in too many compromises for each network.

Extensive consultation and discussion with the two Principals was undertaken to remove unnecessary measures, apply common measures where suitable, and improve

measures where there might be difficulty in establishing compliance (for example, due to the method of measurement not being sufficiently repeatable, or due to compliance being influenced by factors beyond the control of the Contractor).

The final suite of performance measures largely retains separate measures for the two networks. Transit's system of labeling was adopted after much debate, resulting in Management Performance Measures (MPM's), Key Performance Measures (KPM's) and Operation Performance Measures (OPM's). Grouping of performance measures under the three labels is not carried out merely to provide a tidy reference system, but is important in identifying the non-compliance system applicable to the measure (refer below).

3.3 Compliance / Non-compliance Systems

Transit's PSMC systems for establishing compliance with performance measures have been adopted for the Bayroads contract. The Contractor is required to establish its own system for monitoring and reporting compliance and ensuring that corrective actions have been implemented. This compliance monitoring is supplemented by reviews by the Superintendent.

Unlike Transit's PSMC contracts where data for the monitoring of all performance measures is collected by the Contractor, the Bayroads contract includes both self measurement and independent data collection (refer below).

In the event of non-compliance, except in the case of KPM's incorporating WBoPDC development works, the Superintendent issues non-compliance notices rather than imposing financial penalties. A Minor Non-Compliance Notice is issued for failure to meet MPM's and OPM's, with a Major Non-Compliance Notice issued for failure to comply with KPM's beyond a specified tolerance margin (for which a Minor Non-Compliance Notice would apply), or in the event of multiple minor non-compliances not being closed out.

The contract may be terminated by the Principal in the event that the allowable number of Major Non-Compliance Notices open at any one time is exceeded.

3.5 Conditions of Tendering

Payment for the services undertaken on each network are separated out for payment by each Principal. The Conditions of Tendering require tenderers to provide verification that the tendered Lump Sums for the Transit and WBoPDC networks have been fairly apportioned.

3.6 Conditions of Contract

The Bayroads Conditions of Contract were modified from those developed for Transit's PSMC contracts to recognize the two entities acting as Principal, and establish the liabilities of each under the contract.

3.7 Basis of Payment

Transit's Basis of Payment for PSMC contracts was expanded to incorporate the specific requirements of the Bayroads contract. This included linearly increasing lump sum payments for the WBoPDC network (as opposed to equal installments for the Transit network), payments by the Principal for its share of the Data Collection Contract, deductions for lane rental on the WBoPDC network and deductions for failure to meet performance targets for WBoPDC development KPM's.

There are no bonuses to be paid under the contract.

3.8 Maintenance Specification and Appendices

The Maintenance Specification and Appendices describe the services to be performed and specify the performance measures and compliance monitoring systems described above.

These sections were drafted by BBO using base information supplied by Transit and WBoPDC asset managers and subjected to processes of review and checking by the various stakeholders.

4. CONCLUSIONS

Some aspects of the integration of the requirements of two separate and fundamentally different road networks and two different contract Principals into a single performance based contract have been described above. Feedback to date suggests that the documentation objectives have been met. It is hoped that the document will result in positive outcomes for the two Principals, Contractor and all other stakeholders throughout the 10 year term of the contract.