

Maintenance and Operations Review

Procurement Task Group – Discussion Paper

1 Introduction

This paper presents some options for discussion on the various procurement related parameters including, network segmentation, delivery models, contract tenure and performance drivers.

This paper looks at the current status of network segmentation, contract expenditure and the shape of the supply market. It also provides for three potential segmentation options for discussion.

The challenge to the procurement task group was;

- To find ways of contributing to the reduction of maintenance operations and renewals costs,
- Identify ways of working more collaboratively across the Industry resulting in better value for money outcomes and higher levels of customer satisfaction in the long term,
- To introduce better performance incentives to achieve best whole of life outcomes, and
- To ensure our legislative duties were not compromised in regards to section 25 (2) of the Land Transport management Act.

The development of the outcomes derived from this report, considered three sources of research and analysis, these being;

- International approach to procurement of maintenance and operations, researched through a literature review,
- Regional opinion of current practise and what could work better, obtained through interactive sessions within each of the four main regions, with the NZTA regional staff and with Industry representatives,
- A qualitative and quantitative network delivery model performance assessment on current NZTA management areas, utilising financial, safety statistics, network condition and contract performance data.

Through these three areas of consideration, improvement options have been developed on various procurement related parameters.

In developing the various procurement related options consideration was given to the recommendations from the Office of the Auditor General Report “New Zealand Transport Agency: Information and planning for maintaining and renewing the state highway network 2010” and NZTA State highway Portfolio Procurement Strategy 2010.

The Procurement task group options paper has been developed independently of the Road Maintenance Task Force 2012 – review of road maintenance regime report, but does take cognisance of the discussions within the Task force relating to collaboration, suppliers, procurement and competition.

The various options proposed in this paper have been developed through a consultative process with representation from the supply chain.

2 Current Status

Figure 1 provides a breakdown by Region and Network Management Area (NMA) of the current number of contracts in place to manage the delivery of the maintenance and operations budget.

Figure 1 Current number of maintenance and operations contracts

Region	Auckland	Waikato		Wellington			Christchurch		
Minor Region		Tauranga		Napier		Palmerston North	Marlborough		Dunedin
NMA	3	4	4	2	2	2	1	3	3
PS Contract	5	4	3	1	5	3	1	4	4
Highway Maint	4	4	7	2	3	2	2	8	5
Other Maint Contracts	1	8	5	10	1	2	0	2	9
Total Contracts	10	16	15	13	9	7	3	14	18

Note: Other maintenance contracts only include those specific contracts such as but not limited to vegetation control, pavement marking, annual reseals and rehabilitation, they do not include safety or one off projects.

The NZTA has divided the country into 25 network management areas (NMA's). Each area has a dedicated NZTA asset manager in place to manage both contractual and relationship issues with suppliers and customers. NMA's are in some cases further divided into more than one network maintenance contract area. For example South Canterbury has one consultant to manage the NMA but has two network maintenance contract areas with two separate contractors.

Depending on the contract model determines the level of input required by NZTA to manage the contract. In a traditional contract the NZTA representative will manage a consultant who in turn will manage the contractor. In a Hybrid contract the NZTA representative has more input into both the consultant and the contractor's activities. In a PSMC, the NZTA representative manages the performance of the contract rather than specifically the contractor. In an Alliance all parties work together to deliver the level of service.

As of March 2012 there are currently:

- 37 Highway maintenance network term contracts (includes incident response),
- 19 separate network management professional services contracts, one of which is managing the Auckland Traffic Operations Centre,
- 11 separate Bridge Management professional services contracts specific to managing the state highways structures,
- 12 NMA's are operating at least 58 various forms of traditional contracts in any one year (note this number is variable dependant on the number of reseal and rehabilitation contracts and excludes other minor works contracts). Of the total 58 traditional contracts, 3 are full fence to fence, the remaining contracts are a mix of pavement maintenance, incident response, traffic services, vegetation control, pavement marking, highway lighting, reseals and rehabilitation contracts,
- 4 network areas and the Auckland Harbour Bridge (AHB) are operating in a Performance Specified Maintenance Contract (PSMC) environment,

- 1 Alliance contract to manage and maintain Auckland’s motorway network. Furthermore the Auckland region has commenced commercial negotiations to include the Auckland Harbour Bridge (AHB) as a sub-alliance within the Auckland motorway alliance,
- There is currently 7 NMA’s operating 11 Hybrid contracts.

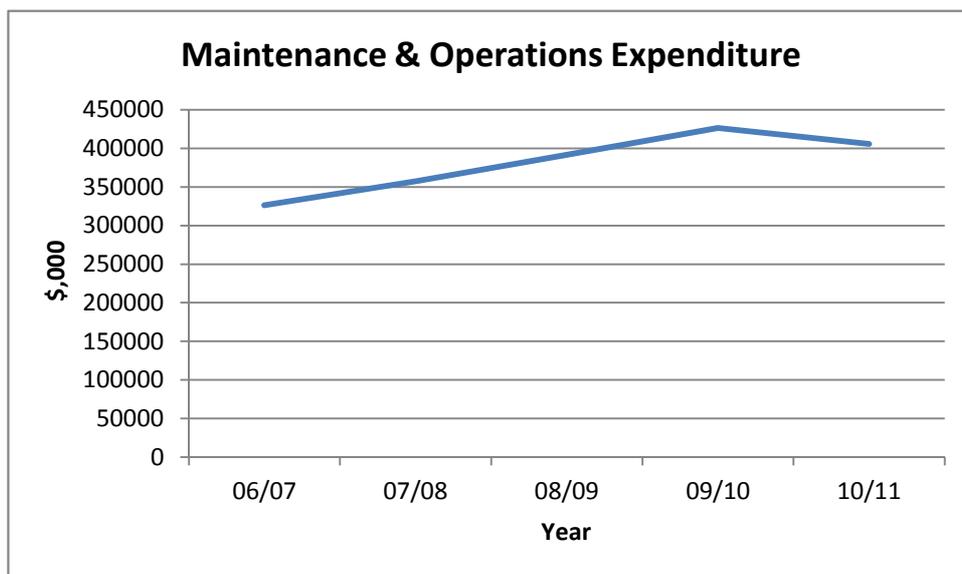
Prior to 2009/10 the maintenance and operations expenditure had been increasing at approximately 8% per annum for the last 4 years, in 2010/11 there was a levelling off of this expenditure profile (refer figure 2). The average annual expenditure over the last 5 years has been of the order of \$382 million, this excludes non-NMA expenditure.

It should be explained that the non-NMA expenditure covers regional costs such as planning and legal issues, specialist works including traffic counting, network controls and overweight permitting and it also covers national office maintenance and operations specific expenditure. The overall maintenance and operations expenditure is approximately \$500 million per annum.

The financial analysis throughout this report does not include emergency works. However incident response is included in the analysis and if a region was unsuccessful in their application for emergency works funding then the costs to manage an incident will have been analysed.

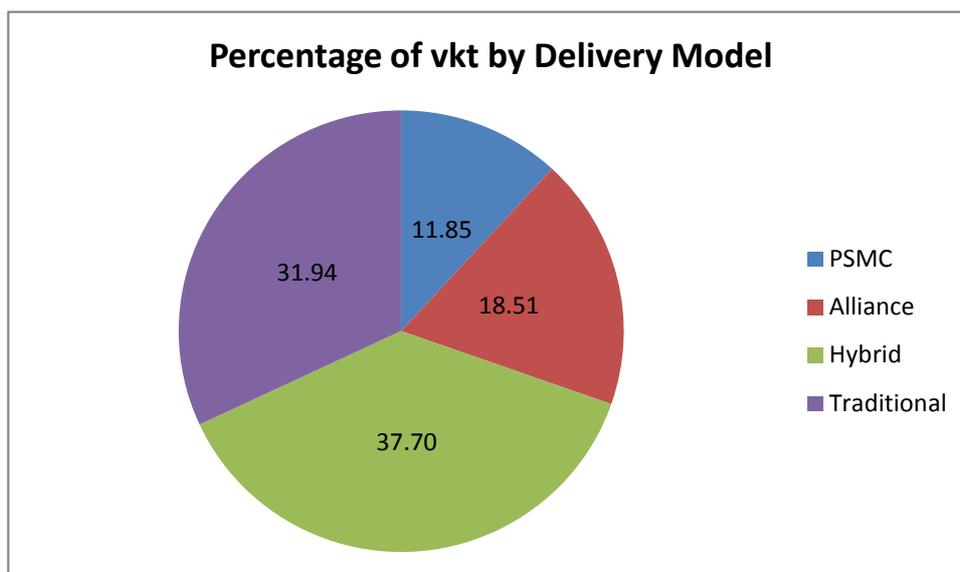
This equates to an actual national annual average maintenance spend of \$19.34/1000vkt or \$19,640/lane km.

Figure 2 NMA maintenance and operations expenditure



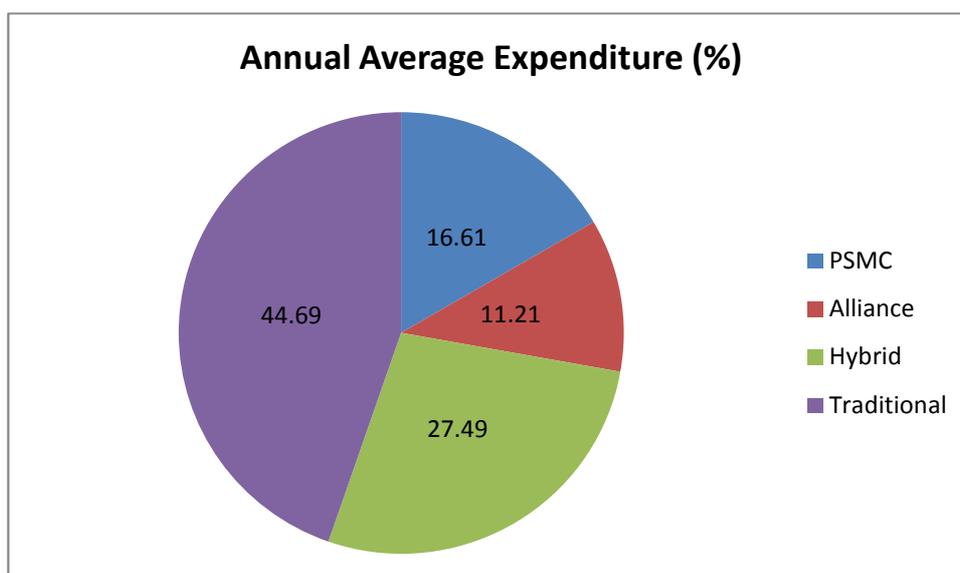
When comparing the vehicle kilometres of travel (vkt) by delivery model (refer figure 3) we see that the hybrid model carries the greatest overall proportion of traffic movement, being 37.7% of the national vkt figure. When compared to the number of NMA’s utilising a hybrid delivery model this represents 29% of the contract types.

Figure 3 Percentage of vkt by delivery model



If you look at the annual average expenditure as shown in figure 4, (averaged over the last 5 years) then the greatest expenditure (45%) occurs within the traditional network delivery model which carries 32% of the national traffic movements.

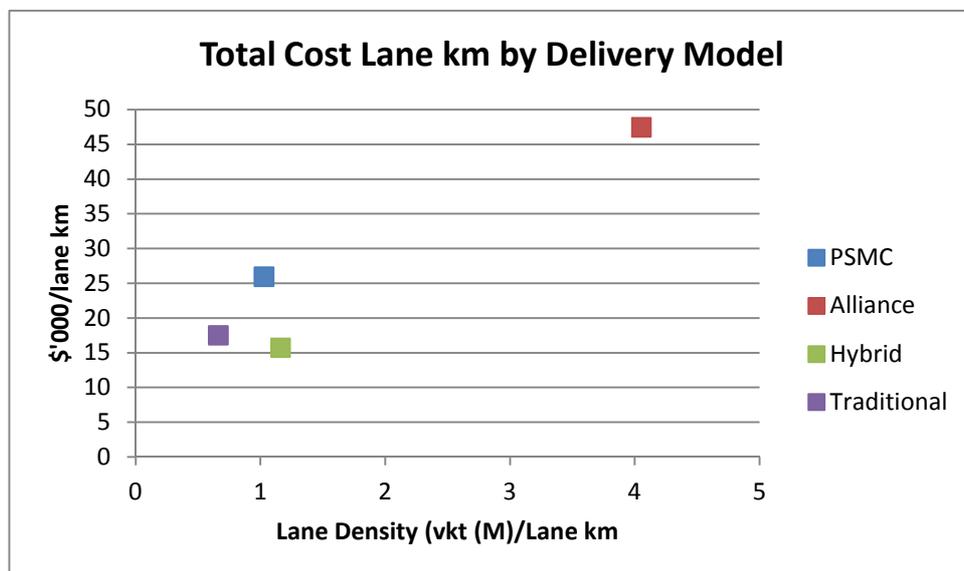
Figure 4 Percentage of annual average expenditure by delivery model



Looking at this another way, the ratio of vkt to expenditure then the Alliance has the lowest ratio at 0.61 followed closely by the Hybrid (0.73) and then at nearly twice this ratio are the PSMC and traditional contracts at 1.4 each. The reasons for the variations are not obvious but in part can be explained through varying levels of service within each of the delivery models, the asset preservation strategy of the PSMC and the pricing strategies employed within a traditional schedule of prices to target specific work types. One example of the varying costs within the different delivery models can be observed in the pavement rehabilitation works, where the PSMC and traditional models have an average expenditure profile of \$4200/km and \$3200/km over the full length of the NMA respectively, compared to the hybrid which has an average expenditure profile of \$1750/km.

Another way of viewing the data is to look at spends per lane km against lane density (vkt/lane km) or lane utilisation. If we consider this in terms of maintenance of the state highway, then the increased utilisation of the road corridor should likely result in increased maintenance expenditure, as the utilisation decreases so should the expenditure. Figure 5 shows the average cost per lane kilometre (includes expenditure for both professional services and physical works) plotted against lane density for each delivery model.

Figure 5 Total cost (PS & PW) by delivery model



Given that we have only one contract to define an average data point for the alliance it is hard to draw an accurate analogy. However given the lane density is approximately 4 times the average density of the hybrid and PSMC the Alliance is only three times the average expenditure of the Hybrid and less than twice that of the PSMC. Of interest is the higher than expected average expenditure on our lower density highways which are generally attributed to traditional delivery models.

While Figure 5 shows the average plot for each model type by spend per lane km versus lane density, the plot of individual NMA's as shown in Figure 7 provides some very good correlation trends for each model type and comparison between networks with similar densities. For example Figure 6 below shows a comparison between similar network lane densities for each delivery model type (excluding the Alliance).

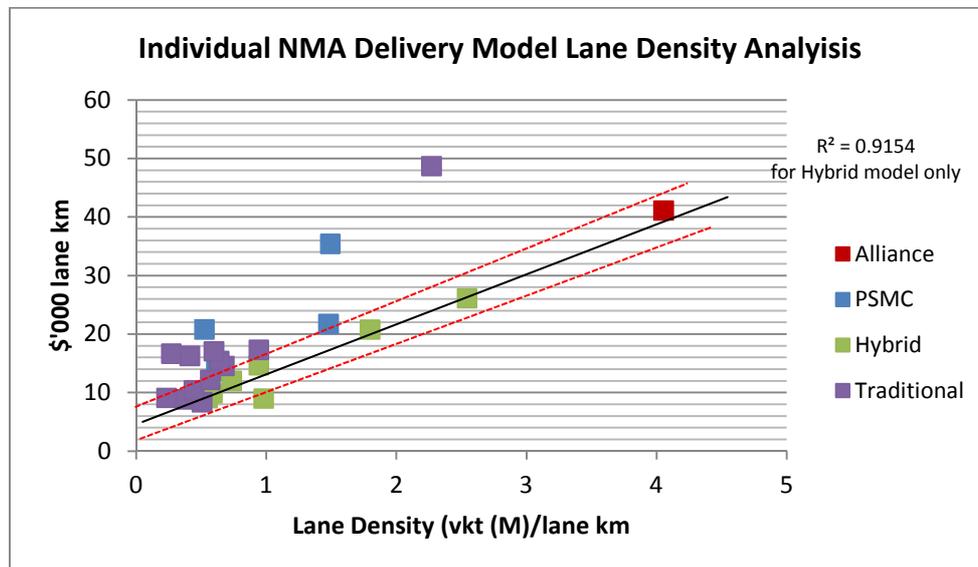
Figure 6 Comparison between similar NMA lane densities by delivery model

Model	NMA	Lane Density (vkt(M)/lane km)	Expenditure (\$'000/lane km)
Hybrid	Marlborough	0.59	9.9
Traditional	Nelson	0.60	17.1
PSMC	Northland	0.61	13.8

Figure 7 shows the overall spread of each individual NMA's by expenditure and lane density for each delivery model type. The coefficient of correlation for hybrid contracts is 0.92 over a good spread of lane densities (0.5 to 2.5). Accepting that there are a few traditional models that fall just within the spread of hybrid points (refer red lines Figure 7) any assumed benefits from moving these from a traditional contract model to a hybrid contract model are likely to be small. However, there are a number of traditional areas where spend per lane km versus lane density is outside an acceptable limit. By using linear regression analysis we can estimate that changing the contract model for those networks from traditional to hybrid could reduce expenditure by \$19.8M per year (note this estimate is

conservative as it assumes savings to the upper bound of an acceptable limit). In addition further expenditure reductions could be realised from all but one traditional contract if the median regression line was used.

Figure 7 Comparison between all NMA lane densities by delivery model



The implication of the analysis highlights the financial benefits that could be realised from moving from multiple traditional contracts to a fence to fence maintenance approach, other benefits from this approach are noted further.

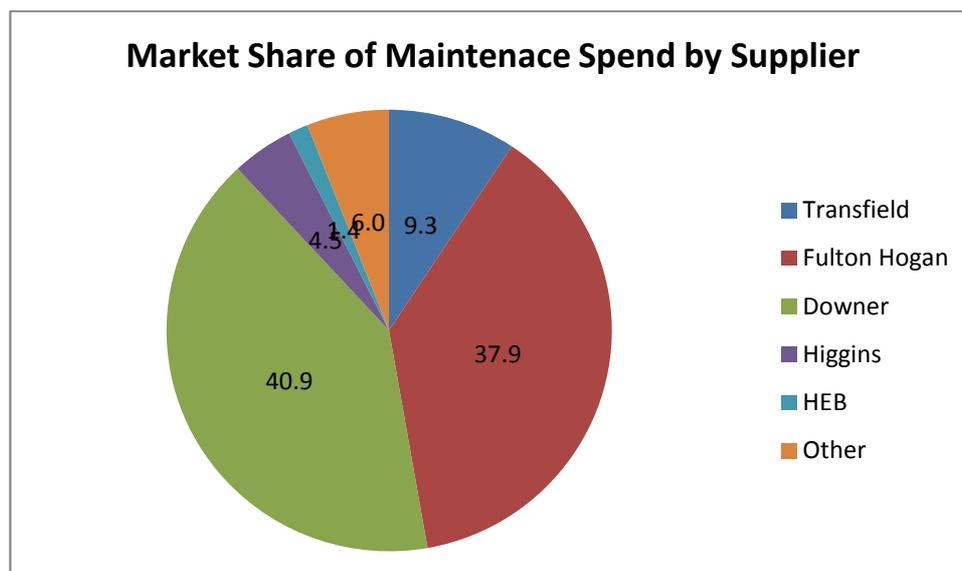
With respect to the PSMC contracts, there could be an assumed reduced expenditure if a more conservative pavement preservation approach as utilised in the hybrid model was replicated in the PSMC.

Overall a potential conservative annual reduced expenditure of 5.2% could be realised if all traditional NMA's were changed to the hybrid contract model.

While spend and network dynamics are key considerations, analysis of the supply chain when compared to contract delivery model requires further discussion.

When analysing the main suppliers in the market and their respective share of the spend, there is notably a lot of variability from the different data sources. A general rule of thumb has been applied to analysing the market share, that is, the contractor which holds the maintenance contract has been credited with the full spend for all activities. In most cases this is reasonable but for the traditional contracts isolating the individual annual contracts or minor activities is very difficult.

Figure 8 Financial share of maintenance market by supplier



What the maintenance share spend profile indicates is that there are two main contractors Fulton Hogan and Downers which share the majority of the market spend. They are both large companies, and have been involved in and grown in the New Zealand market over an extended period. There are three other moderate sized suppliers who play a smaller role in the maintenance market, with numerous other smaller suppliers making up the full range. Of these medium to small suppliers there is a mix of relatively new entrants, international companies, larger capital improvement focussed suppliers, and Local Authority Trading Enterprises.

While the data shows that there is a dominance of two suppliers in the maintenance market, their share of the market has not increased significantly over the last 10 years. Of note is that the other three identified suppliers have grown their share proportionally more.

Current evidence indicates that smaller suppliers have a relatively limited input as lead contractors in the state highway maintenance and operations market, that is to say that of the total 6% which represents other contractors 3 (South Roads, Sicon, Fergusson) are the only other players in highway maintenance work activities. The remaining small suppliers that make up the other 2.5% of the total annual spend are primarily in the traffic services activities, such as vegetation control, pavement marketing and highway lighting.

However it should be noted that the importance and revenue stream of small suppliers is significantly more influential in the sub contracting area. Information provided by the five key physical works suppliers show the following percentage spends on sub contractors:

- Fulton Hogan, 30 to 35%, (note includes local authority works)
- Downers, 19%
- Transfield, 50 to 70%
- Higgins Contractors, 19% and
- HEB Contracting, 33%.

The four different delivery models all have different mixes of suppliers for both professional services and physical works, there are currently in the;

- PSMC, three different professional service providers on each of the 4 PSMC's. The unique case is the Bay of Plenty West contract (PBC01) where Opus is the lead contractor with Transfield and Downer. In all the other PSMC's the contractor is the

lead. There are currently only 2 separate physical works contractors on the other PSMC's with Downers as a sub-contractor to Transfield on PSMC006.

- Alliance, three separate professional service suppliers are contracted into the AMA and one lead contractor, selected through a competitive tender process.
- Hybrid, two professional service suppliers with roughly a fifty-fifty share of the market. There are four physical works suppliers managing this form of contract with Downers and Fulton Hogan holding the majority.
- Traditional, two professional service suppliers, of which Opus have the market share (11 to 1) of the network management contracts. Smaller specialist services contracts such as the bridge management contracts include a number of smaller suppliers and have already been aggregated to larger areas of management. Of the 21 highway maintenance contracts, there are currently 6 different physical works contractors, with 15 (76%) of these contracts being managed by Downers or FH. Of the other traditional activity contracts such as but not limited to vegetation control, pavement marking and highway lighting there are 18 smaller contractors who share in 2.5% of the overall maintenance and operations expenditure.

Given that the traditional contracts have the greatest number of individual contracts to manage and have the greatest level of consultant input this could infer a greater ratio of professional services spend to total network expenditure. It should also be noted that a proportion of professional services expenditure relates to direct customer interaction which could be influenced by population base and vehicle kilometres of travel. When analysing the average annual actual professional services spend the traditional contracts equates to 11.9% of the total actual contract spend. In contrast the Alliance is the highest at 14.1% followed by the traditional contract, then the PSMC at 10.4% and lastly the hybrid at 9.4%. There are issues in extracting the real cost of Professional Services, from the PSMC contracts in particular, so these figures may be somewhat misleading.

While the Alliance has the greatest input from professional services this is offset by the lower physical works spend when analysed through selected network ratio profiles.

To this end the traditional contracts are costly both in terms of professional services and physical works spend. A value chain analysis exercise was undertaken on a traditional contract and considered the reactive maintenance task which identified a significant degree of repetition and waste. On the other hand the hybrid has the lowest ratio spend for professional services and dependant on the network ratio profile, assessed the lowest or near lowest physical works spends.

The issue of competition and sustainability are key aspects of section 25 (2) of the LTMA and the NZTA need to ensure that a healthy competitive market is maintained. To balance this the NZTA need to ensure that competition is also sustainable.

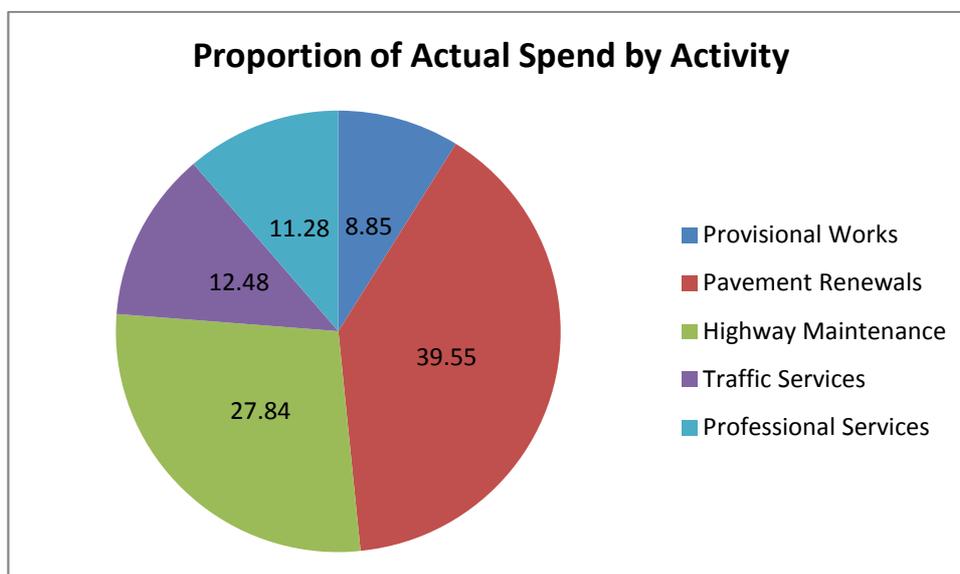
In 2010 the NZTA carried out a Physical works sector health check and capability review. The review was initiated by industry and justified on the basis that the economic downturn in early 2008 had in part increased competition for NZTA projects resulting from a reduction in local authority and private developer works. The impact of the increased competition resulted in an increasing trend of unsustainable margins as suppliers endeavoured to secure work volume to sustain their personnel resource.

As a consequence of the increased market competition and corresponding low tender prices there was an impact on the quality of works and an increase in MSQA costs. One example of this was the Nelson highway maintenance contract which was tendered well below the engineers estimate and additional funding was allocated to increase contract surveillance.

The issue of redundancies in large suppliers versus loss of small to medium supply companies was hotly debated. Large suppliers were concerned about losing knowledge and capacity they had built-up over the last few years while smaller suppliers provided a valuable sub-contracting resource and a competitive market for smaller regional projects.

The key then is to ensure competition now and in the future, suppliers have the capability and capacity to provide the required service and that competition for contracts return a sustainable margin for suppliers.

Figure 9 Maintenance and operations expenditure by maintenance activity



Looking at the physical works spend profile in more detail (refer Figure 9). The greatest proportion of spend in terms of contract activity is around the pavement renewals area with highways maintenance (including incident response) making up the other major proportion of the spend profile. It is noted that areas which have a high demand for winter maintenance response do show a higher proportion of expenditure in the highway maintenance activity.

Looking at this another way, our biggest spend is on pavements and achieving the right balance between pavement maintenance and pavement renewal is a key task for both our suppliers and NZTA. Currently the performance based models have targeted improving network condition indicators, such as roughness and rutting while the traditional has generally been more reactive focused. While NMA have varying strategies on the acceptable ratio of reactive pavement maintenance to pavement renewals and while there is variability within similar delivery models, on average the last 5 years financial expenditure supports the view that performance based contracts spend less on reactive pavement maintenance compared to pavement renewals. In particular the PSMC has had a high proportion of underpinned quantities to renew network pavements, while the hybrid has been more conservative in their approach to managing pavement condition. The traditional model has generally suffered under funding limitations as the quantities indicated in the schedule of prices are indicative rather than contractual. To this end the traditional spend profile is often less than other contract forms due to NZTA funding interventions. With this in mind and with reference to Figure 5 earlier, it is surprising to see the traditional model costs trending higher than the Hybrid model, when quantities in the former have generally been reduced to match funding constraints, whilst underpinned Hybrid quantities have in most cases remained unchanged during the same period.

Prior to the commencement of the M & O review both the Auditor General's report (2011) and the NZTA Procurement Portfolio Strategy (2010) identified the need for assessing the performance of the various delivery models. The mechanism for assessing the overall performance of the various delivery models was based around a number of criteria, including but not limited to network condition performance indicators, network spend compared to a national average for selected activities, the change in spend profile over a five year period, safety performance, supplier performance, NZTA management capabilities and the combination of the overall network complexity working environment.

The scoring criteria for network condition performance penalised networks where their level of service was greater than the State highway Asset Management Plan (SHAMP) level of service and was continuing to show an improvement. The highest scores were assigned to those networks where the level of service was at or near the SHAMP and in a steady state.

The final delivery model performance score was an overall assessment of qualitative and quantitative measures; the outcome of the assessment showed:

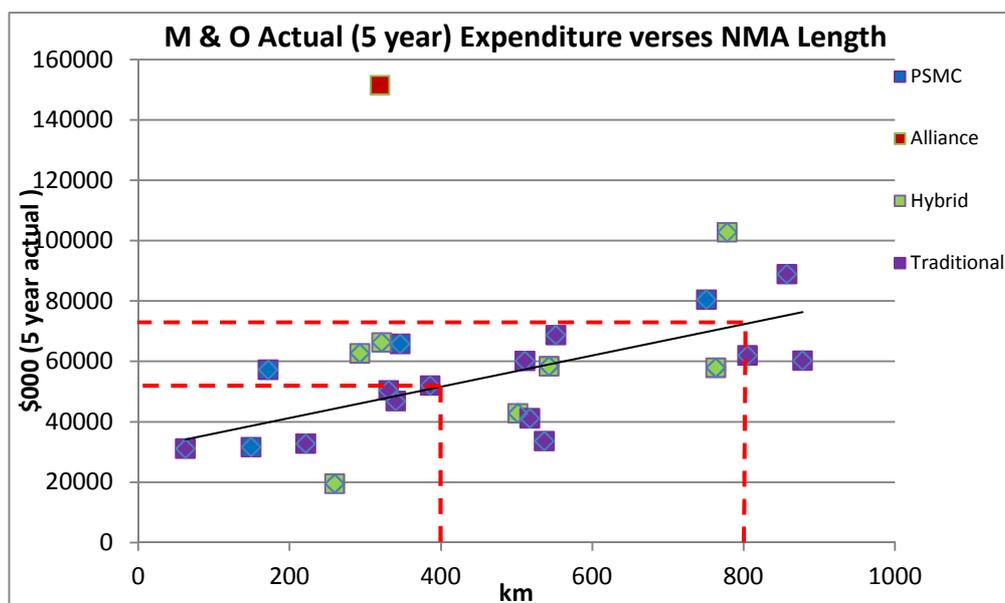
- The Alliance had performed well but this was based on one contract only, and notably costs have been high for professional services,
- The Hybrid had performed well but there was some variability between the different networks,
- In general the PSMC had performed reasonably well, but not as well as the Hybrid contracts,
- The Traditional contracts showed the greatest degree of variability but in general resulted in performances similar to the PSMC.

The final area of assessment that need's to be analysed is the current relationship between network size and expenditure.

While the NZTA financial system requires one work unit linked to one contract, regions tend to manage their maintenance expenditure at the higher NMA level to better balance overall contract expenditure, rather than breaking down into individual work units for individual contracts. However, in most cases network maintenance contracts and delivery models align with NMA, and therefore the analysis has been focused at this level. The following chart looks only at the NMA actual maintenance and renewals expenditure (excludes improvements and incident response) for the last five years compared to the NMA length.

It could be argued that aggregating smaller networks into a single network distorts the overall cost of the larger networks and while this is the case it is likely that any results favouring larger networks could potentially understate the maintenance expenditure efficiency savings.

Figure 10 NMA maintenance and operations expenditure by network length



When plotting actual expenditure against NMA length (refer Figure 10) the coefficient of correlation ($R^2 = 0.41$) indicates that a fair portion of network expenditure is driven by other factors. Therefore, as you filter out various other network factors the correlation improves. For example filtering on NMA's which;

- Are North Island and South Island results in a coefficient of correlation for the North Island of 0.64 and 0.49 for the South Island,
- Have greater than 20% urban areas results in a coefficient of correlation of 0.94 between expenditure and network length (note the Auckland Motorway Alliance has been excluded from all established trends as it is seen as a unique network not comparable to others) and confirms that urban areas require a different approach to maintain,
- Are traditional models, have less than 20% urban areas and only one maintenance contract results in a coefficient of correlation of 0.97.

To draw some simplistic analogies, if the network length increased from 200km to 400km or 400km to 800km that is a doubling of the network length the corresponding network maintenance expenditure does not increase proportionally.

As noted above there are various network factors which further influence maintenance expenditure. However, which ever way you filter on these network factors to improve the correlation relationship the same recurring trend is evident. That is as network size increases the corresponding network expenditure does not increase proportionally.

Of particular interest is the relationship between urban and rural areas. Further consideration has been given to understanding the relationship between urban and rural areas. For those areas with urban/rural ratios greater than 20% a different spend profile has been identified. Earlier analysis around lane density also highlighted that as the urban percentage increased not surprisingly so did the vkt.

Figure 7 showed two quite distinct bands when analysing NMA by lane density (vkt/lane km). Those which have a lane density less than 1.0 and this represents 75% of our current NMA's and those which have a lane density greater than 1.5.

When looking at only those networks which have a lane density of 1.5 or greater the correlation between expenditure and network length is low. However when analysing expenditure against lane kilometre there is a much more evident relationship. The purpose of this analysis was to see if increasing the network length resulted in reduced maintenance expenditure.

The outcome from this analysis concluded that as network lane length increased the maintenance cost expenditure did not increase proportionally.

This further analysis of urban networks supports the earlier hypothesis that applying a linear regression trend line to a data set such as that as shown in Figure 10 has merit and a generalised assessment of expenditure to length can be interpreted.

While evidence is unable to state the maximum size a network continues to show efficiency savings we can postulate that under our current network configurations the maximum network size of 861km still shows positive benefits.

While we do not have specific data at a network maintenance contract level for expenditure, we do have data on the network length at this level. Figure 11 shows the proportion of our current network maintenance contracts broken down in bands. The bands selected are below 200km, 201 to 500km, 501 to 750km and greater than 750km.

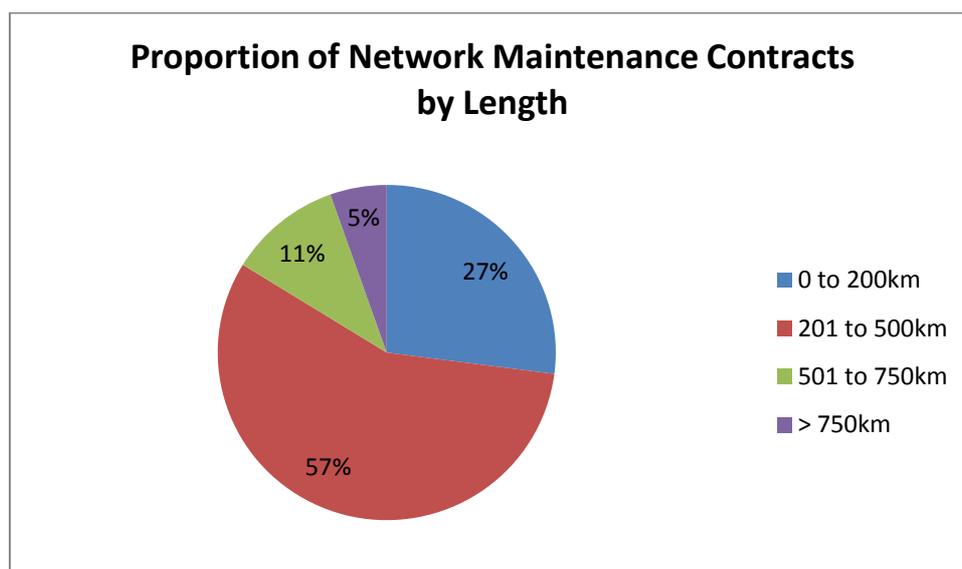
Of note, is that over 80% of our existing network maintenance contract areas are less than 500km. Given that suppliers have indicated to maximise the effectiveness and efficiency of their operation they need network sizes greater than 500km, anecdotal evidence indicates resources are being under utilised. If we look at it In terms of actual numbers of maintenance contracts, 31 (84%) of the 37 network maintenance contracts could realistically

return efficiency savings if their network size was increased. One exception to the 31 may be the Alliance, where lane kilometres significantly scale up the network size.

For example, if we reduced the number of networks from 37 to 21 we could realistically expect overall reduced maintenance cost expenditure.

One way to show this is through a theoretical analysis based on the current data. Currently the average network size for contracts less than 500km is 248km, using a conservative approach on the data displayed in Figure 10, a network of length 248km has an estimated spend of \$32.8M over a 5 year period. Doubling the network size to 500km would equate to a theoretical spend for the network of \$57M for the 5 years. This means halving the number of small networks could potentially return an efficiency saving of 13%.

Figure 11 Percentage of network maintenance contract areas by length



While theoretically there is potential for significant efficiency savings from increasing network size the reality may not be as dramatic. What the analysis does indicate is that we have a significant number of small networks which if aggregated would likely result in reducing our overall network maintenance expenditure. While simplistically this seems an easy exercise some allowance for the varying network characteristics (topography, traffic management, urban areas) need to be taken into account.

3 Network Segmentation

3.1 Problem Statement

Some of the existing networks operate inefficiently, and create significant administrative and tendering overhead costs due to smaller network sizes that do not readily support the optimal utilisation of resource.

3.2 Criteria

In order to establish what the most efficient solution is in terms of segmenting the network into manageable contract areas, a set of criteria has been determined as follows:

- a) **Traffic management demands:** avoiding where possible small areas of level 2/3 traffic management being included in contracts, noting the need this creates for specialist traffic management equipment that is likely to be under utilised.
- b) **Expenditure:** consider the predicted expenditure on each network area and the financial viability concerns and overheads structure associated with a smaller network.

- c) **Distance from population centre:** analyse population bases, and the ability to attract appropriately skilled staff to service contracts from logical locations within a network area and provide appropriate resources.
- d) **Network lengths:** consider the overall network size as an indicator of network viability, noting that smaller networks may be inefficient. An ideal network length of minimum 500km in predominantly rural areas was considered a reasonable target in most cases (noting that the arguments differ in denser urban areas such as the Auckland and Wellington networks). Consideration should also be given to the network connectivity to minimise repetitive travel.
- e) **Topography:** Consider key topographical features such as mountain passes, gorges or areas where winter maintenance or emergency events are prevalent. Consider the relative merits of dividing or combining such areas.
- f) **Complexity:** Recognise the differing maintenance and operational demands of rural and urban networks, and the potential need to rationalise network areas which include a proportion of both.
- g) **SH classification and Local (or Regional) Authority collaboration:** Consider the varying level of service demands driven by the SH classification, and existing or potential new collaborations with Local Authorities.
- h) **Traffic Volumes:** Consider the varying maintenance demands from traffic volumes
- i) **Local Authority Boundaries:** Consider the current local authority boundaries as suitable contract boundaries, noting the impact to both client and stakeholder liaison.

3.3 Options

The principle of full fence to fence network maintenance contracts has been factored into the options development. Both the quantitative analysis and qualitative evidence has indicated greater ownership and stake in the overall performance of the network by the supplier, a more seamless operation to the customer and potential savings to NZTA. This then forms the Base option reducing the current overall number of physical contracts from over 100 to 37 but maintains the current status of 37 network maintenance contract areas.

Three other options were also developed looking at state highway networks being configured in different ways based on differing priorities to the criteria selection used above.

Some detailed assessment of the options is provided but as stated before no specific network boundaries have been agreed. Rather, some of the generic criteria considerations and thought processes are provided. The information has been divided for ease of presentation based on the four existing major NZTA business units. It is important to note that the assessment is not limited by these four existing management areas.

<i>Option</i>	<i>Base</i>	<i>Option 1</i>	<i>Option 2</i>	<i>Option 3</i>
<i>No. of Contracts</i>	<i>37</i>	<i>21</i>	<i>15</i>	<i>8</i>

It should be noted that in some cases specialist contracts are still likely and that with the inclusion of performance incentives or penalties around additional works then one off contracts, such as emergency works could be tendered in the open market.

3.3.1 Auckland Region

For the Auckland region the following table shows the existing contract arrangement, and the changes proposed under the 3 promoted options:

<i>Base Option</i>	<i>Option 1</i>	<i>Option 2</i>	<i>Option 3</i>
Auckland Motorways (AMA)*	Retain AMA in it's current form	Increase length of AMA to cover greater length of national strategic (HV) route.	Include all High volume National strategic routes connecting key cities and ports into a single

			network
Northland North	Merge into a single network	Merge remainder into a single network	Merge remainder into a single network
Northland South			
Auckland North			
Total: 4	2	2	2
Comments			
<i>Pros</i>	<i>Some additional efficiency expected from reverting to a single Northland contract. This could also make collaboration easier.</i>	<i>AMA currently geared up to manage high speed high capacity route should be able to achieve efficiency gains as good practice in place. Additional scope for innovation and savings</i>	<i>Provides a seamless connection between key economic growth centres. Ensures HV strategic route is managed to consistent level of service with particular attention to freight movement.</i>
<i>Cons</i>	<i>Includes a section of national strategic HV route.</i>	<i>Increased liaison with more local authorities</i>	<i>Need to set up an NZTA management structure to deliver services. It is highly likely that this contract would have the highest expenditure in the country.</i>

3.3.2 Waikato Region and BOP

For the Waikato and Bay of Plenty region the following table shows the existing contract arrangement, and the changes proposed under the 3 promoted options:

Base Option	Option 1	Option 2	Option 3
West Waikato X 2	West Waikato X 1	Include part of West Waikato into Auckland,	Combine in to a single contract excluding national strategic routes (noting BOP and coromandel networks covered later)
Central Waikato X 3	Central Waikato X 1	Combine East Waikato and Bay of Plenty and Rotorua x1	
East Waikato X 2	East Waikato X 1		
West Bay of Plenty (PBC)	Tauranga/Bay of Plenty x 1	Combine East Bay of Plenty and Gisborne into one network.	
Tauranga City			
East Bay of Plenty			
Rotorua			
		Create a Central area contract x 1	
Total: 11	4	3	1
Comments			
<i>Pros</i>	<i>Each of the 3 existing Waikato regional areas could be readily incorporated into single contracts. The Tauranga / BOP could similarly be merged into a single contract.</i>	<i>A strategic approach to manage a national strategic route with increasing freight demands. Opportunity for collaboration. Significant opportunity to achieve efficiencies from combining 4 to 6 networks. Allows for a single contract area with a winter</i>	<i>Networks of a very similar traffic demand are now combined. Contract boundaries have allowed for strategic population bases to be included. Work activity of a less demanding nature suited to middle tier contractors. Sufficient contract value to encourage investment</i>

		<i>maintenance focus</i>	<i>and growth in staff.</i>
<i>Cons</i>	<i>Complexities with existing TLA arrangements and the higher demands of the growing Tauranga network.</i>	<i>PSMC contract merges could be difficult to implement in the short-term with new PSMC's recently established</i>	<i>One contract area split into two parts</i>

3.3.3 Wellington / Wanganui / Napier / Nelson - Marlborough

For this region the following table shows the existing contract arrangement, and the changes proposed under the 3 promoted options:

Base Option	Option 1	Option 2	Option 3
Gisborne	Hawkes Bay unchanged, Gisborne and Eastern Bay of Plenty combined	Gisborne included in part of East Bay of Plenty x 1	Gisborne included in part of East Bay of Plenty x 1
Hawkes Bay		Hawkes Bay unchanged	
West Wanganui	West Wanganui, SH1 section moved to East Wanganui	Part of West Wanganui reduced in size	Create a central area contract
East Wanganui	East Wanganui	Extend north to cover greater length of National strategic routes as far a winter maintenance boundary.	
Wellington (incl Wairapa)	Wellington		Marlborough (extend contract south and west to form top of the south network area
Marlborough X 2	Marlborough x 1	Marlborough extend south and west to form top of the south network area	
Nelson - Tasman X 2	Nelson - Tasman x 1		
Total: 9	7	5	3
Comments			
<i>Pros</i>	<i>Consolidation of Marlborough and Strategy combines state highway classification into more consistent routes.</i>	<i>North Island consolidates highways of similar type. Reduces the number of contracts along SH1. Allows for implementation of alternate route through a number of connecting loops. South Island, Key focus on SH1 as well as alternate route for highway closures. Greater opportunity to attract appropriate staff to more remote areas. Small to medium urban areas allowed for in each contract area to allow establishment of a main depot.</i>	<i>North Island consolidates highways of similar type and function, with key urban areas connected and freight movement between two key ports. Reduces the number of contracts along SH1. South Island, Key focus on SH1 as well as alternate route for highway closures. Greater opportunity to attract appropriate staff to more remote areas.</i>
<i>Cons</i>	<i>Some networks still have a reasonable mix of different highway</i>	<i>Demands of the Wellington network into one large contract area could be under estimated</i>	<i>Very large contract area with a mix of varying highway classifications.</i>

	<i>classifications. Networks routes are more dispersed</i>		
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3.3.4 South Island

For this region the following table shows the existing contract arrangement, and the changes proposed under the 3 promoted options:

Existing	Option 1	Option 2	Option 3
North Canterbury X 3	North Canterbury 1	Reduce northern extent and extend further south x 1	Create a single central south island area
West Coast X 3	West Coast x 2	Reduce northern boundary south x 1	
South Canterbury X 3	South Canterbury x 1	South Canterbury x 1	
Coastal Otago	Coastal Otago	Combine parts of Central and Coastal Otago x 1	Create a single southern area
Central Otago	Central Otago		
Southland X 3	Southland x 1	Combine parts of Southland and Central Otago and all Milford x 1	
Milford	Milford		
Total: 14	8	5	2
Comments			
<i>Pros.</i>	<i>Plenty of potential to consolidate into larger networks.</i>	<i>Sectionalises the alpine range requiring resources to manage from two sides</i>	<i>Consolidation to single contracts as traffic volumes less demanding.</i>
<i>Cons</i>	<i>Several of the southern networks are serviced by smaller suppliers to the NZTA which are likely to be significantly impacted.</i>	<i>NMA's have a variety of different highway classifications. The national strategic SH1 is still broken down into 4 different contract areas</i>	<i>Overall network size and geographical spread could prove problematic from a single centralised management location. Winter maintenance demands could put significant pressure on a single contractor's resources, although Joint Venture arrangements may become more common.</i>

3.4 Selection Criteria and Options Assessment Matrix for Network Segmentation

While the options had been developed around specific network configurations it was felt that rather than putting forward the detail plans for discussion more benefit would be obtained from detailing a set of selection criteria for evaluating the various options. These criteria are thought to be the key criteria in differentiating between the options.

In consultation with the M&O working group it was agreed that the 13 selection criteria for assessing the various network segmentation options are in order of importance:

1. Results in **reducing overall costs** to all parties in the maintenance and operation of existing and new infrastructure assets.

2. Allows opportunity to utilise **asset management** expertise and **reprioritise funding** to areas of greatest need.
3. A more **consistent management** of similar sections of state highway.
4. Creates a scale and complexity that **attracts and retains** appropriately skilled staff with growth opportunities and **long term sustainability**.
5. Preserves opportunities for various degrees of **collaboration** between client organisations, that better match up the supply market and optimise economic factors.
6. Ensures a **competitive** and **sustainable** market.
7. Considers the primary purpose of the state highway and its contribution to both national and regional **route availability** and **congestion**.
8. Considers the **customers** overall expectation and experience.
9. Allows opportunity to explore and implement **innovative** concepts and **manages risks** that return benefits to all parties and the customer.
10. **Flexibility** to redesign future network configurations.
11. Resources are **effectively** and **efficiently utilised** and suppliers can benefit from current strong centres of labour skills and availability.
12. **Effect of change** to suppliers, stakeholders, and client organisations and the ease of implementation to realise perceived benefits.
13. Allows **the wider supply chain** to contribute to maintenance and operations activities.

Figure 11 is the options assessment matrix summary where each selection criteria has been ranked and weighted. Each option is then given a rating assessment of 1 (low) to 5 (high) for each of the options and adjusted according to the weighting.

Note the score developed for reducing overall costs (selection criteria 1) is based on evidence from three independent sources, being this report, the Rationale economic analysis report and the Price Waterhouse Coopers (PWC) report.

Figure 11 Options assessment matrix

Selection Criteria & Weighting	Base Option (37)	Option 1 (21)	Option 2 (15)	Option 3 (8)
1 (17%)	0.34 (2)	0.51 (3)	0.68 (4)	0.68 (4)
2 (17%)	0.34 (2)	0.68 (4)	0.68 (4)	0.85 (5)
3 (13%)	0.13 (1)	0.39 (3)	0.65 (5)	0.39 (3)
4 (10%)	0.2 (2)	0.3 (3)	0.3 (3)	0.4 (4)
5 (8%)	0.4 (5)	0.32 (4)	0.24 (3)	0.16 (2)
6 (6%)	0.24 (4)	0.18 (3)	0.12 (2)	0.12 (2)
7 (5%)	0.1 (2)	0.15 (3)	0.2 (4)	0.2 (4)
8 (5%)	0.1 (2)	0.2 (4)	0.2 (4)	0.15 (3)
9 (5%)	0.1 (2)	0.15 (3)	0.2 (4)	0.25 (5)

10 (4%)	0.12 (3)	0.16 (4)	0.08 (2)	0.04 (1)
11 (4%)	0.08 (2)	0.12 (3)	0.2 (5)	0.2 (5)
12 (3%)	0.12 (4)	0.09 (3)	0.06 (2)	0.03 (1)
13 (3%)	0.12 (4)	0.09 (3)	0.06 (2)	0.06 (2)
Total Unweighted	35	43	44	41
Total (Weighted)	2.39	3.34	3.67	3.53

The outcome from the options selection criteria favours a move toward larger network areas.

While the outcome from the options selection criteria supports a move to larger networks the short and long term impacts of the move need to be considered against the perceived benefits, as well as consideration of what mitigation measures need to be implemented. Using a semi-quantitative approach to risk management the following table captures our preliminary thoughts on what some of these risks are.

Number of Contract Areas		21	15	8
Risk #1	There is a risk that reducing the number of contract areas may result in reduced future competition	Moderate	Moderate	High
Mitigation			Consider limiting the number of contracts a single supplier can hold noting potential pitfalls of this approach.	
Opportunity		Initially there will be a highly competitive market to be successful		
Opportunity		Amalgamation of smaller players / joint ventures		
Opportunity			Increased buying power at all levels for both materials and suppliers	
Opportunity			Potential for overseas interest	

Risk #2	There is a risk that the regional contracting market will be adversely impacted and reduce contracting capacity for other NZTA and non-NZTA works	Moderate	Moderate	Moderate
Mitigation		Look at local authority contract sizes to ensure market opportunities exist at range of levels.		
Mitigation		Require resources to be only allocated to contract not shared between other contracts or regions		

Mitigation		Ensure tenders are staggered between local authority and NZTA contracts
Opportunity		Supply market will be more sustainable with realistic expectations of work packages

Risk #3	There is a risk that if changes are implemented too quickly or not well managed they will have adverse cost implications on the supply chain or will not deliver the desired outcomes	Moderate	High	High
Mitigation			Need sufficient time for the industry to adapt	
Mitigation			Implement a comprehensive change management process	
Mitigation			Negotiate changes with incumbent to start process or allow for existing contracts to expire.	
Opportunity			Good scale to allow investment in top quality management systems, high productivity plant, new products and methods.	
Opportunity			Scale to give more efficient utilisation of physical resources	
Opportunity			Gives the opportunity to develop staff through focused mentoring and good career path	

Risk #4	There is a risk that new network areas will be implemented before the Asset Management Group (AMG) is in place and fully functioning	Low	Low	Low
Mitigation		Centralised structure to draw on current expertise from external resources		
Opportunity		Fewer contract areas will enable better governance expertise		

Risk #5	There is a risk that due to the time to implement the outcome there will be variations of standards across contract areas	Low	Low	Low
Mitigation		AMG to develop strong relationships with regional asset managers		
Mitigation		Need to ensure standards are		

			implemented over full extent of contract area
Opportunity			Long term more consistent setting of standards across the country

Risk #6	There is a risk that SME contractors will be eliminated from the market	Low	Low	Low
Mitigation		Minimise barriers to entry and encouraging joint ventures.		
Mitigation		Client has direct involvement with subcontractors		
Mitigation		Consider using tender evaluation criteria to support sub contractor resources – sustainable procurement		
Mitigation			Consider using a supply panel provided value for money can be demonstrated	

Risk #7	There is a risk as network size increases there is a perception of reduced opportunity for full local authority collaborations	Low	Moderate	High
Mitigation		NZTA to work closely with Local Authorities identifying the areas for and degree of collaboration that compliments resources and network synergies		
Opportunity			Increased client capability will be able to provide a higher level of expertise	

Risk #8	There is a risk that clustering will reduce opportunities for smaller contractors	Moderate	Moderate	Low
Mitigation		Minimise barriers to entry and encourage joint ventures.		
Opportunity		Supply market will be more sustainable with realistic expectations of work packages		

Risk #9	There is a risk that larger areas may not be perceived as responsive to local needs	Low	Moderate	Moderate
Mitigation			Need to ensure all the diverse spectrum of customers are engaged	
Opportunity		Develop smarter and more efficient systems to		

		manage customers and their feedback		
Opportunity			Increase the focus on freight and tourists having a seamless journey or other inter-regional customer needs	

Risk #10	There is a risk that smaller contract areas will not have the flexibility to respond to funding changes	High	Moderate	Low
Mitigation		Need to ensure contract documentation has flexibility to incorporate funding change		

Risk #11	There is a risk that larger contract areas could be politically unacceptable (Closed)	Low	Medium	High
Mitigation			Need to tangibly demonstrate the financial benefits of larger contract areas	
Opportunity			Identified savings to NZ incorporated.	

4 Collaborations

4.1 Problem Statement

There are different degrees of collaboration and different examples of existing collaborations from simple memorandums of understanding for specific activities such as management of lighting or traffic signals to clustering as currently implemented in Marlborough Roads.

A more consistent approach to identifying opportunities to collaborate at different levels should be considered but recognising that Local Authorities have a far wider service deliver requirement beyond roading.

To maintain a healthy and competitive market there needs to be a balance between size of contracts and programming of works. Based on the evidence to date, there is a case for reducing the number of maintenance and operations contracts across NZ to optimise resources and deliver financial benefits to road controlling authorities.

4.2 Recommendation

It is recommended that opportunities to collaborate are identified and that the level of collaboration be reviewed to see where the most effective value for money opportunities exists. The NZTA sees three distinct levels of collaboration:

- a) Intellectual Management - Where a number of areas exist that staff from various approved organisations could assist one another in sharing ideas, balancing competing needs, assisting in filling knowledge shortfalls, benchmarking and comparing unit cost

- b) Shared service arrangements – Where two or more approved organisations share the same resources through joint contracts, programme works to be complementing of each authorities needs, or jointly manage activities or networks through a memorandum of understanding.
- c) Clustering – Where two or more approved organisations jointly manage services through an agreed documented arrangement.

5 Performance Incentives

5.1 Problem Statement

There continues to be issues in managing contracts around the variability of supplier performance for both physical works and professional services. In particular, the contracts themselves have varying degrees of risk sharing and incentives on suppliers to perform.

A more consistently applied level of service and contractual incentive regime is likely to benefit the performance the NZTA receives from its suppliers, enhancing the overall value for money received.

5.2 Current Situation

There are currently a range of mechanisms in the NZTA contracts that incentivises supplier performance.

The range of mechanisms is as follows:

- a) At Risk payment and variants: More recently a financial performance system (there are several variants currently operating) has been developed. These systems financially penalise poor performance across a series of predetermined metrics.
- b) Additional Works: There are a range of works traditionally added to contracts that were not able to be fully scoped or accounted for within the original contract brief. There are opportunities for some of these works to be used as a performance incentive.
- c) Contract Extensions: Many of our current contracts allow for extended contract durations and in general are determined based on interim PACE scores. In some cases the hybrid contract utilises a combination of quantitative deliverables and qualitative PACE scores. These contract extensions are nearly always applied where this has been provided for.
- d) Financial KPI's: The alliance contract uses financial KPI's to measure performance in a range of areas.
- e) Pain-Gain Risk Sharing: The pain gain mechanisms within the Alliance contracts are intended to incentivise supplier performance by ensuring they have a stake in the overall performance objectives, aligning them with the objectives of the client.

There are also softer mechanisms in place to manage contracts and relationships, which ultimately encourage performance:

- f) PACE: The evaluation of our supplier's performance on the official performance measurement system. The PACE scores developed is used by suppliers in most cases as proof for Track Record when tendering other contracts. There is concern by suppliers that the system is still too subjective with wide regional variance. Suppliers

do note that it works well for measuring their performance in the contract and support its continued use.

- g) **Management Boards:** Management boards are in place for many of the network contracts. These are largely operating positively, and providing some oversight and benefit in terms of performance.
- h) **Supplier Relationship Meetings:** High level one-on-one management discussions to better understand any concerns or issues of each party.

5.3 *Recommendation*

Most of the above mechanisms remain valid and appropriate approaches to incentivising supplier performance. The incentives identified below need to be considered for both physical works and professional services, consideration also needs to be given to how contract performance links both contractor and consultant performance when utilised in an out sourced situation. For single supplier environments assessment of the consultancy services needs to be also considered. The following four are considered to be key to ensuring good performance is received, with improvements in their application as noted:

- a) **PACE:** Aside from the actual performance scores, this system could be better used to encourage more open and informed discussion between middle management on performance. More consistent application of the PACE system and more regular training on its application is encouraged. This should provide a softer form of performance incentive. As we move to more performance oriented contracts the PACE system and contract performance metrics could work together to achieve better consistency in our approach.
- b) **At risk payment:** We believe the “At risk payment (Bucket System)” has merits. There is some work to consolidate to a single system, and develop guidance on its best use. The system needs to be calibrated correctly to ensure it is fair, and managed appropriately and equally across the country. This will provide a direct financial incentive, in real time, to perform.
- c) **Additional Works:** We believe there are significant opportunities to better utilise the variations let through the maintenance contracts to encourage supplier performance. Traditionally variations have been high margin activities for our suppliers. We believe a system that apportions the amount of variations a supplier gets, based on their performance will act as a huge incentive. For example, where a supplier is not performing, more work where possible will be tendered on the open market. It is acknowledged that we will develop better protocols for delivering additional works including emergency work reinstatements that ensures value for money outcomes.
- d) **Contract Extensions:** Our process for extending contracts needs to be reviewed. This has the potential to be a good performance incentive for suppliers, however it is rarely utilised. There is an opportunity to tap into this mechanism to make it more useful in encouraging performance. This will necessitate a more organised and structured approach to considering contract extensions. It is recommended a central committee (VAC or similar) be given a role to adjudicate on contract extension decisions. In line with the hybrid model which uses an Appraisal Score determined from the network compliance scores should be incorporated with the PACE assessment scores to give an overall measure of performance. NZTA must also become more assertive in the application of the contract extensions to remove poorly performing suppliers.

At the end of each contract extension a rebasing of contract rates could be implemented to manage the impacts of cost fluctuations which become significant towards the end of long term contracts. It is recommended contracts are benchmarked against other contract areas and an open book philosophy is

implemented with a third party auditing accounts to assist in refreshing the contract. The process of rebasing needs to be clearly prescribed.

- e) **Earned Value:** We believe consideration should be given to using this as a method of performance measurement of underpinned quantities. Earned Value is a technique that uses “work in progress” to indicate what will happen to work in the future. Earned Value is an enhancement over traditional progress measures. Traditional methods focus on planned accomplishment (expenditure) and actual costs. Earned Value goes one step further and examines actual accomplishment. This gives the client greater insight into potential risk areas. With a clearer picture, the client can create risk mitigation plans based on actual cost, schedule and technical progress of the work. It is an “early warning” program/project management tool that enables the client to identify and control problems before they become insurmountable.
- f) **External audits of the Clients Performance:** We consider that the success of a contract is directly related to the people. To date all measures have been directed to assess the performance of the supplier with little consideration of the Client’s performance. To this end an external audit by a third party should be undertaken assessing the Clients performance with results submitted to NZTA management for consideration.

6 Contract Tenure

6.1 Problem Statement

There are efficiency gains to be had through greater tenure periods including attracting suppliers possibly not established in the area. The value of these gains will be compromised if no tension is placed on the supplier to perform.

The escalation formula used by NZTA continues to add cost throughout the contract term ultimately resulting in contract costs greater than the market price would have delivered for the same outcome.

6.2 Current Situation

For asset management activities, the current tenure spectrum ranges from 3 to 10 years for the main network contracts, segmented by delivery model as follows:

Delivery Model	Tenure
Traditional	3 – 5 years
Hybrid	5 – 7 years
PSMC	10 years
Alliance	10 years

The different delivery models have different mechanisms for treating the contract term, the:

- PSMC is the only contract which has a fully fixed term period and can only be terminated early due to major non-conformances. Cost fluctuations are paid from the commencement of the contract until the completion date.
- Alliance has a fixed term period but allows for rebasing the contract at designated periods within the fixed term. If agreement cannot be reached on rebasing the contract then the contract can be terminated. Rebasing the contract resets the cost fluctuation provisions.
- The Hybrid and Traditional contracts while having a fixed term are further subdivided into separable portions, usually of a 1 or 2 year period. The award of a separable portion is based on the supplier’s performance it also resets the defects

liability period. Cost fluctuations are paid from the commencement of contract until completion date.

There is limited value to be gained from having a fixed term with a number of short 1 to 2 year extensions as:

- The cost and time to terminate a contract on poor performance often inhibits its implementation,
- There is insufficient time to get a new supplier in place,
- The supplier takes some time to get up to speed to deliver the required level of performance, and
- The supplier will likely price their short term risk exposure into their rates.

6.3 Recommendation

The approach taken to contract tenure is highly related to the outcome of the contract model, and the requirement to incentivise supplier performance.

The outcome of the measurement phase of this analysis indicated that a longer overall tenure, tensioned with renewal requirements as currently utilised for both hybrid and traditional contract, albeit for a longer extension period, would most likely provide more efficient outcomes. The longer duration creates increased certainty for the contractor, therefore encouraging greater competitiveness at tender time.

The recommendation is for 9 year term contracts and, in exceptional circumstances where there is no interest from other suppliers and performance has been good, extending the contract beyond the 9 year term could be considered, but noting that a value for money would need to be demonstrated over the full contract term.

Evidence suggests that it takes 18 - 24 months for a new supplier to achieve a satisfactory level of performance, if a supplier does not achieve suitable performance within a 24 month period consideration needs to be given to terminating the contract and re-tendering. For this reason it is recommended that the initial term of the contract be 3 years.

The renewal requirement is expected to continue to drive the performance tension through the contract period. For this reason, it is considered that more even split of the tenure period, being 3 plus 3 year separable portions would provide greater performance tension.

The NZTA are strongly of the belief that the renegotiation and renewal options need strong leadership, and that to be fully recognised within industry as a true performance incentive it must be earned. In that respect, we must ensure that renewals are only awarded for good performance. By carrying out regular performance assessments, poor performance trends will be identified. Failure to rectify these trends will result in non renewal of the contract.

7 Delivery Model

7.1 Problem Statement

The measurement phase analysis has shown some models provide better value for money and performance outcomes, results are however scattered across all delivery models. The current situation however has enabled the identification of the attributes that make up a good performing contract model.

7.2 Current Situation

There are currently 4 different delivery models utilised around the country. Each delivery model has been modified to fit regional requirements with only the traditional delivery model having a centralised change management process. This has caused concerns to suppliers as the delivery models lack uniformity around the country.

It has also become apparent over time that each of the Traditional, PSMC and Hybrid delivery models has become far more aligned with each other, as lump sum elements, measure and value rates and trade off factors are included in many forms. In addition NZTA regions have managed each of the delivery models in different ways in some cases reverting back to more traditional management approaches.

The following is an overview from the learning's of the review in regards to key delivery model attributes:

- Efficiency and effectiveness can be gained through having a fully integrated, capable and high performing team working more collaboratively with key supply partners, in a centralised fashion. Contracts where the people involved have healthy working relationships and have an increased focus on working collaboratively, perform better irrespective of the delivery model. Such contracts ensure whole of life best for network outcomes.
- Lump sum contracts can be costly to change in some cases but in others have provided tremendous value where change does not occur. They can be manipulated if performance measures are not targeted or realistic. Flexibility for the NZTA creates uncertainty for suppliers. This affects how they approach a contract, and comes at a price. It also affects the benefits and risk transfer we can receive from operating in an outcome focussed environment, Nonetheless, where significant change is likely, a more flexible pricing model is more likely to deliver best value for money. Lump sum contracts also can become contentious when network changes are implemented.
- There are efficiency gains to be had through improved co-ordination of activities and improved ownership of the network by the suppliers where greater emphasis is put on a whole of corridor approach (all activities) to maintenance. Emphasis needs to be placed on doing the works in the right place at the right time through strategic and targeted performance measures, driving optimal treatments. This also results in achieving benefits from larger contracts including sufficient value to attract suppliers possibly not established in the area. Including most if not all boundary to boundary activities will lead to better overall management. Specialist activities could be tendered separately or included in one contract with overlapping contract boundaries.
- There are benefits to be realised from consistent implementation of a rewards performance criteria process, as well as tension to ensure performance and quality outcomes. Reward opportunities include factors such as, contract renewal period, additional work and incentive payments.
- There are efficiency gains to be realised where the supplier has developed a self certification process that is robust, auditable, relevant and aligned. The Client needs to be intimately involved and engaged in the assessment. This also results in more streamlined roles and responsibilities with less duplication of roles but is reliant on a good audit regime.

7.3 International Research

A range of different forms of contract from around the world have been considered as part of this review. The contract forms others have adopted in many cases appear to have been adopted to suit the specific needs of the respective operating environments. Many countries have tried various approaches, and then made significant changes in the next series of contracts let when things have not appeared to have been optimal.

Whilst in most cases the models used are not considered to be directly transferable to the New Zealand context and/or superior to the models we operate current, there are some specific approaches that are common to many of these models that are of direct interest to us in designing a new delivery model:

- Outcome based performance measures have become common practice.
- The need to work closely with suppliers in a collaborative fashion has been recognised as important
- Incentivising supplier performance has been attempted in numerous ways, with the general idea only good performing suppliers should be rewarded with good levels of profit.
- Performance contracts need clearly defined and measurable outcomes directly traceable to users needs and aligned with broader strategic objectives
- The need to formalise partnership approaches through a network board. The benefits of which are, reduced litigation, successful profitable contracts, and improved morale.
- As customers become more important in judging the performance of the suppliers, and of the road infrastructure, they need to be more informed about what their preferences mean and how they may translate in conflicting values or choices for the operators of the network.
- There needs to be a clear and demonstrable transfer of risk.
- Surveillance of the contractor's compliance should be implemented by an independent group.
- Good and reliable road data is required for tendering and strategic work.

One of the strengths of the NZTA's approach, which could also be considered one of its weaknesses, is that we have in operation four different delivery models. This has allowed for the specific circumstances of each network, and the people managing it, to be recognised in the decision on which delivery model to apply. Notwithstanding this, the general consensus is that maintaining the full suite of four delivery models is too onerous, and that there would be benefit in consolidating our learning's from these models into a smaller set of options.

7.4 Options

The Traditional model currently implemented around the country, with separate design and construction inputs, is not being promoted for future use on main State Highway network contracts at this stage. It is expected however that for specialist works, such as bridge management or works excluded from the main network contracts for performance reasons, a traditional contract may continue to be the best approach. The NZTA is aware that for Alliance contracts and some local authority contracts there is a heavy reliance on using the developed standardised traditional specification (SOMAC). To this end regardless, the NZTA may elect to continue to maintain some guardianship over this contract form.

Whichever delivery model option(s) are taken forward the model, to be developed through the implementation phase of this project, must consider as a minimum the following:

- Flexibility to deal with change both in terms of both Level of Service and funding,
- Focus on targeting the right treatments at the right place,
- Focus on assessing healthy working relationships,
- Maintain some form of commercial tension,
- Include a whole of corridor approach,
- Allow for both self certification with Client controlled checks,
- Consider the input of sub-contractors and the level of involvement NZTA should have in sub-contractor arrangements going forward,
- Maintain a well balanced risk profile,
- Ensure good levels of governance,
- Allow for varying levels of services,

- Provide a centralised management process to control the update and implementation of delivery model enhancements,
- Require good Quality Assurance,
- Have clear defect liability requirements,
- Contain contract drivers that are well aligned with the client's objectives.

Two different delivery model options are promoted as follows. It is anticipated that we would maintain all 3 options, deploying each in the different circumstances around the country.

Delivery Model 1 - Value Service Delivery Model (One Contract)

We now have considerable experience in setting up and managing performance based contracts through the existing PSMC and Hybrid contract approaches. However we believe there still exists plenty of opportunity to improve on both of these contract models. However both are considered to contain good aspects that we should look to retain. The continued refinement of these two existing contract models into one performance contract model is recommended. The existing Hybrid contract model is likely to be the best starting point. It is recommended that we continue to build on this current regime, and taking into account and implementing the desirable attributes identified throughout the Maintenance and Operations review. Some of the notable attributes of the new contract model are:

- It will be based on the NZS: 3910 form of contract with an independent engineer to the contract.
- It will contain a mix of both output and outcome based requirements.
- Clearly define the risk profile within the contract and look to transfer risk to suppliers through Lump Sum payment items and where the scope of the works cannot be clearly defined a more transparent cost approach could be adopted.
- There will be cost fluctuation mechanisms.
- There will be day works mechanisms for valuing works which cannot be adequately scoped, such as winter maintenance and emergency response beyond an agreed risk profile,
- Other works such as emergency reinstatement or additional works may be tendered out
- Flexibility to adjust quantities and levels of service through the contract.
- Clearly defined and measurable outcomes and value for money performance measures.
- Formalised partnerships through Contract Management Boards
- Quality supervision of construction
- Mechanisms to reward and penalise performance

There are a number of consistency issues with the current approach. Going forward we recognise the need to standardise these contract models, limiting variance to only areas where there are truly different network demands.

This report discusses the potential for 3 model options for the State Highway Network as described below:

Delivery Model 1a - Value Service Delivery Model (Single Supplier)

The first of these utilises a single supplier, who is directly engaged by NZTA, as is the current approach on the PSMC contracts. Consultancy services or Contractor services are arranged by the NZTA engaged supplier as required, and supervision is provided by an independent organisation or NZTA

The benefits of this approach are:

- Simplified management relationships,
- Less overall reliance on independent consulting inputs.

- Allows for greater levels of ownership by NZTA staff,
- Consultant input subject to greater commercial tension,
- Allows for greater collaboration between Client and Contractor,
- Better use of Asset management resources NZ wide,
- Reduces process churn,
- Potential opportunities for greater innovation through collaboration,
- Provides growth opportunity for NZTA asset managers

Some of the dis-benefits of this approach are:

- Puts high degree of trust in one party to deliver,
- Impacts on the consultancy industry and how it currently operates,
- Loss of protection in having an independent party undertaking surveillance,
- Possibly higher client resource requirement

Delivery Model 1b - Value Service Delivery Model (Two contracts)

In addition to the above, we are promoting a second option that is effectively a variant on option 1a as described above. It is envisaged that it would be equivalent in most respects to option 1a, but with the key difference being that the Client engages the consultant directly (very similar to the current arrangements under a Hybrid contract).

This would allow more direct control by the Client and input into the contract surveillance and quality assurance. The detail of exactly what services would remain with the Contractor and what would be completed by the Consultant / Client will need further detailed consideration. It is noted this does add complexity to the model, given we are aiming for a performance based approach with our Contractors, but it does more closely align with the general Hybrid approach which the data suggests to be the most successful of the delivery models used by the NZTA to date.

Delivery Model 2 - Alliance

The use and ongoing refinement of this delivery model should continue. It is currently aligned for use on highly demanding and complex networks. To this end, it is only the Auckland and Wellington networks where the potential for an Alliance is thought to exist at this point in time. However it is noted that other maintenance alliances exist with several TLA's around the country, and these are on much smaller or less demanding networks. We will continue to watch with interest how these contracts perform, and consider whether there is increased scope for the Alliance model.

Sub component to either agreed delivery models (Evergreen)

It is noted that in some circumstances on our network, very low levels of competition exist. This is due to a number of specific circumstances such as the remoteness of the network, the limitations of the market in some areas, and the highly specialised nature of the works. The Milford network is an example of a network where all of these characteristics exist.

Under these circumstances reliance on an approach to contracting that looks for competition to tension contract prices is not ideal.

It is therefore proposed, noting that it is envisaged this will most likely only be considered on a very small number of networks, that evergreen contracts be used. Such contracts may have the potential to be extended for periods of up to 50 years where good performance continues to be obtained.

It is likely they would be established using a form of contract similar to that of an alliance, and they would contain well designed performance measures to ensure good results are achieved. These measures would be linked to contract extension decisions such that a clear

and auditable trail of evidence can be maintained over the life of the contract demonstrating value for money and continued improvement.

It is recommended that the details of the design of the contract models are determined as part of the implementation phase to ensure that we capture the outcomes of the entire problem areas covered in this report.

8 Benchmarking Contracts

We recognise that going forward the relative performance and associated value for money we receive across the State Highway network could be better benchmarked on all our contracts.

With the consolidated approach to delivery models and network areas, and the increased internal asset management capability, we expect there will be considerable improved opportunities to create and collect performance on a range of metrics that will better facilitate this benchmarking.

This will be an important part in testing the effectiveness of the Maintenance and Operations review, as well as informing future enhancements to the operating procurement regime.

The details of our approach to benchmarking performance are yet to be developed, and are best designed once the new procurement regime is fully developed. However at a high level we would expect to be able to benchmark:

- Overall relative value for money between both networks and suppliers.
- Predictability of costs.
- Quality of delivery, including for example better information on achieved pavement and surfacing life.
- Value for money achieved on additional works.
- Levels of customer service and satisfaction.
- Optimising expenditure through smart asset management.

An opportunity could exist for benchmarking on a regional basis between NZTA and neighbouring Local Authorities. This concept is currently being considered through a project developed in conjunction with Construction Excellence.

9 References

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