



macro perspective  micro analysis

Ministerial Road Maintenance Task Force

Research Support for Collaboration and Clustering

Prepared for:

NZTA

And

Technical Working Group Research Team – Collaboration and Clustering

Quality Assurance Statement

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1 Background and Introduction

A road maintenance task force was established in late 2011 to understand opportunities for increasing the efficiency, effectiveness and whole of life value for money in delivery of road maintenance. Five research topic teams were established to better understand a number opportunities. One of these opportunities was to optimise the scale of the networks and delivery of services by better understanding opportunities for **collaboration and clustering amongst road controlling authorities**.

The Road Maintenance Task Force Objectives are:

In order to achieve our purpose the Task Force has identified seven objectives which we will report back on:

- 1) *understand the cost drivers of maintenance and renewal activity and their relative importance*
- 2) *identify opportunities to improve both efficiency and effectiveness in the planning and delivery of operations, maintenance and renewals, that achieve least whole-of-life cost for the network and enhance community well-being*
- 3) *identify innovative services, products and methods of procurement to achieve value for money and a safe network*
- 4) *identify examples of best practice standards and guidelines, including standardised and harmonised contract documentation, that could be implemented*
- 5) *better understand the cost implications of risk transfer associated with planning and delivery of operations, maintenance and renewals and identify examples of good practice in risk identification, management and allocation to deliver better value for money across the Industry*
- 6) *promulgate the uptake of the Task Force findings*
- 7) *consider the benefits of continuing the Task Force approach, with the aim of fostering best practice and collaboration in the sector.*

*Jim Harland
 Convenor
 Road Maintenance Task Force*

The research support has provided input to objectives 1) to 5).

Rationale Ltd was commissioned to provide research support, data and analysis to the team. The analysis was used by the team to formulate recommendations. Rationale have not provided any recommendations as part of this scope, but have provided analysis that has been used by others to make recommendations. The research team have also used other data sources, experience and analysis in making recommendations, so as such this report should not be viewed as the recommendations of the task group.

The purpose of the this report is to document the analysis that Rationale Ltd completed, should it be required for future work.

2 Method

The following techniques and information sources have used to develop the research information:

- Using the skills and knowledge of the research group.
- Using the results of other research providers assigned to supporting the Task Force.
- Analysis of road controlling authorities that have implemented or considered implementing some form of collaboration, clustering or both.
- Analysis of collaboration and clustering examples to identify the source and size of savings identified and to present these in a common theme.
- Sourcing and circulating to the team background reports including experience from Western Australia, reports on the success of existing collaboration efforts in New Zealand and other relevant documents that identify success factors and barriers.
- Sourcing and presenting road maintenance expenditure by road controlling authority across New Zealand, to assist in determining the 'size of the prize' and areas for opportunity.
- Identification of options on the scale and size of clustering and associated benefits and barriers.
- Using the skills and relevant knowledge of Rationale Ltd.

3 Results

The key analysis outcomes and results are documented in the Appendices. These are briefly described below.

The appendices are in the order that they were developed and delivered.

[Appendix A - Spectrum of Opportunity](#)

- Describes the contents of different collaboration and clustering models from the traditional network model to full integration.

[Appendix B - Collaboration Template Datasheets](#)

- Analysis of different collaboration and clustering models that have been implement or considered where information is available.
- Provides a consistent template.
- Provides a means for comparing different models.

[Appendix C - SWOT Analysis](#)

- SWOT Analysis completed against the distinct network delivery components. Limited traction on this component.

[Appendix D - Research Group Agreed Goals and Objectives: Success Factors](#)

- The Research Groups goals and objectives for undertaking collaboration and clustering.

- These have been aligned to the PWC report. (Evaluation a New Approach to Maintenance and Operations Procurement – 1st Draft, PWC, January 2012.)

[Appendix E - Benefits vs. Network Size](#)

- Compares network size (clustering) achieved benefits of the core objectives and network delivery components. These are qualitative only.
- Details are provided on the basis of the assessment.

[Appendix F - Ten Network Clustering Analysis](#)

- Attempts to define ten clustered networks for New Zealand.
- The clustering has been completed with context to the following variables:
 - Length, VKT and Total Cost
 - Economic Benefits
 - Cultural and Social Benefits
 - Environmental
- These are yet to be properly documented.
- No analysis of savings completed.

4 References

Evaluation a New Approach to Maintenance and Operations Procurement – 1st Draft, PWC, January 2012.

Review of Delivery Models for Works and Services – Draft, Opus, January 2012.

NZTA Network Statistics for the year ended 30th June 2009

Performance Based Contracting for Roads in Australia. Performance Based Contracts Resource Guide. Case Study Australia/ World Bank.

Transit New Zealand. Agenda Item ST7-0019. Marlborough Roads

Transit New Zealand. Agenda Item PR6-5001. Marlborough Roads Contract Extension

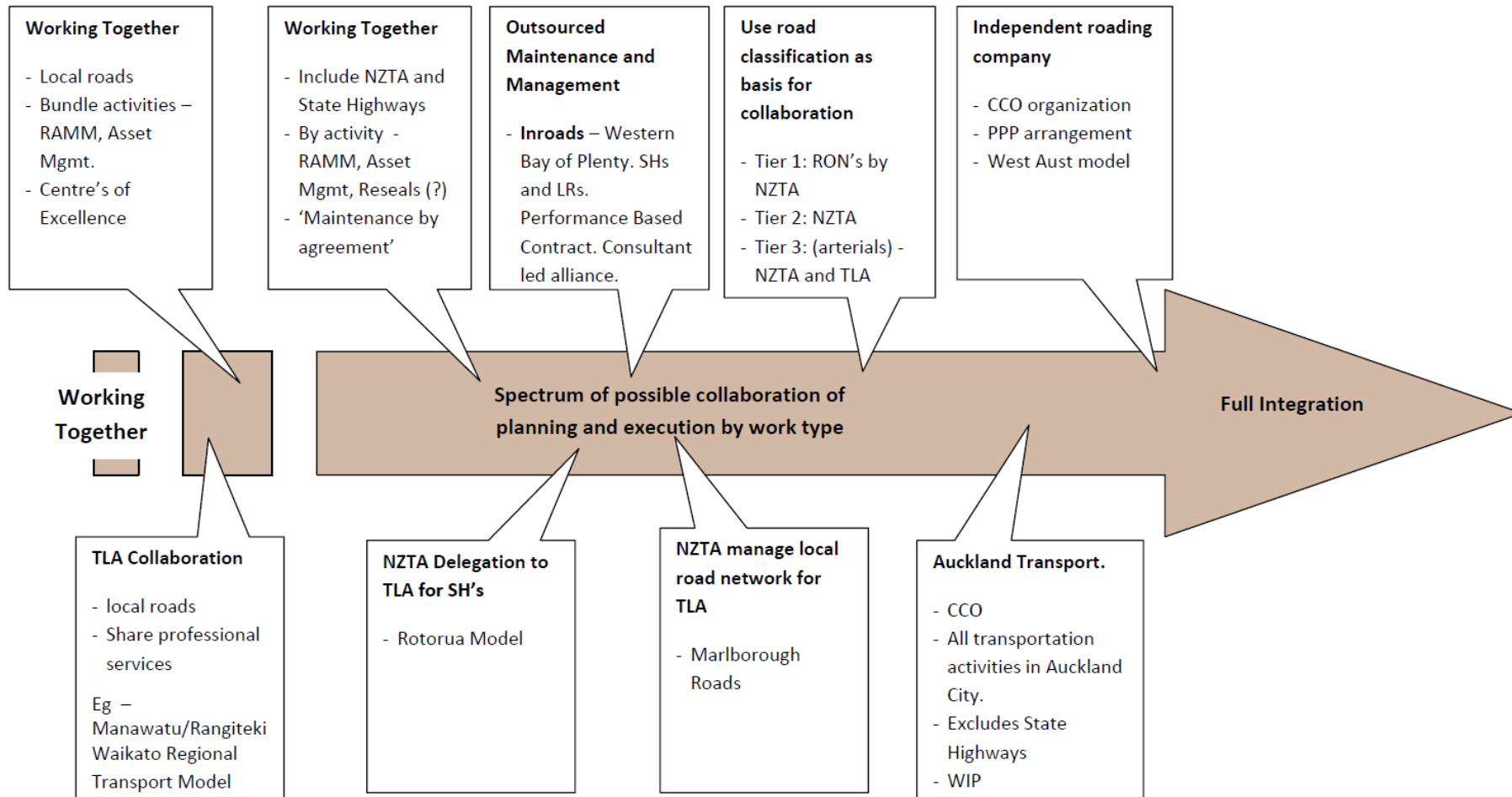
InRoads, PBC-01 Five Year Review. Bay of Plenty

J W B Noble & R Barnsley, Long Term Road Maintenance Contracts in Western Australia, Where to after Term Network Contracts. Transportation and the Pursuit of Excellence NZHIT & Transit NZ 8th Annual Conference 2006

Appendix A - Spectrum of Opportunity

Models for Consideration

- Cluster/collaborate by geography. Potentially independent of decisions on clustering/collaborating by work scope.
- Continuum/spectrum of work type collaboration and associated management structures (see below).
- In all cases consider a type of best practice advisory group for State Highways and local roads. Possibly sub-regional.



Appendix B - Collaboration Template Datasheets

Roading Maintenance Model Datasheet

Name

Description

Status

Years Established

Assets

Local Sealed Roads	855	km
Local Unsealed Roads	680	km
State Highway	78	km
Tier 1 And Tier 2	0	km
Total	1613	km

Establishment Cost Salaries for independent body and office set-up

Managing Entity

Contract Type ??

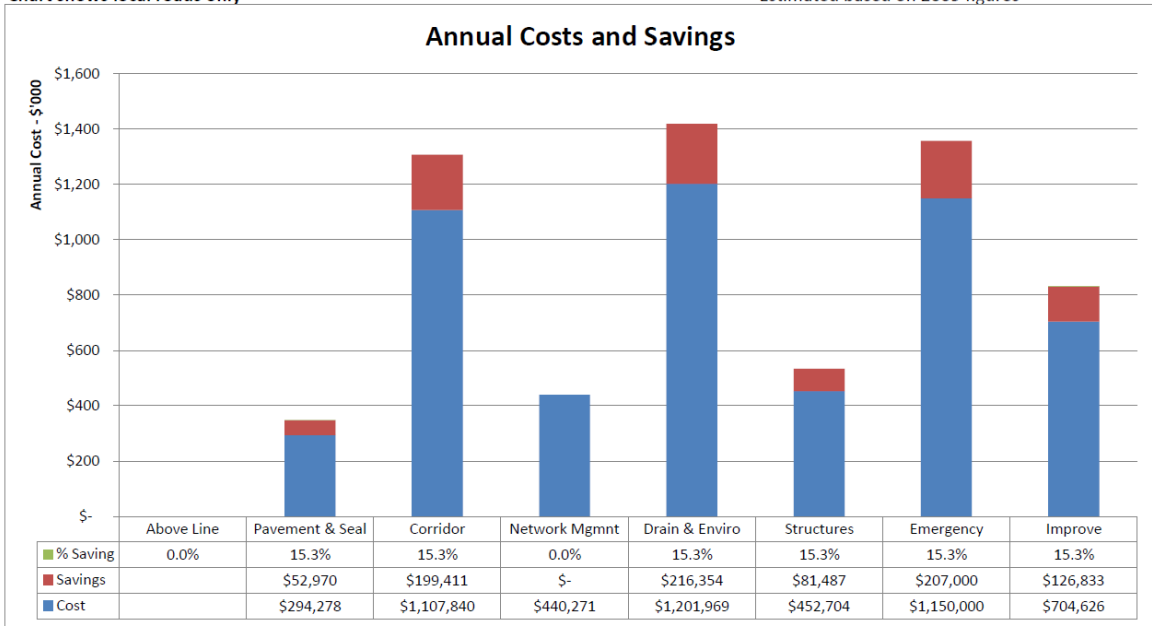
Key Indicators

Human Resource to Physical Works Ratio	
Consultant to Physical Work Ratio	
Maintenance Cost/km	\$ 2,691

Characterise Level of Integration

Geographic	2
Execution	2

Costs and Saving Total Cost ('000's pa) 2001 \$\$ Savings
 Chart shows local roads only Estimated based on 2009 figures

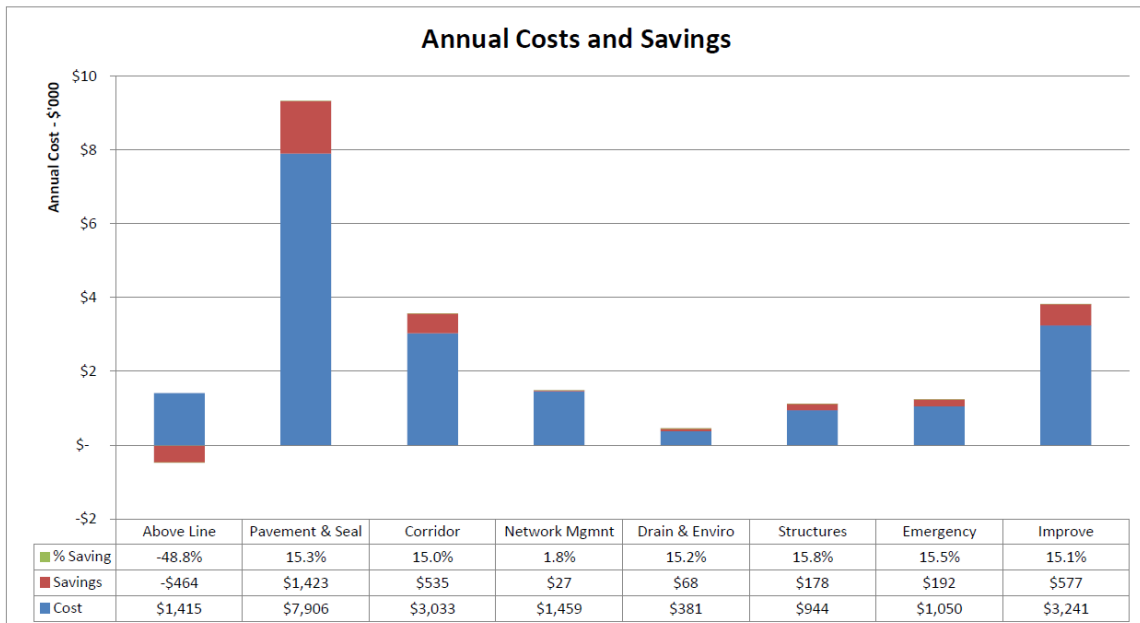


Comments

In place since late 2000. Agreement extended in 2005.
 Discrete office for operating entity with NZTA staff
 Consolidated to one contractor.
 TLA service levels communicated via Local Roads Asset Management Plan
 Robust model - significant growth pressure in area over life of agreement

Roading Maintenance Model Datasheet

Name	Remarkables Roads											
Description	Integrated roading company to manage state highways and local roads across Queenstown Lakes and Central Otago Districts											
Status	Studied											
Years Established	n/a											
Assets	<table border="1"> <tr> <td>Local Sealed Roads</td> <td>776 km</td> </tr> <tr> <td>Local Unsealed Roads</td> <td>1784 km</td> </tr> <tr> <td>State Highway</td> <td>540 km</td> </tr> <tr> <td>Tier 1 And Tier 2</td> <td>0 km</td> </tr> <tr> <td>Total</td> <td>3100 km</td> </tr> </table>		Local Sealed Roads	776 km	Local Unsealed Roads	1784 km	State Highway	540 km	Tier 1 And Tier 2	0 km	Total	3100 km
Local Sealed Roads	776 km											
Local Unsealed Roads	1784 km											
State Highway	540 km											
Tier 1 And Tier 2	0 km											
Total	3100 km											
Establishment Cost	\$700,000	Salaries for independent body and office set-up										
Managing Entity	Independent Board											
Contract Type	Performance Based											
Key Indicators	<table border="1"> <tr> <td>Human Resource to Physical Works Ratio</td> <td>9%</td> </tr> <tr> <td>Consultant to Physical Work Ratio</td> <td>2%</td> </tr> <tr> <td>Maintenance Cost/km</td> <td>\$ 6,899</td> </tr> </table>		Human Resource to Physical Works Ratio	9%	Consultant to Physical Work Ratio	2%	Maintenance Cost/km	\$ 6,899				
Human Resource to Physical Works Ratio	9%											
Consultant to Physical Work Ratio	2%											
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Characterise Level of Integration	<table border="1"> <tr> <td>Geographic</td> <td>3</td> </tr> <tr> <td>Execution</td> <td>4</td> </tr> </table>		Geographic	3	Execution	4						
Geographic	3											
Execution	4											
Costs and Saving	Total Cost ('000's pa) \$ 19,429	Savings 11.5%										



Comments

Proposal was terminated prior to implementation.
 Management was via an independently appointed board and a separate organisation
 Project plan was for a transition from initial hybrid contract scope where capital works and specialised project services were tendered outside of main contract through to full implementation of a performance based contract for all work.
 Additional costs for asset management and auditing as well as overhead associated with Remarkables Roading organisation.

Roading Maintenance Model Datasheet

Name

Description

Status

Years Established

Assets

Local Sealed Roads	790	km
Local Unsealed Roads	250	km
State Highway	122	km
Tier 1 And Tier 2	0	km
Total	1162	km

Establishment Cost Salaries for independent body and office set-up

Managing Entity

Contract Type

Key Indicators

Human Resource to Physical Works Ratio	
Consultant to Physical Work Ratio	
Maintenance Cost/km	\$ 11,895

includes improvements

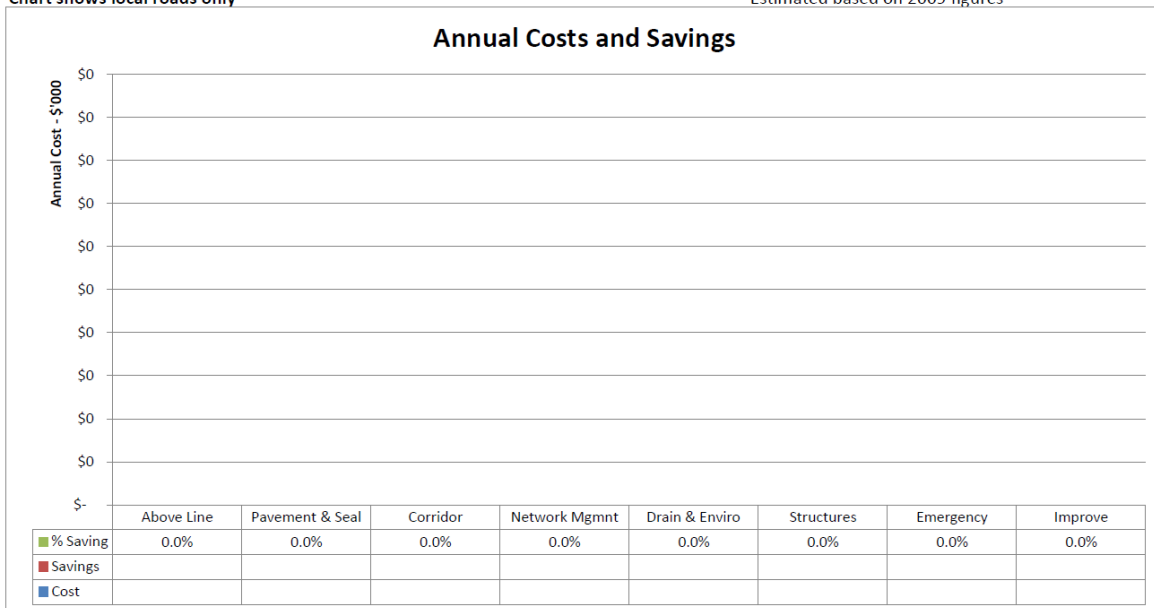
Characterise Level of Integration

Geographic	2
Execution	5

Costs and Saving Total Cost ('000's pa) 2001 \$\$ Savings

Chart shows local roads only

Estimated based on 2009 figures



Comments

Cost breakdown unavailable. Contract scope and costs include some capital works

Summary of Collaboration Models

- Collaboration/clustering can occur at two main levels: geographical and in execution of work scope
- Assess the level of integration for each model using a scale 1 through 5
- Data used to correlate the % savings with the level of clustering and collaboration

To be populated from datasheets

Project	Geographic	Execution	% Saved	
Remarkables Roads	3.5	4	12%	placeholder data
WA Model	5	5	25%	placeholder data
Bay Roads	2	5	21%	placeholder data
Rotorua				placeholder data
Marlborough Roads	2	2	14%	placeholder data
Manawatu/Rangitiki				placeholder data

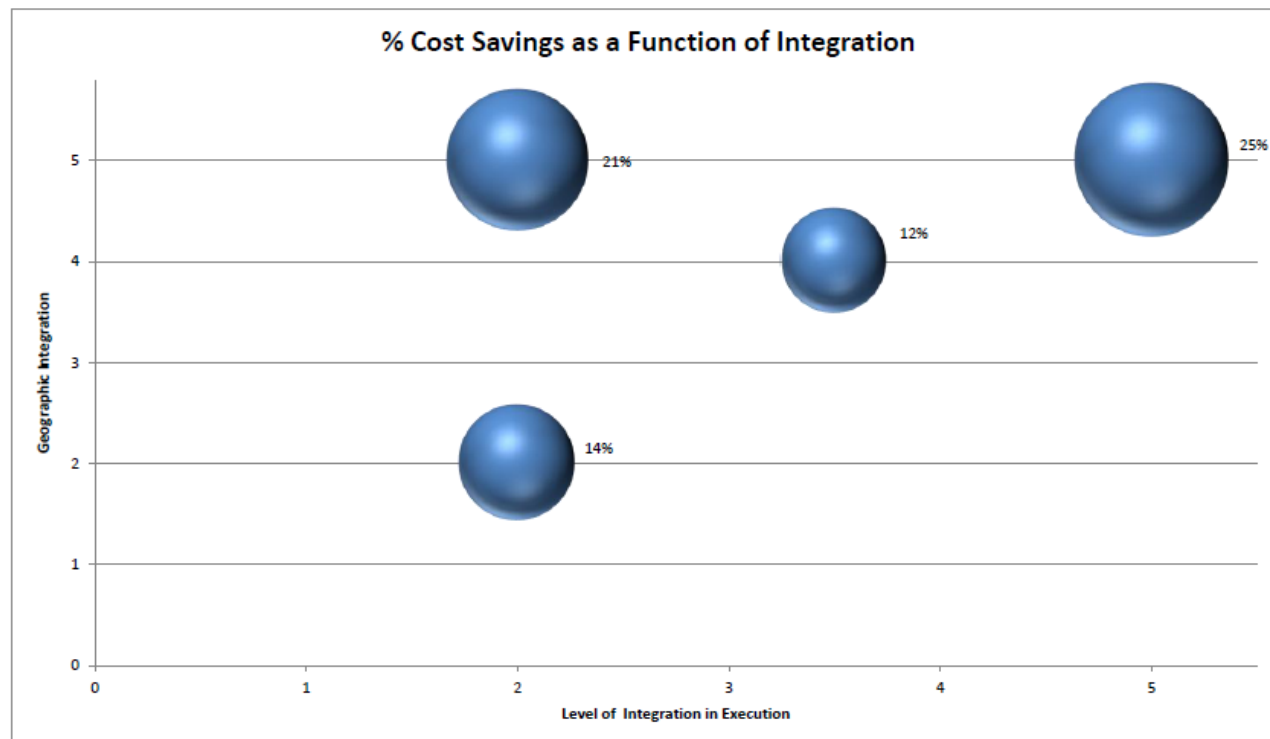
The size of the bubble represents the size of the cost savings

Guide to Assessing Level of Geographic Integration

Level	Features
1	Collaboration between 2-3 neighbouring district councils
2	Collaboration between a district council and NZTA for State Highways
3	Collaboration between 2-3 neighbouring district councils and NZTA. Total asset km threshold??
4	Collaboration between TLA and NZTA on a regional basis
5	Collaboration between TLA and NZTA across more than one region

Guide to Assessing Level of Integration in Execution

Level	Features
1	Cooperation across limited areas (eg - professional services)
2	Maintenance by agreement, packages of work such as reseals, typically conventional contract
3	Maintenance of network delegated to one entity - TLA or NZTA, hybrid contracts
4	Maintenance of network delegated to single entity, performance or output based contract
5	Full integration, delegated to separate management entity, often alliance based contract



Commentary

25% Maintenance Cost Savings for Main Roads WA

1. The 25% figure is indicative / illustrative only.
2. Evidence below suggests different things and needs to be interpreted carefully.

PART 1: EVIDENCE

From the experience of earlier contracts, both within Main Roads and in reports from other road authorities, the Term Network Contracts were expected to realise road maintenance cost reductions of between 15% and 35% for over the term of the contract.

During the award process for the TNCs, the tender prices were compared against two financial comparisons;

- ◆ Bench Mark Estimates that were developed using the contractual obligations and earlier MRWA productivity and costing information; and
- ◆ The previous expenditures that had been incurred by MRWA in the delivery of road maintenance.

Both of these comparisons indicated significant saving could be anticipated from the introduction of these contracts. These indicative savings were in line or exceeded the then indicative savings that would be made from the implementation of the TNCs. However, it was accepted, that until the contracts are complete, it will not be possible to have factual information of the savings obtained but with five to seven years of the TNCs elapsed, the view is that there has been and will continue to be, significant saving from these contracts.

Source: *Long Term Road Maintenance Contracts in Western Australia Where to after Term Network Contracts- J W B Noble & R Barnsley Main Roads Western Australia (2006)*

*Transportation and the Pursuit of Excellence
NZHIT & Transit NZ 8th Annual Conference 2006
Long Term Road Maintenance Contracts in Western Australia
Where to after Term Network Contracts J W B Noble & R Barnsley*

PART 2: EVIDENCE – Report from the Office of the Auditor General

Full Report Available from:

www.audit.wa.gov.au

(See Below)



**Office of the Auditor General
Western Australia**

MAINTAINING THE STATE ROAD NETWORK

Report 6 – June 2009

Background

Roads need regular maintenance to keep them safe, accessible and serviceable. There are two main types of road maintenance; reactive repairs, such as fixing potholes and cracks, done on a day-to-day basis, and planned maintenance, which has long-term benefits and involves the resurfacing and rebuilding of the roads.

Main Roads Western Australia is responsible for maintaining the freeways, highways, main roads and bridges on the state road network. This network provides the major transport links between and within the regional and metropolitan areas of WA. It is approximately 17 800 km in length and valued at \$35 billion.

Between 1999 and 2002, Main Roads contracted out its road maintenance function through eight contracts, each lasting 10 years. The contracts aimed to achieve cost savings whilst maintaining the condition of the roads to agreed levels.

We examined Main Roads’ maintenance of the roads with a focus on the condition of the state road network, the delivery of maintenance on the network, and the link between maintenance and safety related issues.

Examination conclusion...

The condition of the state road network has deteriorated since Main Roads contracted out its road maintenance. Although the road surface is generally smooth, the average age of the road network is steadily increasing with nearly one third of the network having now reached the end of its design life.

The road maintenance contracts have not delivered adequate levels of planned maintenance and contract costs have increased. Addressing the overdue planned maintenance will be expensive and effectively targeting any restoration will be difficult for Main Roads due to a lack of some key information about the condition of the road network. Such information is essential for deciding where, when and what type of maintenance is needed to ensure optimal cost effectiveness. Main Roads has learnt a number of lessons from the existing approach and will need to apply these to new maintenance contracts.

What the examination found...

- *Roads are at increased risk of structural failure because levels of planned maintenance have declined over the past 10 years – resurfacing by 30 per cent and rebuilding by 80 per cent. Delaying planned maintenance will have long-term cost implications.*
- *Planned maintenance has declined, mainly because the road maintenance contracts did not adequately specify road condition measures that would deliver the necessary planned maintenance.*
- *The estimated cost of eliminating existing overdue maintenance may exceed \$800 million.*
- *Contract prices have increased. Expenditure under the 10 year contracts is likely to be \$467 million (59 per cent) greater than estimated in 1999. The major reason for this was the increase in global oil prices.*
- *Weaknesses in the contracts have meant that Main Roads could not adequately ensure the contractors met all agreed outcomes.*
- *Responsibility for any deterioration in the road network was not effectively transferred to the contractors; there is a risk the state will bear the cost to restore the network to its previous condition.*
- *Main Roads lacks some key information about the condition of roads to accurately determine when, where and what type of maintenance needs to be done to ensure the cost effectiveness of future work.*
- *Lessons from current contracting arrangements are being used to inform Main Roads' development of new maintenance contracts.*

What the examination recommended...

Main Roads WA should:

- **ensure effective management of its road asset through the identification, prioritisation and planning of maintenance work**
- **accurately determine levels of overdue resurfacing and rebuilding maintenance, including a review of bridge maintenance estimates**
- **improve and validate predictive modelling for future planned maintenance needs**
- **fully cost the value of actual levels of overdue maintenance, and construct a plan on how the work will be done**
- **determine when to do planned maintenance to minimise costs over the life of the road network (the 'tipping point')**
- **improve and update technical knowledge and skills to enable better road management**
- **improve maintenance management systems and integrate them with contractors systems**
- **apply lessons learned when developing and managing the new contracts**
- **develop and implement a comprehensive strategy to improve skid resistance across the network**
- **standardise monitoring and evaluation of road maintenance work identified during fatal road crash investigations.**

3. Comments

The contract methodology

Appendix C - SWOT Analysis

Collaboration and Clustering – SWOT Analysis: Typical or Generic Business Model.

	Admin/Governance	Policy/Strategy	Resource Management	Asset Management	Network Management	Physical Works
S trengths	<ul style="list-style-type: none"> Well resourced. Reasonably stable RCA structure. Skilled and knowledgeable workforce. Resource Contestability. Established local engagement practices. 	<ul style="list-style-type: none"> Well resourced. Broad and in depth national policy/strategy framework. Well maintained. Availability and Accessibility. Consistent RCA delivery to national policies. 	<ul style="list-style-type: none"> Generally robust transport and corridor planning. 	<ul style="list-style-type: none"> National capabilities are maturing. Training literature. AM tools are improving network knowledge and decision making. 	<ul style="list-style-type: none"> Flexible delivery methods. In-house vs. outsourced. Established local engagement practices. Good contract management. Skilled and knowledgeable workforce. 	<ul style="list-style-type: none"> Contractor efficiency. Consistent network delivery. Standard
W eakness	<ul style="list-style-type: none"> Aging workforce Lack of succession planning RCA function duplication. Resource Contestability Knowledge regarding efficiency and productivity. 	<ul style="list-style-type: none"> RCA duplication of non-national policy/strategy. Continuous evolution of national policy creates inefficiency and frustration at RCA level. 	<ul style="list-style-type: none"> Significant duplication within local authority district plans. Planning uncertainty. 	<ul style="list-style-type: none"> Significant duplication throughout NZ. Inconsistent inputs/outputs. RCA Comparability. Retaining skilled people. Uncertain resource contestability. 	<ul style="list-style-type: none"> Network ownership under outsourced model. AO Duplication Duplication between in-house and outsourced tasks. 	<ul style="list-style-type: none"> Declining competition. Too many contracts. Knowledge regarding efficiency and productivity.
O ppportunity	<ul style="list-style-type: none"> RCA collaboration, clustering and centralisation. Enticing new blood. Assessing efficiency and productivity of current structures. 	<ul style="list-style-type: none"> Identifying policy/strategy standardisation opportunities. Further national standardisation where possible. 	<ul style="list-style-type: none"> Standardisation of district plans. Improved growth management 	<ul style="list-style-type: none"> Creating RCA consistency. Collaboration and clustering. Refining programme contestability. Refining RCA comparability. 	<ul style="list-style-type: none"> Improved utilities management within transport corridor. Scale – Innovation, skills, knowledge, HR. Duplication reduction. Improved programming and coordination. 	<ul style="list-style-type: none"> Assessing efficiency and productivity of current contracting arrangement.
T hreats	<ul style="list-style-type: none"> Retaining skilled people. Declining organisational skills. 	<ul style="list-style-type: none"> Declining efficiency and productivity by modifying/evolving existing national policies. 	<ul style="list-style-type: none"> Declining productivity, certainty and investment. 	<ul style="list-style-type: none"> Retaining skilled people. A slowing of skills improvement. 	<ul style="list-style-type: none"> Productivity 	<ul style="list-style-type: none"> Declining competition. Sustainability. Declining financial resources.

Appendix D - Research Group Agreed Goals and Objectives: Success Factors

Collaboration and Clustering: Goals and Objectives – Success Factors

The following were identified as the core goals and objectives to be achieved by any collaboration or clustering initiatives. The primary headings are those used in the PWC report on Healthy Markets. The goals and objectives are those derived by the Collaboration and Clustering research group.

1. Public and Political Acceptability

- Improved Asset Management and Asset Outcomes
- Integrated Contracting
- Improved Consultation
- Improved Network Integration – Seamless Networks
- Human Resource Sustainability – Retention, Succession, Attraction
- Maintaining and Engaging Communities (especially isolated communities).
- Awareness and improvement of the needs of the Tangata Whenua.
- Supporting Local Economies and Employment.
- Improved Environmental Outcomes.
- Improved Network Optimisation
- Maintaining Flexibility – Reactive to Bundling and Unbundling Opportunities
- Retaining local authority viability

2. Transparency – Sufficient clarity e.g. “anyone can pick the winner”.

- Improved Consultation.
- Improved Network Integration – Seamless Networks.
- Maintaining and Engaging Communities (especially isolated communities).
- Awareness and improvement of the needs of the Tangata Whenua.
- Consistent Processes.
- Nationally Consistent Policies and Strategies.
- Consistent Decision Making.
- Streamlined Procurement.
- Level of Service Alignment.

3. Private Sustainability

- Human Resource Sustainability – Retention, Succession, Attraction
- Supporting Local Economies and Employment
- Improved Engagement with Suppliers
- Shared knowledge and Innovation.
- Streamlined Procurement.

4. Financial Efficiency – The way the prices reflect all available information.

- Increased Price Sensitivity

5. Economic Efficiency – Price competition is present, limited waste and an optimised allocation of resources

- Maintaining Contracting and Professional Services Competition
- Streamlined Procurement.
- Waste Reduction – Operations and maintenance sustainability.

Appendix E - Benefits vs. Network Size

Collaboration and Clustering: Benefits vs. Size

The following graph has been prepared to illustrate in principle what benefit/disbenefit network size may have on a number of attributes.

Network size is defined from the administrative perspective, namely the size of roading network being managed by an Approved Organisation (AO). The graph has been drawn to assume that network size managed by an AO, will have a direct correlation to contract size/value and duration.

The attributes are divided into two groups. These are 1) the principles of a healthy procurement market and 2) the core elements of a network. These are described below.

1. Principles of a Healthy Procurement Market (Uses PWC report)

1. **Fiscal Efficiency** – *Return to Government.* Government gets a good deal. Maximising economic benefit. Minimising administration, evaluation and transaction costs.

The objective/benefit is to maximise Fiscal Efficiency.

2. **Economic Efficiency** – *Return to New Zealand.* Price competition is present, limited waste and an optimised allocation of resources.

The objective/benefit is to maximise Economic Efficiency.

3. **Private Sustainability** – *Return to the Contractor.* Minimise cost and uncertainty for private businesses. Factors to consider are Tendering Costs, Contract Lengths, Maintaining Skills and Investing in Innovation.

The objective/benefit is to support sustainable roading businesses.

4. **Public and Political Acceptability** – Consider both central and local government politics.

The objective/benefit is to award contracts in a way that is publically and politically acceptable.

5. **Transparency** – *Predictability of Process.* Sufficient clarity e.g. “anyone can pick the winner”.

The objective/benefit is to optimise Transparency.

2. Core Elements of a Network

1. **Admin/ Governance, Policy/Strategy** – The functions of an AO.

The objective is to optimise the resource inputs into the functions of an AO without compromising the service delivery.

2. **Asset Management** – Asset registers, asset attributes, lifecycle planning, levels of service, risk, performance measurement, network planning etc.

The objective/benefit is to ensure nationally consistent asset management enabling priorities and performance to be measured consistently and transparently between AO's.

3. **Network Management** – General management and control of the road network and management of road assets – See Work Category 151 of the Planning, Programme and Funding Manual. Services can be delivered in-house or via a professional services contract.

The objective/benefit is to optimise the resource inputs into this function and to ensure nationally consistent outcomes that are fit for purpose, deliver innovation and a skilled workforce.

4. **Physical Works** – Maintenance, renewal and operating the roading network.

The objective/benefit is to optimise the resource inputs into this function and to ensure nationally consistent outcomes that are fit for purpose. Other characteristics include the delivery of innovation, improving risk management, providing a skilled workforce and improving the quality of the outcomes.

Predictions/Observations

The following related reports have been considered:

“A New Approach to Maintenance and Operations Procurement” – First Draft: Jan 2012 - PWC

“A Review of Delivery Models for Works and Services” – Draft: Jan 2012 – Opus

The key **success factors** as brainstormed by the Collaboration and Clustering research group have been considered in the discussion below also.

Fiscal Efficiency & Admin/Governance, Policy/Strategy: It is expected that the Government would get a better deal (fiscal efficiency) out of increased aggregation and bundling. There would be less administration, contract evaluation and reduced contract costs. With larger networks the governance, policy and strategic inputs would become more standardised and require less resources to achieve the appropriate outcomes.

Economic Efficiency & Private Sustainability: The PWC report identifies that as the contract sizes increase there will be a natural loss of competition as the smaller companies become less able to contest for work. This will make the smaller business less sustainable. PWC also note that there is a current trend towards larger contacts at present and yet competition has continued to intensify. This was demonstrated by the top 2 companies having a declining market share and the top 10 companies increasing their market share. It would suggest there is further room for aggregation and bundling without any negative impact on economic efficiency and private sustainability. PWC also noted that increasing the size of the contacts may also attract further competition from overseas companies.

Public and Political Acceptability: The public want to see that their tax and rate dollars are being spent in the most optimal way, without waste. They do not want increasing demands for their cash and yet they have increasing demand for improved levels of service. They also want to be assured that competition is maintained. The curve for public acceptability has been drawn relatively shallow as the public in general have very little visibility of how the maintenance and renewals of local roads and state highways are undertaken. It is believed they are not unhappy with the status quo, but may become increasingly dissatisfied if aggregation leads to large company dominance and small company exclusion. The public will have concern about declining representation, engagement and consultation with local communities, especially those that are isolated. This includes the awareness and needs of Tangata Whenua.

Politically, local authority politicians may see any aggregation as diminishing their control and influence on local transportation activities. Furthermore there is the perception that the viability of some local authorities would be seriously diminished if transportation activities were removed. Diminishing local employment and economic inputs/outputs will be negatively received. At the central government level it is anticipated there would be a mixed response to further aggregation and bundling. The political response may focus on how “pro big business” one side of parliament is compared to the other. Needing to weigh up both local and central politics the curve has been drawn to show that the status quo is about right and any move towards further aggregation and bundling will diminish political acceptability quickly.

Asset Management: Further network aggregation and bundling is anticipated to initially improve asset management through national consistency, performance measurement and innovation. Being able to define national priorities in a transparent and consistent manner will be a likely consequence. It is likely to remove the intense contestability for funding as there will be a move towards there being one goal and one source of the truth. The curve has been shown to taper off as it is anticipated that innovation and knowledge sharing will diminish.

Network Management: In a similar manner to administrative efficiencies, network management will improve and become more optimised with further network aggregation. The outcomes are expected to be more consistent and relative performance measurement improved. In a similar manner to asset management, it is anticipated that innovation and skill sharing will be compromised as increasing aggregation and bundling occurs.

Physical Works: It has been assumed that any aggregation and bundling, increasing the size of a network being administered by an AO, would naturally have a tendency to increase the size and value of the physical works contracts. In addition, these contracts are more likely to be performance/output based contracts, with longer terms. Increasing the size/value, duration and nature of the contracts has been assumed to improve the level of innovation, provide a higher skilled workforce, improve risk management, improve asset and network management and attract other larger firms to compete for these contracts. It is assumed this will lead to economies of scale with reduced costs and more efficient delivery. As with asset management and network management, it is anticipated that the innovation and efficiency elements will decline quickly as the size of the contracts increase and decreasing competition emerges.

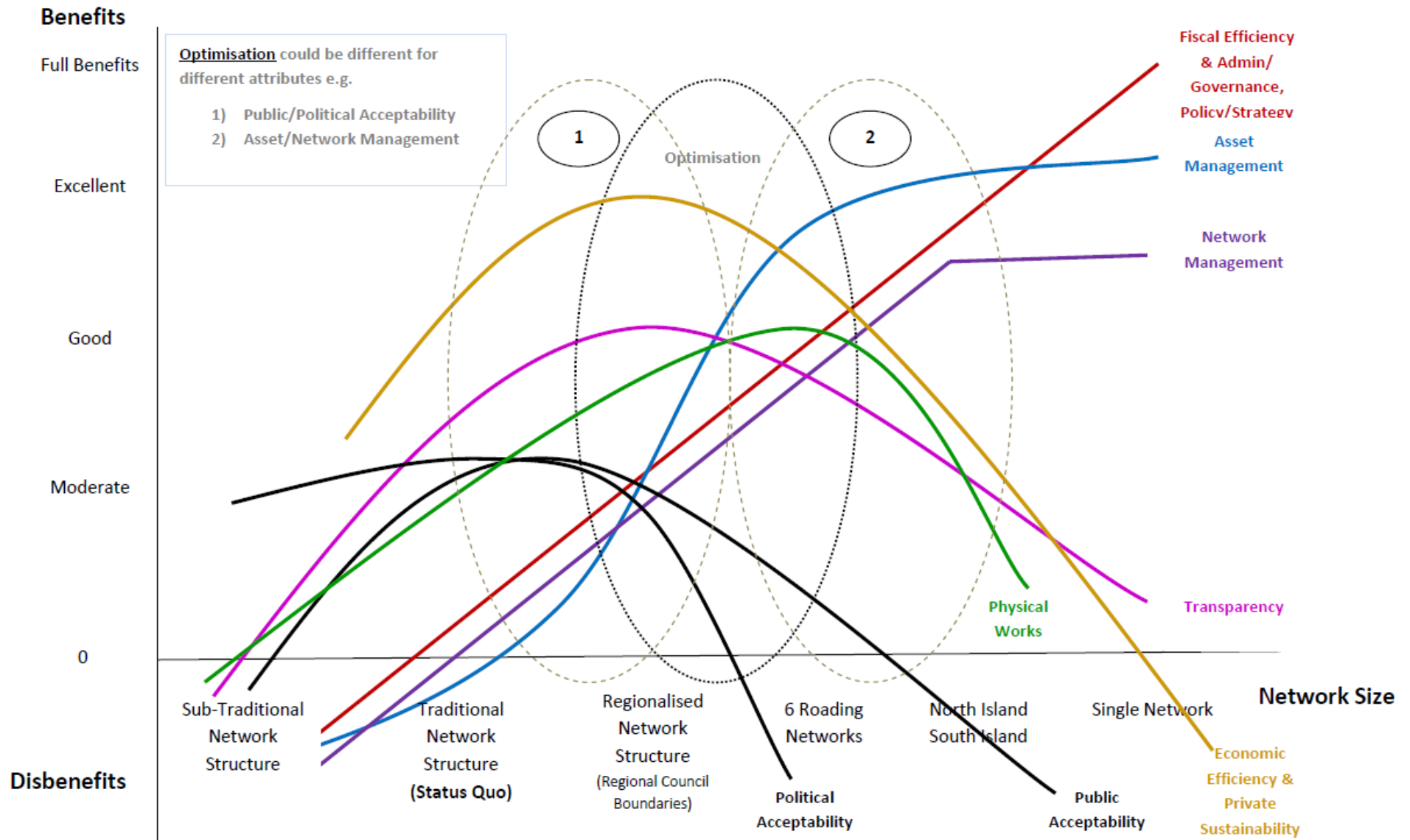
Transparency: Transparency is expected to increase initially with further aggregation and bundling. This is a consequence of more standardisation in contract content with less tendering and evaluation leading to more consistent decision making. The evolution towards more standard performance based contracts will further assist. With higher levels of aggregation and bundling, competition can be expected to diminish. This will have a negative effect on transparency.

Optimisation.

The graph has been optimised using a bubble. This assumes all attributes have the same weighting and is based purely on a visual analysis.

This analysis could be improved by initially by applying a simple numerical analysis that would demonstrate more precisely where the optimised solution is. This could be further improved by weighting the attributes if this was deemed necessary.

Collaboration and Clustering – Benefits vs. Size (In Principle). Network and Contract Size are assumed to have a direct correlation.



Appendix F - Ten Network Clustering Analysis

	Population 2011	Sum of Total Length	Sum of Local Road Unsealed Length	Sum of Total lane km	Sum of VKT (M)	Sum of 09/10 Total Maint Cost \$M	Sum of 09/10 Total Minor Capital \$M	Sum of 09/10 Total Cost for Clustering (\$M)
N1	260050	8331	4181	15876	2321	\$128.7	\$32.7	\$161.3
Far North District Council	58500	2541	1667	5083	263	\$22.4	\$2.9	\$25.2
Kaipara District Council	19150	1556	1124	2694	92	\$19.4	\$1.7	\$21.1
Northland NZTA RCO		749		1536	947	\$40.6	\$19.7	\$60.4
Rodney District Council	101900	1720	689	3233	581	\$29.6	\$4.4	\$34.0
Whangarei District Council	80500	1764	700	3330	438	\$16.7	\$3.9	\$20.6
N2	1334200	4914	151	10813	11439	\$222.7	\$85.8	\$308.4
Auckland City Council	456600	1476	95	3319	2797	\$57.3	\$11.2	\$68.5
Auckland NZTA RCO		343		1129	4490	\$81.2	\$30.5	\$111.8
Manukau City Council	383000	1289	17	2672	1824	\$35.9	\$4.8	\$40.8
North Shore City Council	232500	703	0	1449	1085	\$24.1	\$13.3	\$37.3
Papakura District Council	50700	301	3	588	275	\$6.0	\$7.3	\$13.3
Waitakere City Council	211400	802	37	1656	969	\$18.2	\$18.6	\$36.8
N3	402500	10784	1992	20817	5324	\$183.7	\$37.0	\$220.7
Franklin District Council	66200	1631	221	3263	487	\$17.2	\$2.0	\$19.2
Hamilton City Council	145300	606	1	1070	661	\$11.7	\$0.9	\$12.6
Hauraki District Council	18050	594	113	1081	71	\$7.7	\$0.2	\$7.9
Matamata-Piako District Council	32000	995	59	1990	169	\$9.8	\$0.8	\$10.6
Otorohanga District Council	9320	801	276	1602	57	\$4.6	\$0.4	\$5.0
Thames-Coromandel District Council	27000	676	242	1261	88	\$11.0	\$0.7	\$11.7
Waikato District Council	48900	1683	442	3088	319	\$21.5	\$1.4	\$22.9
Waikato NZTA RCO		1728		3632	3199	\$82.1	\$29.7	\$111.8
Waipa District Council	46100	1061	79	2121	232	\$10.4	\$0.6	\$11.1
Waitomo District Council	9630	1011	561	1709	43	\$7.5	\$0.4	\$7.9
N4	337690	5881	875	11618	2981	\$99.1	\$49.2	\$148.3
Bay of Plenty NZTA RCO		747		1594	1557	\$46.7	\$43.1	\$89.8
Kawerau District Council	6940	39	0	80	12	\$0.4	\$0.0	\$0.4
Opotiki District Council	8950	348	190	695	18	\$2.0	\$0.1	\$2.1
Rotorua District Council	68900	1003	162	1960	215	\$9.3	\$1.5	\$10.8
South Waikato District Council	22800	528	12	904	74	\$4.6	\$0.4	\$5.0
Taupo District Council	34100	763	82	1514	169	\$4.4	\$2.1	\$6.5
Tauranga City Council	115400	525	1	1050	568	\$10.8	\$0.9	\$11.7
Western BoP District Council	46100	1027	226	2022	162	\$12.1	\$0.7	\$12.8
Whakatane District Council	34500	902	203	1799	206	\$8.6	\$0.4	\$9.0
N5	181560	8254	2271	13403	2758	\$117.3	\$25.2	\$142.5
DOC (Manawatu-Wanganui)	0	6	6	12		\$0.4	\$0.0	\$0.4
Manawatu/Wanganui NZTA RCO		959		1987	1379	\$20.4	\$4.8	\$25.3
New Plymouth District Council	73800	1273	179	1886	222	\$11.6	\$0.7	\$12.2
Rangitikei District Council	14800	1224	443	2172	71	\$13.0	\$0.7	\$13.8
Ruapehu District Council	13400	1332	867	1847	97	\$11.5	\$0.9	\$12.4
South Taranaki District Council	26900	1621	274	2215	108	\$11.6	\$0.8	\$12.4
Stratford District Council	9160	598	221	1196	32	\$4.0	\$0.3	\$4.3
Taranaki NZTA RCO		391		819	677	\$35.2	\$15.5	\$50.7
Wanganui District Council	43500	850	281	1269	172	\$9.7	\$1.4	\$11.1
N6	201750	6872	2449	12101	1888	\$110.8	\$34.5	\$145.4
Central Hawkes Bay District Council	13500	1263	404	2526	75	\$8.5	\$0.6	\$9.0
Gisborne District Council	46600	1884	1043	2873	209	\$21.1	\$5.8	\$26.8
Gisborne NZTA RCO		331		663	179	\$26.1	\$2.9	\$29.0
Hastings District Council	75500	1628	367	3157	446	\$15.4	\$1.6	\$17.0
Hawkes Bay NZTA RCO		506		1001	670	\$23.4	\$22.7	\$46.0
Napier City Council	57800	356	0	657	263	\$5.7	\$0.5	\$6.2
Wairoa District Council	8350	904	635	1225	46	\$10.7	\$0.6	\$11.3
N7	648080	8622	1993	16024	4543	\$113.4	\$43.6	\$157.0
Carterton District Council	7650	441	158	877	35	\$2.5	\$0.2	\$2.7
Horowhenua District Council	30600	581	61	1162	165	\$4.3	\$0.2	\$4.6
Hutt City Council	103000	479	0	893	657	\$12.4	\$1.3	\$13.7
Kapiti Coast District Council	49800	389	13	768	158	\$4.7	\$0.4	\$5.1
Manawatu District Council	30000	1433	385	2866	216	\$8.7	\$0.3	\$9.1
Masterton District Council	23500	803	282	1304	132	\$5.9	\$0.2	\$6.1
Palmerston North City Council	82100	478	36	896	310	\$7.3	\$3.2	\$10.5
Porirua City Council	52700	242	1	469	189	\$3.6	\$0.2	\$3.8
South Wairarapa District Council	9430	661	281	1213	44	\$2.7	\$0.1	\$2.8
Tararua District Council	17700	1957	776	3155	86	\$10.6	\$0.8	\$11.4
Upper Hutt City Council	41500	238	1	437	143	\$3.6	\$0.2	\$3.8
Wellington City Council	200100	686	1	1352	680	\$24.1	\$5.5	\$29.6
Wellington NZTA RCO		236		631	1729	\$23.0	\$30.8	\$53.9
N8	127260	5384	1617	9869	1732	\$96.6	\$15.7	\$112.4
Buller District Council	10100	601	283	1202	38	\$3.8	\$0.3	\$4.0
DOC (Hokitika)	0	11	4	21		\$0.4	\$0.0	\$0.4
Grey District Council	13900	627	244	968	47	\$4.8	\$1.6	\$6.4
Nelson City Council	46200	259	14	509	207	\$4.3	\$0.3	\$4.6
Tasman District Council	48100	1702	772	3086	216	\$12.2	\$1.0	\$13.2
Tasman/Marlborough/Nelson NZTA RCO		645		1307	781	\$38.3	\$7.4	\$45.7
West Coast NZTA RCO		872		1741	406	\$28.8	\$4.9	\$33.7
Westland District Council	8960	668	300	1036	38	\$4.0	\$0.3	\$4.2
N9	625540	19014	7952	35310	5513	\$142.7	\$28.5	\$171.2
Ashburton District Council	30100	2630	1153	5176	173	\$8.3	\$0.8	\$9.0
Canterbury NZTA RCO		1327		2794	2252	\$43.2	\$20.8	\$64.0
Christchurch City Council	367700	2297	362	4186	1983	\$37.8	\$3.0	\$40.8
DOC (Mt Cook)	0	7	7	15		\$0.1	\$0.0	\$0.1
Hurunui District Council	11300	1455	854	2909	72	\$5.6	\$0.4	\$6.0
Kaikoura District Council	3860	205	100	318	14	\$0.7	\$0.0	\$0.7
Mackenzie District Council	4050	711	518	1394	19	\$2.2	\$0.2	\$2.3
Marlborough District Council	45600	1519	646	3038	139	\$9.6	\$0.7	\$10.4
Selwyn District Council	41100	2478	1115	4899	296	\$7.8	\$0.6	\$8.4
Timaru District Council	44700	1718	766	3203	181	\$10.3	\$0.8	\$11.1
Waimakariri District Council	48600	1501	651	3002	215	\$7.6	\$0.7	\$8.3
Waimate District Council	7630	1336	700	1678	36	\$2.7	\$0.2	\$2.9
Waitaki District Council	20900	1832	1081	2699	134	\$6.9	\$0.3	\$7.2
N10	285550	15884	8188	29345	3212	\$144.7	\$26.7	\$171.4
Central Otago District Council	18400	1880	1377	2871	72	\$5.3	\$0.4	\$5.7
Clutha District Council	17550	2907	2090	4669	108	\$11.5	\$0.7	\$12.2
Dunedin City Council	126000	1761	705	3485	449	\$20.7	\$4.2	\$24.9
Gore District Council	12300	894	539	1612	54	\$2.9	\$0.3	\$3.2
Invercargill City Council	53000	595	124	1189	239	\$7.5	\$0.8	\$8.3
Otago NZTA RCO		1300		2674	1296	\$35.9	\$12.3	\$48.2
Queenstown-Lakes District Council	28700	805	345	1323	167	\$17.9	\$1.8	\$19.7
Southland District Council	29600	4966	3009	9931	238	\$19.4	\$1.2	\$20.6
Southland NZTA RCO		778		1590	589	\$23.7	\$5.0	\$28.6
N11	640	179	168	310		\$2.8	\$0.0	\$2.8
Chatham Islands Council	640	179	168	310		\$2.8	\$0.0	\$2.8
Grand Total	4404820	94118	31837	175485	41711	\$1,362.5	\$378.9	\$1,741.4

Footnotes

State Highway data available by region only - data has not been apportioned for new boundaries
 Waitomo District could be split into North and South and be in 2 networks
 Consider splitting main transport corridors of 'Golden Triangle' into a separate network (3A). Would include RON's