



TECHNICAL REVIEW OF LOCAL ROADING
for
THAMES-COROMANDEL DISTRICT COUNCIL
Final Report

A blue ink signature of Tony Lange, written in a cursive style.

Review Team **Tony Lange, Senior Investment Auditor (Technical), NZTA**

A black ink signature of Stephen Griffin, written in a cursive style.

Stephen Griffin, Manager Operations, Buller District Council

A black ink signature of Cambell Snook, written in a cursive style.

Cambell Snook, Principal Programme Advisor, NZTA

A blue ink signature of Rob Merrifield, written in a cursive style.

Reviewed By **Rob Merrifield, Contractor pp: Rebecca George**

A blue ink signature of Marianne McMillan, written in a cursive style.

Approved By **Marianne McMillan, Investment Monitoring Manager**

Disclaimer

This is a final report. It has been prepared in the discharge of the NZ Transport Agency's legal responsibility to audit the performance of approved organisations in relation to activities approved by the NZ Transport Agency.

The findings, opinions and recommendations in the report are based on an examination of a sample only, and may not address all issues existing at the time of the review. So readers are urged to seek specific advice on particular matters and not rely solely on the report.

While every effort has been made to ensure the accuracy of the report, it is made available strictly on the basis that anyone relying on it does so at their own risk without any liability to the NZ Transport Agency.

KEY STATISTICS

Total length of local roading network:	675.8 km
Total length of sealed roads:	433.8 km
Total length of unsealed roads:	242.0 km
Total number of Bridges (plus length)	148 (1934.0 m) Restricted: 12, Timber: 7
Total cost of District Land Transport Programme <i>2010</i> : maintenance (NZ Transport Agency plus local authority):	<i>\$12.06million</i>
Total cost of District Land Transport Programme <i>2010</i> construction (NZ Transport Agency plus local authority):	<i>\$0.0million</i>
Base financial assistance rate:	<i>43%</i>
Population (<i>2006</i> Census - Source: www.stats.govt.nz)	<i>25,938</i>
Roading cost <i>2009</i> (NZ Transport Agency plus local authority) as a proportion of Council's Operating Expenditure: Source: localcouncils.govt.nz	<i>18%</i>
Number of Local Road Crashes in <i>2009</i> :	Fatal <i>0</i> Serious Injury <i>4</i> Minor Injury <i>30</i> Non Injury <i>46</i>
Estimated Social Cost of Local Road Crashes on Thames-Coromandel District Council's network in <i>2009</i> (from CAS):	<i>\$ 5.3million</i>

1. Executive Summary

Overall we feel that the network condition is good and delivering value for money. Our observations of the physical network are consistent with that shown by the network condition indicators.

Safety is a primary focus for Government and we recommend that Council adopt the findings from RISA, in particular to provide consistent signage and delineation of the network to mitigate the number of crashes that occur at bends and at night.

We support the initiative of Council to improve drainage systems across the network. This planned maintenance activity is likely to reduce costs of future emergency works. The challenge for Council is to prioritise this work with the prospect of limited financial support.

We found Council staff to be competent and cognizant of the issues faced across the network and provide a high level of service to NZTA. We observed a good sense of ownership which bodes well for the future of the network.

2. Recommendations & Suggestions

The following is a summary of our recommendations and suggestions. In some cases, this section of the report may carry an abbreviation of the full wording. The appropriate section of the report should always be referred to for the full statement in its context.

We recommend that Council:

1. Considers the suggestions for improvement noted in Business Management (see section 6).
2. Reviews the carriageway surface life table against the achieved surface life cube values (see section 7); and
3. Adopt the recommendations and suggestions contained in the RISA report. (see section 14);

3. Scope

The Land Transport Management Amendment Act 2008, section 95(1)(e)(ii), requires the NZ Transport Agency (“the Agency”) to audit the performance of approved organisations in relation to activities approved by the Agency.

We visited Thames-Coromandel District Council on 22 to 24 June 2011. Enquiries made of Thames-Coromandel District Council were generally limited to the issues covered by the Audit Plan (refer Appendix A).

Thames-Coromandel District Council has provided comment on the draft report. Council’s comments (see Appendix B) have been taken into account in preparing the final report. Any changes made as a consequence of their comments are indicated (*in italics*) in the report.

4. Acknowledgments

The contribution provided by Stephen Griffin to the work of the team and the agreement of Buller District Council to allow Stephen to take part in this review is gratefully acknowledged.

We are grateful for the time and effort spent by staff from Thames-Coromandel District Council in preparing for and taking part in the review. The time they spent in discussion with us was appreciated, as was the hospitality extended by Council.

5. Progress since last review

The previous technical review was conducted in August 2005 (PM06/1144T). The report concluded that the road condition was progressively improving.

- While there was a backlog of resealing needs, Council has since increased its resurfacing programme with a consequential betterment in the Surface Condition Indicator.
- A high proportion of pavements are greater than 150 NAASRA counts (rough ride). We support Council's policy of not smoothing those roughest pavements that are on low speed low traffic volume urban roads though would suggest isolated smoothing, e.g. around service covers and trench lines, is undertaken as part of the pre-seal repair programme.
- The cross fall on unsealed roads has improved and is now similar to the specified cross-section shape for unsealed roads. Isolated sections with poor cross fall still remain that need correcting.
- Council's Road Asset Maintenance Management (RAMM) database is well maintained with a small proportion of discrepancies. Our analysis indicates that Council has not reviewed the original values of default surface life against achieved life. By altering these values in light of local experience, we believe Council can gain a better guide to necessary action from RAMM's treatment selection process.
- Council still places a high dependence on consultants to carry out network management and to supply professional services. Council needs to ensure that for maintenance activities, specifications are complied with.
- A draft Safety Management System was prepared in 2004 but this has been set aside until more urgent issues have been attended to by relevant staff.

6. Business Management

Management of the road network is predominantly performed by consultants to manage day to day operations and provide professional services.

Council employs two staff to manage the road network, the Roding Manager and an assistant engineer. The focus for Council staff is to manage finances, undertake strategic planning, monitor contract performance and manage customer service.

We evidenced a good level of understanding of roles and cooperation between Council and consultants during the review.

Areas of improvement for Council would be to

- Seek an Improvement in contractor performance - ensure the contractor meets the targets set in the maintenance contract. We encountered a bridge site (Figure 3, page 10) that had sustained damage and presented a safety risk. It was communicated by staff that the incident had occurred several weeks earlier and was now outside of the response times set in the

maintenance contract. This issue of non compliance was common to the current maintenance contract.

Council comment

Seek contractor performance improvement. Changes to our road maintenance contractor's management staff in mid-July 2011 have resulted in performance improvements, through a more proactive approach to achieving specified levels of service.

- Develop a strategy to manage the 29 fords for safe crossing risk. We were concerned at lack of information at fords to enable motorists to determine if a ford was safe to cross, e.g. Kaureranga Valley Road (see Figure 1 below). We saw little evidence of signage or depth and flow indicators to assist with the decision making process particularly when the river condition is difficult to judge. This issue was identified in the AMP 2009 and requires action.

Council Comment

Develop ford management strategy. Improved maintenance of ford delineation across the district was raised as a performance issue and area of focus for our maintenance contractor following this review. Painting depth bands on ford edge marker posts and installation of water depth guide signage at ford approaches has been tasked to our road maintenance contractor, to improve motorist awareness of the water depths when crossing fords.



Figure 1 Kaureranga Valley Road ford

- Continue to evolve the current AMP to meet best practise guidelines. The 2009 version is cumbersome, suggests copy and paste from many different sources (multiple fonts and line spacing), is repetitive, difficult to navigate and hard to fathom the direction needed for Council to achieve an affordable value for money network against the Level of Service (LoS) targets and performance indicators.

Council comment

Continue AMP evolution. The 2009 transportation asset management plan continues to be refined and was recently updated as a part of the 2012-22 Ten Year Plan and 2012-15 NLTP development processes. The updated AMP can be viewed on NZTA's Transport Investment Online (TIO) system.

- Ensure resurfacing solutions are appropriate i.e. use of grade 2 chip on an urban cul de sac (Emmerdale Drive) is not appropriate and we suspect outside the LoS conditions set in the AMP.

Council Comment

I believe Council's resurfacing treatments are appropriate. The Emmerdale Drive resurfacing treatment was a grade 2/4 chip seal (not grade 2 as stated in the draft report). A two coat seal is considered appropriate for this site to address severe surface flushing, whilst withstanding chip lose through turning stresses and ultimately maximising surface life. Based on site conditions, a grade 3/5 chip seal was the original (and preferred) treatment, however due to this site being the only grade 3/5 treatment in the vicinity, we decided to construct a grade 2/4 to minimise the sealing chip supply cost.

NZTA response: We are happy with the explanation provided.

7. Road Asset Management System

When preparing for this review we encountered some errors with reports from RAMM however these errors may be the result of a recent upgrade to RAMM 2011.

Issues identified in the previous review around surface lives and quality audits have not yet been resolved.

We recommend that Council:

- Review surface lives in the Carriageway Surface table against values in the achieved surface life cube and adjust where necessary to best reflect local conditions and aggregates. This will benefit short term forward planning (TSA) and long term dTIMS modelling.

Council comment

Review surface design lives in RAMM. The RAMM Carriageway Surface table was updated in June 2011 to better reflect surface lives being achieved. This update included local lifecycle variations to account for local ground conditions, such as extended seal lifecycles in areas with free-draining sand sub-grades (for example Matarangi and Pauanui).

- Validate RAMM data to ensure accurate and timely reporting. We encountered a number of irregularities with RAMM reports when preparing for this review. This may coincide with the recent upgrade to 2011.

Council Comment

Validate RAMM data, I believe this section of the draft report is incorrect. The cause of the 'irregularities encountered with RAMM reports' were confirmed (some weeks following the review) to be as a result of NZTA linking graphs to the incorrect RAMM data, when preparing for the review and not as a result of inaccurate RAMM data as stated.

NZTA response: This issue was resolved satisfactorily.

- Ensure all assets are recorded in RAMM e.g. retaining walls, fords, signs and guard rails. This was identified for action in the 2009 AMP improvement plan.

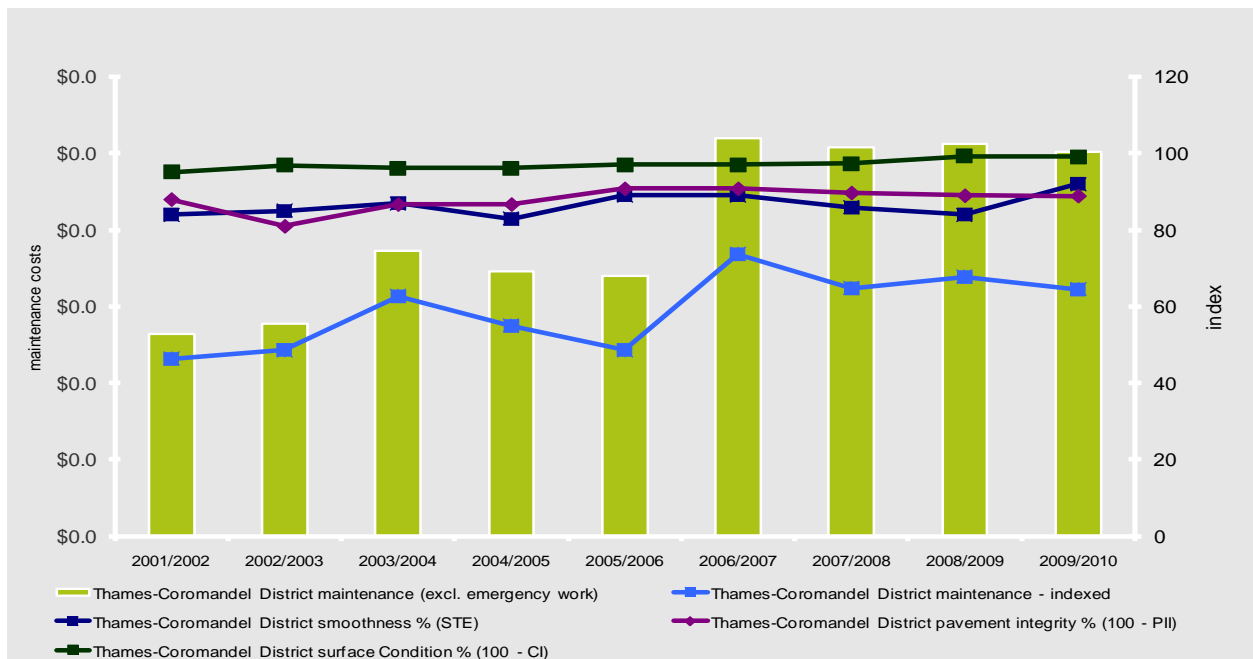
Council Comment

Ensure all assets are recorded in RAMM. Council has a programme aimed at updating one RAMM table annually, including inventory data collection as required. RAMM tables updated in recent years include the traffic & loading and the sign and markings tables. Tables programmed for updating in the coming years include the structures table (to allow improved risk management) as well as the pavement strength table (to improve accuracy of pavement deterioration modelling).

8. Sealed Road Condition Trends

The condition of the sealed network has improved over the period as shown in graph 1 below. Of concern is the significant step change in expenditure for structural maintenance between 05/06 and 06/07 with no change in the condition indicators.

Graph 1 Sealed network condition vs. indexed network structural maintenance *



* For programmes funded through NZTA only

In summary the pavement condition (PII) has been stable but is still below NZ values. The surface condition has improved over the last 10 years and is now better than NZ values. Smooth Travel has been constant and while better than NZ values it is below its peer group. Roughness values are consistently greater than the region and all New Zealand values.

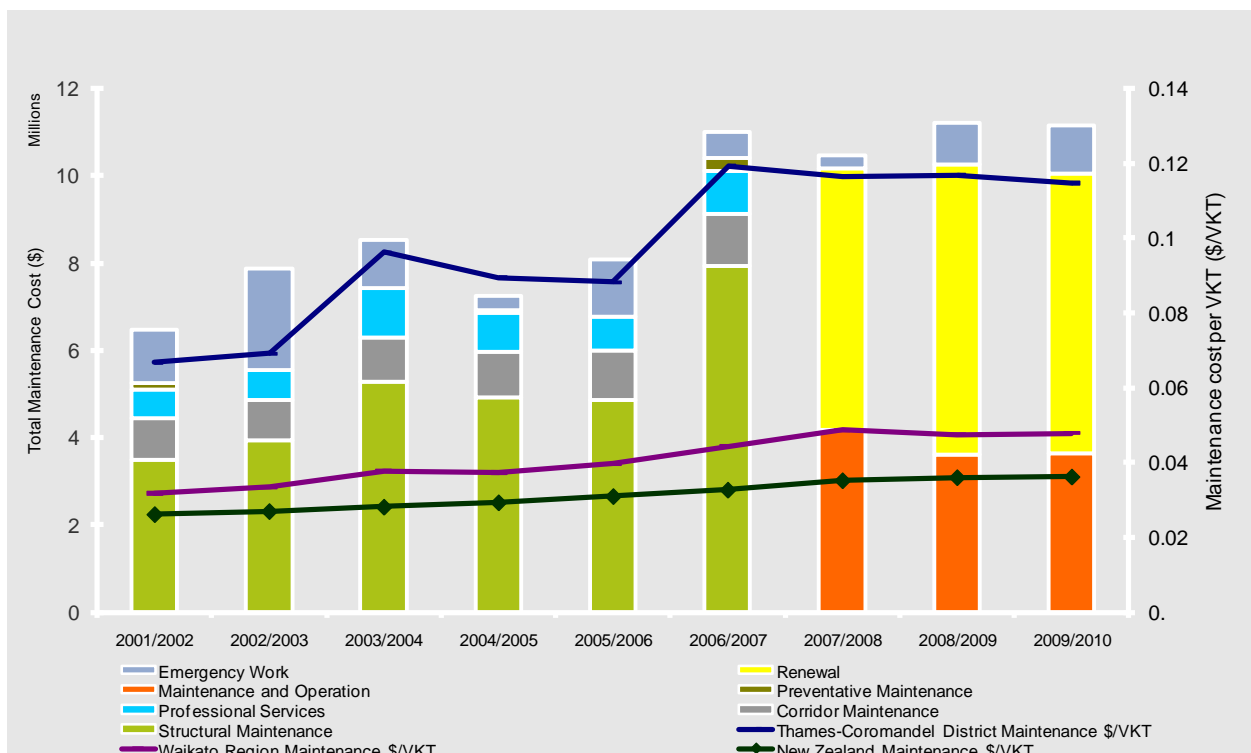
Graphs for all condition indicators, including roughness, can be found in Appendix D.

9. Sealed Pavement Maintenance

Historically, Council's structural maintenance programme has been resurfacing an average of 46.0 km per annum for the period 2006/07 to 2009/10, which is greater than the 35.2km per annum indicated by long term database analysis. Analysis of the Resurfacing Achievement report in RAMM shows a noticeable increase in surface activity from 2006/07 of 12km per annum. This corresponds to the step change in funding indicated in Graph 1 above and Graph 2 below. At the same time there has been an average increase in first coat seals of 3.2km per annum from either new construction or rehabilitation works. The 2006 technical review recommended that Council address the backlog of reseals and Council has responded.

The increase in resurfacing has reduced the backlog of surfacing overdue and this is now reported at 10% of the sealed network length. This increase corresponds with a small improvement of the surface condition indicator, a measure of surface defects.

Graph 2: Total maintenance cost and cost per VKT (NZTA + local share)



Analysis of the Achieved Surface Life table and the Carriageway Surface table in RAMM reveals a disparity between values of design and achieved life with achieved life exceeding design life values. Adjusting the design life values to reflect actual life values may reduce the amount of overdue surfacing. These changes to increasing the resealed length, the improvement in surface condition and a reduction in the surface overdue for resurfacing indicate that Council may be in a position to reduce its reseat programme in the short term and provide a cost saving.

We inspected 2 sites on Council's renewal programme, Hahei Beach Road and Te Kouma Road. On the visible evidence we would endorse the rehabilitation of Hahei Beach Road but not for Te Kouma Road where we observed little evidence of pavement failure. Evidence of pavement failure is required to support an application for funding in Work Category 214 where other forms of maintenance and renewal are no longer economic and show that full rehabilitation is the preferred whole of life option.

10. Unsealed Road Maintenance

Unsealed roads travelled on during the inspection were in good condition. We acknowledge that Council has responded to the recommendation to improve cross fall from the previous review. Considerable effort had been made to improve surface cross fall and increase sight distance on tight blind curves across the network. However we saw a number of potholes on isolated sections of unsealed road. This suggests further work is required to achieve a best practise cross fall of greater than 4 % across the entire network. We would encourage Council to continue to adjust surface cross fall as part of its unsealed road metalling programme (WC 211).

Drainage maintenance is very important for Council with such a hilly topography and with frequent high rainfall events. We would remind Council of the need to regularly inspect surface drains to ensure they function correctly with the optimal time for inspection being during a rainfall event. We observed that some cut out drains did not function correctly due we believe to routine grading operations undercutting the wipe off drain (see Figure 2 below). By not re-establishing the wipe off Council faces excessive scour of the drainage channel and the possibility of drop outs that will lead to future emergency works.



Figure 2: Storm water run-off missing cut out drain

11. Bridges & Structures

Bridges and structures observed during the review were generally in good condition.

Of concern was the excessive time taken to repair damage to a bridge on Hot Water Beach Road (Figure 3 below). While aware of the damage the maintenance contractor had not progressed the repair in accordance with the time requirements set in the contract. Council was aware of the damage and the time overrun yet the site still poses a safety risk until the repairs are complete. Council need to ensure

that contractual requirements are met by contractors and those contractors are aware of the consequences of poor performance.



Figure 3: Bridge damage, Hot Water Beach Road

However we were encouraged by Councils action to repair McNeils Bridge on Waimanu Rd following the failure of a downstream pile. We were particularly pleased to hear of the innovation shown by Council to resolve the problem. This came through the early involvement of a specialist bridge contractor to assist with identifying practical solutions and the direct appointment of a contractor to undertake the repair work. The approach taken by Council was innovative and provided a timely and cost effective solution.

12. Environmental Maintenance & Traffic Services

Overall environmental and traffic service maintenance was to a good standard. Drainage channels were clear of detritus and markings were in good condition.

13. Minor Improvements

Council has a seal extension and sight benching programme underway to improve safety across the network.

We would encourage Council to continue with the seal extension programme in particular at intersections, bridge approaches and on steep grades across the unsealed network to reduce ongoing maintenance costs. At intersections and at bridge approaches the minor seal extension should extend beyond the safe stopping sight distance for the typical approach speed. For example the seal length will be 100m for an approach speed of 100 Km/h to an intersection, not the 50m that has been adopted in past years. This added length provides sufficient length for vehicles to accelerate and brake on a sealed surface, allows for full intersection markings, lowers maintenance costs, reduces the incidence of detritus at the intersection and provides a better transition for cross fall from a sealed to an unsealed surface.

14. Safety Management

The Government has embarked on a Safer Journeys Strategy with the objective to lower our road toll. A key feature of the strategy is the safe system approach that views the road system holistically with safe roads and roadsides being one element of the system. Safe roads and roadsides are predictable and

forgiving of mistakes. And Councils have a significant role to build and maintain safe roads and roadsides.

To support the Safer Journeys Strategy the NZTA has just released the High Risk Rural Road Guide, HRRRG, (<http://www.nzta.govt.nz/resources/high-risk-rural-roads-guide/>). In the guide reference is made to the Road Infrastructure Safety Audit (RISA), a tool used to assess sealed rural roads against a best practise road. The guide classifies a rural road as being of high risk when the RISA score for collective risk is greater than 3.

A Road Infrastructure Safety Audit was conducted in February 2011 and surveyed a sample of the network. The results when measured against the HRRRG indicate no roads of high risk i.e. greater than 3, though Hahei Beach Road was close with a score of 2.6.

The RISA did identify the following areas for incremental improvement across the network:

- Increase shoulder widths and Improve cross fall grades for vehicle safety (during AWPT)
- Realign severe curves (Worst)
- Review application of Delineation based on hierarchy
- Rationalize curve advisory signage
- Review intersection Controls (e.g. Old Maratoto / Block Rd)
- Consider seal backs at gravel intersections
- Road marking to clearly define turning paths
- Signage (Diverge Chevrons, Street name blades etc)

The RISA report has been provided Council.

We recommend that Council adopt the recommendation and suggestions contained in the RISA report.

Council Comment

Council continues to implement the February 2011 RISA recommendations and suggestions as detailed in our response to the draft RISA report.

APPENDIX A

Technical Review Audit Plan 2010/10

Authority: Thames-Coromandel District Council
Sponsor: Business Improvement Manager
Project Manager: Tony Lange, Senior Investment Auditor (Technical)

Target Audience:

NZ Transport Agency General Manager Regional Partnerships & Planning (GM RP&P) and Thames-Coromandel District Council

Intended Outputs of the Review:

A report to the GM RP&P, assessing progress with Thames-Coromandel District Council's maintenance activities on its local roading network and noting any potential risks to successful delivery of the Land Transport Programme.

Authority to Review:

The Land Transport Management Amendment Act 2008, section 95(1)(e)(ii), requires the NZ Transport Agency ("the Agency") to audit the performance of approved organisations in relation to activities approved by the Agency. The NZTA Business Improvement Unit's Charter describes the way this statutory requirement will be performed. The Charter refers to regular procedural audits and regular technical reviews of road controlling authorities. This report is a technical review.

The Land Transport Management Amendment Act 2008, section 95(1)(g), requires Agency staff to assist and advise approved organisations. Technical reviews provide one opportunity for this.

Review Objectives:

1. To review progress since the last technical review.
2. To assess whether the level and quality of roading maintenance being carried out by Thames-Coromandel District Council is realistic and acceptable.
3. To determine the extent to which Thames-Coromandel District Council's Operations & Renewals maintenance is meeting (not exceeding) maintenance needs.
4. To determine the extent to which Council's road assessment & maintenance management database is able to provide reliable reports and treatment selections.
5. To determine whether in light of answers to the above questions there is progress towards achieving a balanced whole of life maintenance programme.

Review Team:

- Tony Lange, NZ Transport Agency;
- Stephen Griffin, Buller District Council; and
- Cambell Snook, NZ Transport Agency.

APPENDIX B

Comments from Auditee on the Draft Report



27 February 2012

New Zealand Transport Agency
Airport Business Park, Unit C
P O Box 1479
Christchurch 8140

Attention: Tony Lange

Dear Tony

RE Thames Coromandel District Draft Technical Report

I would like to thank the audit team for their professionalism and constructive feedback during the course of what I felt was a very fair technical review of the Thames-Coromandel transport network.

I've read the draft report for the June 2011 Technical Review and make the following comments regarding the draft recommendations:

1. Business Management Improvements (section 7)

- Seek contractor performance improvement. Changes to our road maintenance contractor's management staff in mid-July 2011 have resulted in performance improvements, through a more proactive approach to achieving specified levels of service.
- Develop ford management strategy. Improved maintenance of ford delineation across the district was raised as a performance issue and area of focus for our maintenance contractor following this review. Painting depth bands on ford edge marker posts and installation of water depth guide signage at ford approaches has been tasked to our road maintenance contractor, to improve motorist awareness of the water depths when crossing fords.
- Continue AMP evolution. The 2009 transportation asset management plan continues to be refined and was recently updated as a part of the 2012-22 Ten Year Plan and 2012-15 NLTP development processes. The updated AMP can be viewed on NZTA's Transport Investment Online (TIO) system.
- Ensure appropriate resurfacing treatments. I believe Council's resurfacing treatments are appropriate. The Emmerdale Drive resurfacing treatment was a grade 2/4 chip seal (not grade 2 as stated in the draft report). A two coat seal is considered appropriate for this site to address severe surface flushing, whilst withstanding chip lose through turning stresses and ultimately maximising surface

life. Based on site conditions, a grade 3/5 chip seal was the original (and preferred) treatment, however due to this site being the only grade 3/5 treatment in the vicinity, we decided to construct a grade 2/4 to minimise the sealing chip supply cost.

2. Road Asset Management System (section 8)

- Review surface design lives in RAMM. The RAMM Carriageway Surface table was updated in June 2011 to better reflect surface lives being achieved. This update included local lifecycle variations to account for local ground conditions, such as extended seal lifecycles in areas with free-draining sand subgrades (for example Matarangi and Pauanui).
- Validate RAMM data. I believe this section of the draft report is incorrect. The cause of the 'irregularities encountered with RAMM reports' were confirmed (some weeks following the review) to be as a result of NZTA linking graphs to the incorrect RAMM data, when preparing for the review and not as a result of inaccurate RAMM data as stated.
- Ensure all assets are recorded in RAMM. Council has a programme aimed at updating one RAMM table annually, including inventory data collection as required. RAMM tables updated in recent years include the traffic & loading and the sign and markings tables. Tables programmed for updating in the coming years include the structures table (to allow improved risk management) as well as the pavement strength table (to improve accuracy of pavement deterioration modelling).

3. Adopt the Road Infrastructure Safety Assessment (RISA) recommendations and suggestions.

Council continues to implement the February 2011 RISA recommendations and suggestions as detailed in our response to the draft RISA report.

Please contact me on (07) 868 0312 if you have any further queries.

Yours faithfully



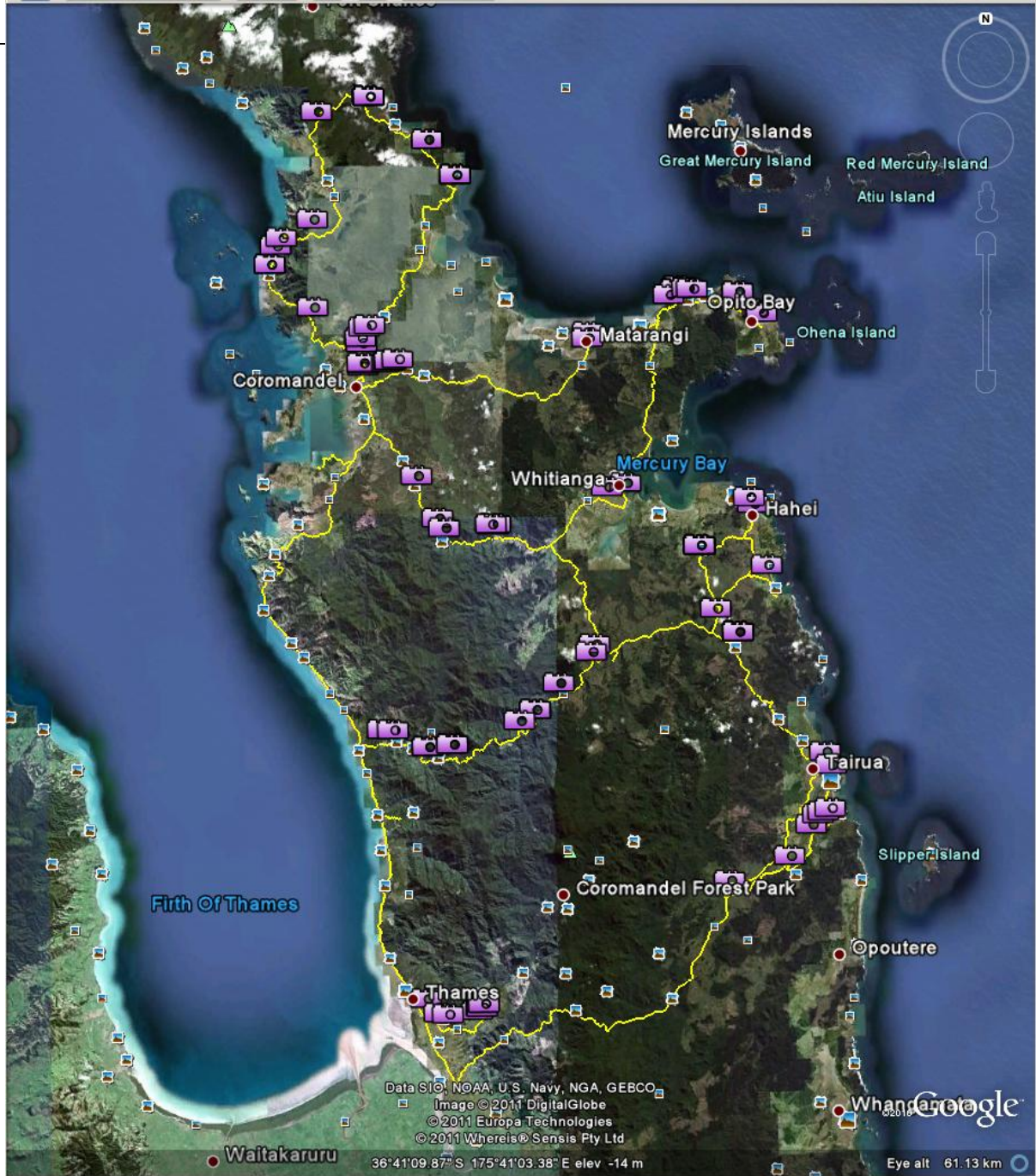
Matt Busch
Roading Manager
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APPENDIX C

Route Travelled by Review Team

Route travelled, in yellow, includes State Highways which are not commented on as part of this review
Camera icon is the approximate position of photos taken during the review



(Source Google Earth)

APPENDIX D

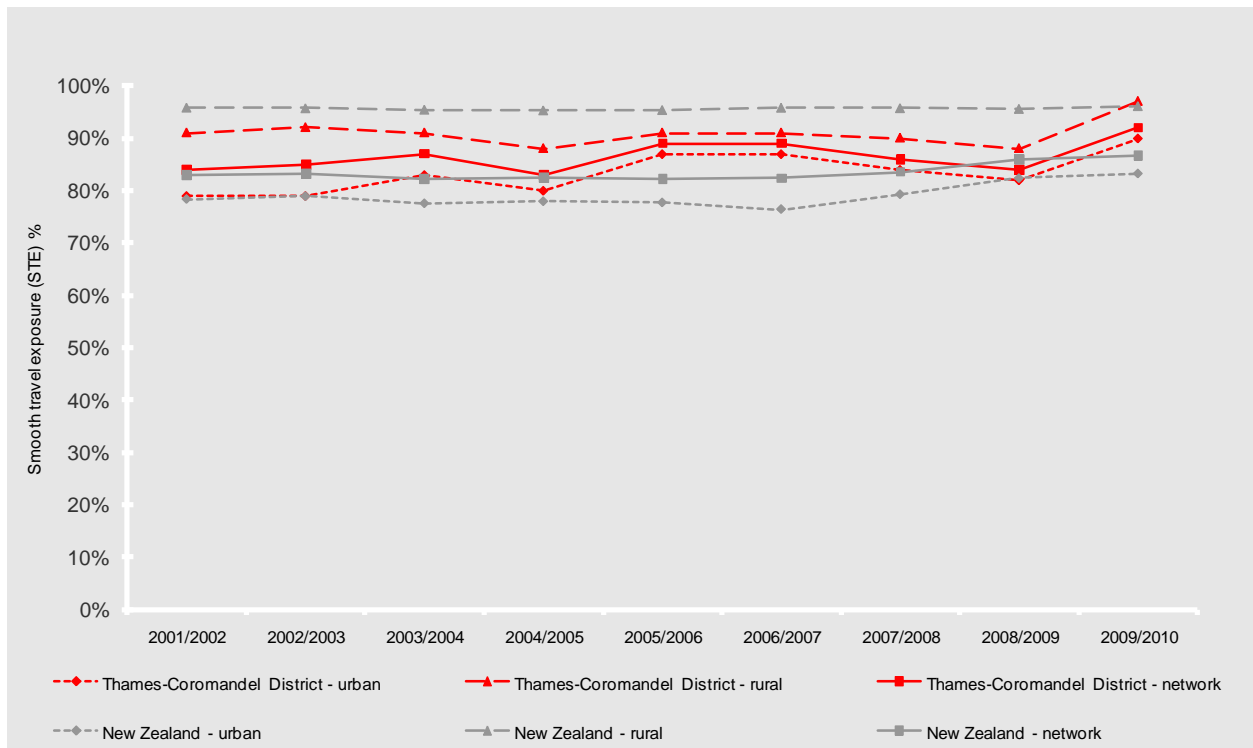
Sealed Network Condition Trends - Supporting Data

The STE, CI and PII indicators utilised by the NZ Transport Agency for consideration of pavement condition are derived from the following input data:

Table 1: Input Data to Pavement Indicators

Indicator	Input Data
Smooth Travel Exposure (STE) (Note - no weighting of data.)	Percentage of travel undertaken on sealed roads with roughness less than 5.71 IRI (150 NAASRA counts/km).
Condition Index (CI)	%age of alligator cracking %age area of scabbing %age area of potholes %age area of pothole patches %age area of flushing
Pavement Integrity Index (PII)	As for Condition Index (CI), plus %age of Rutting Average roughness %age of Shoving

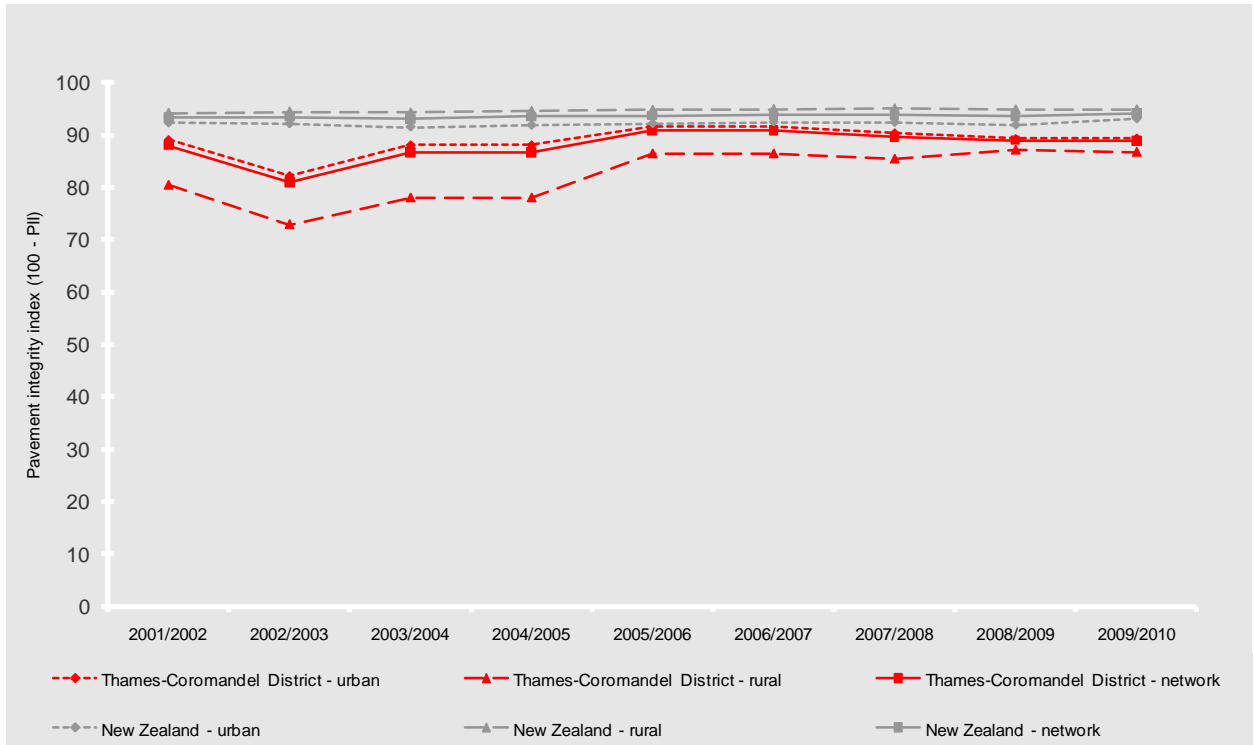
Graph 2: Smooth travel exposure for all sealed roads



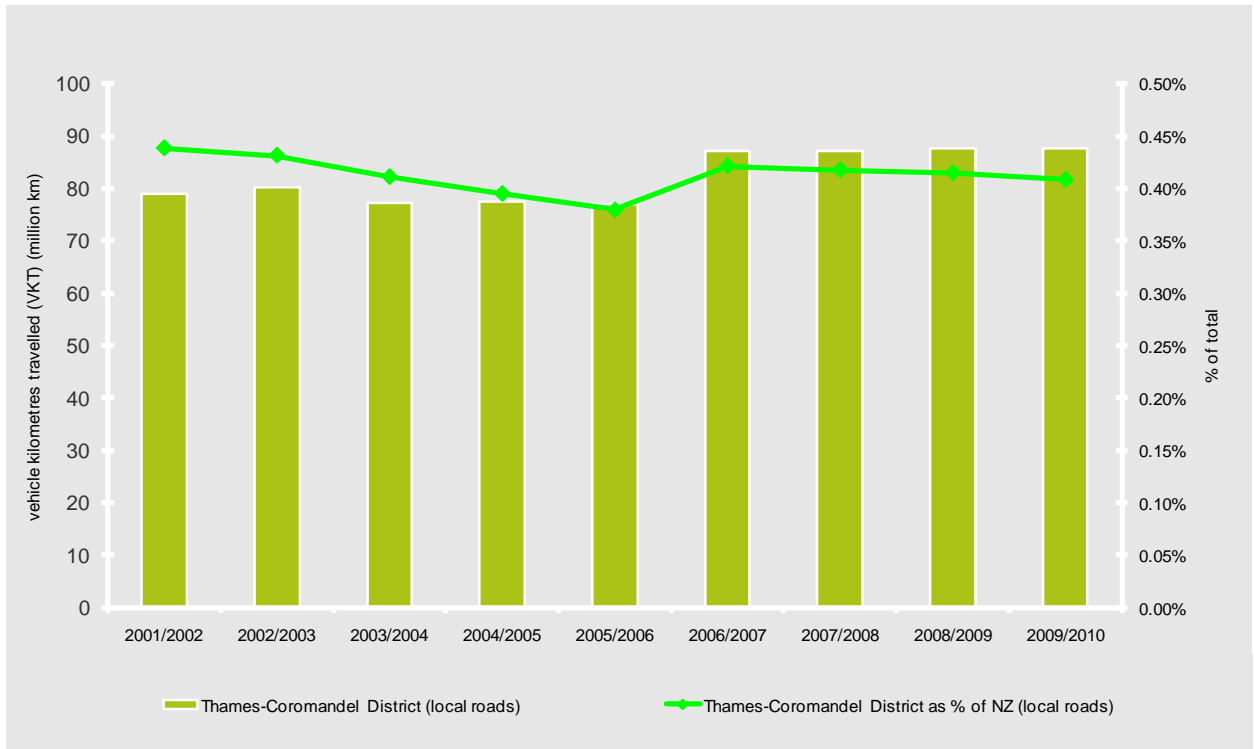
Graph 3: Surface Condition for all sealed roads



Graph 4: Pavement Integrity for all sealed roads



Graph 5: Vehicle kilometres travelled on local roads



The proportion of Council’s sealed roads exhibiting a roughness count of greater than 5.71 IRI (150 NAASRA) has been *generally rising* over the last 5 years. Overall, the Thames-Coromandel District Council network has a *greater* proportion of “rough” roads in comparison with the Waikato region authorities.

Graph 6: Road Roughness

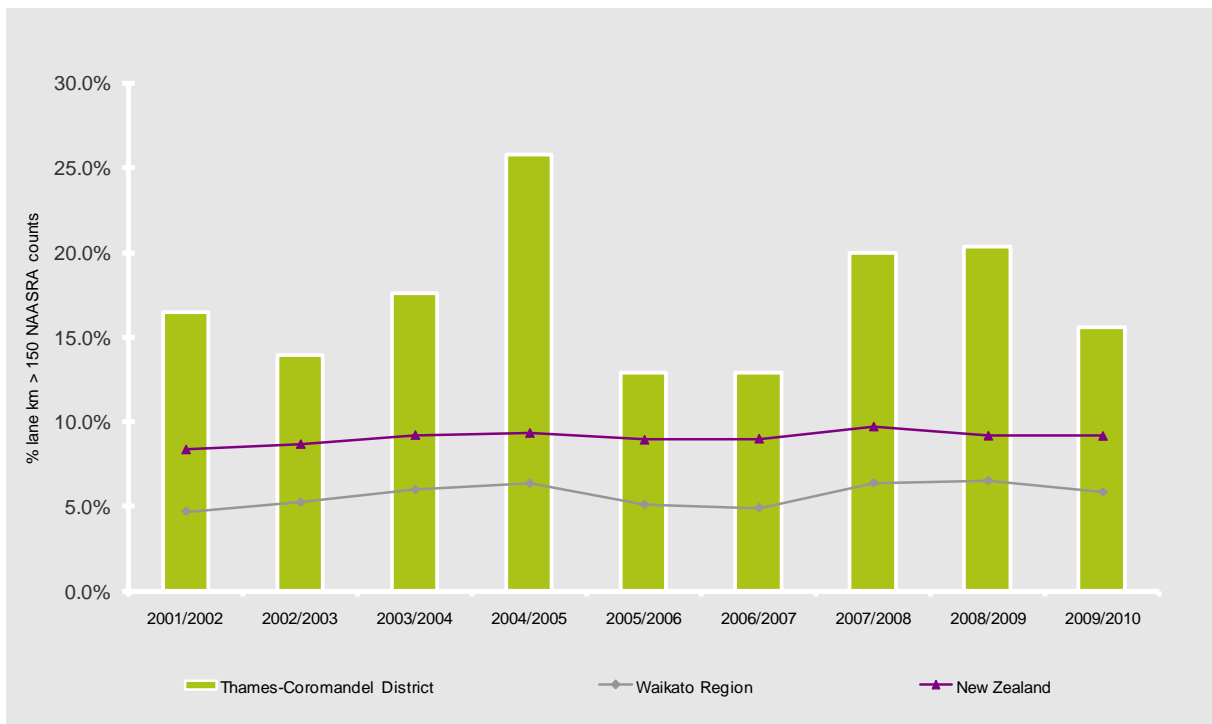


Table 2: Pavement Roughness Data (>5.71 IRI per km)

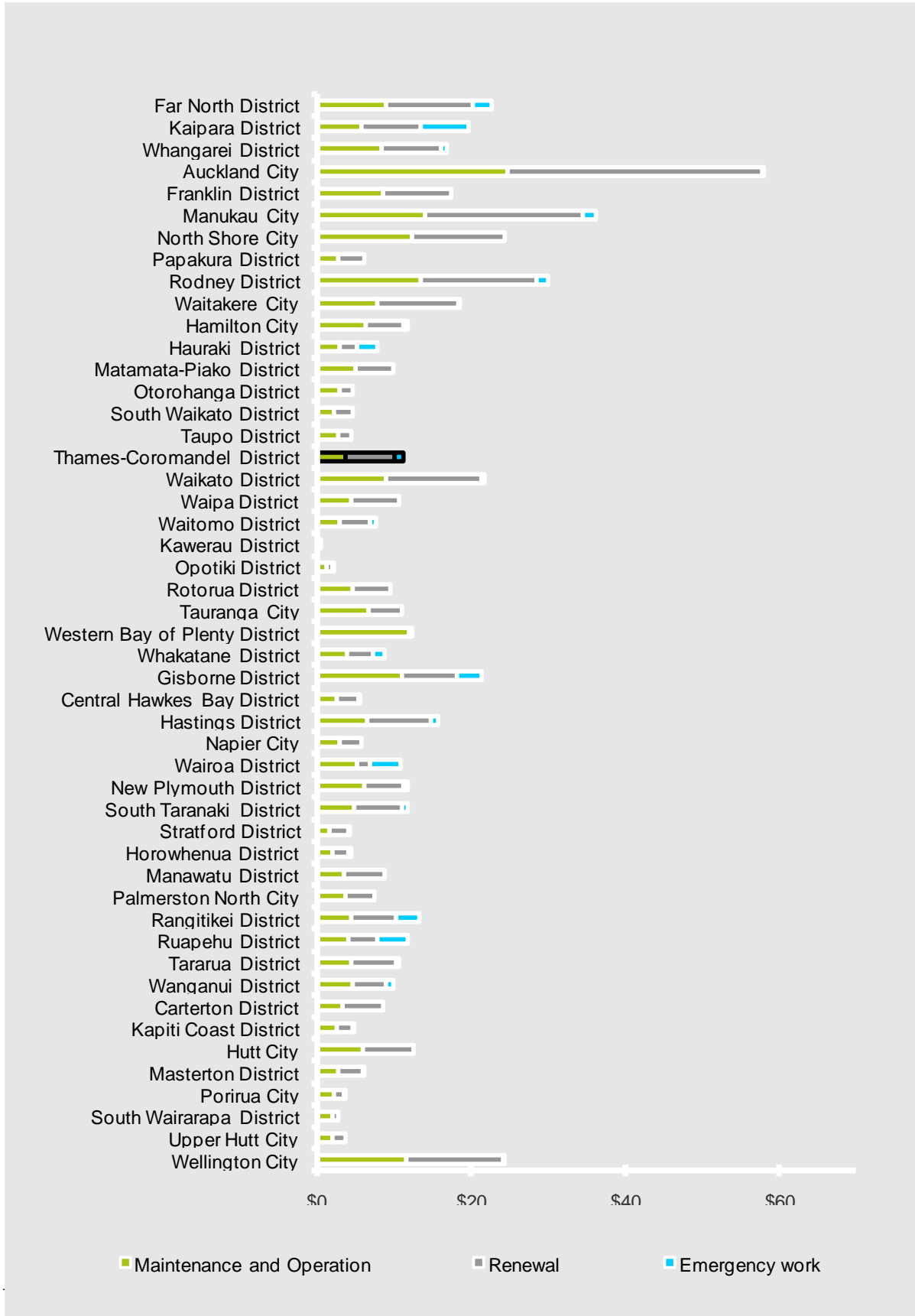
	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08
Thames-Coromandel							
District	0.17	0.14	0.18	0.26	0.13	0.13	0.20
Waikato Region	0.05	0.05	0.06	0.06	0.05	0.05	0.06
New Zealand	0.08	0.09	0.09	0.09	0.09	0.09	0.10

Any apparent inconsistency between measured pavement roughness and STE relates to roughness being an absolute value, whereas STE takes account of both roughness and traffic volumes on individual RAMM treatment lengths. A busy street will return a lower STE value than will one with little traffic, roughness counts being equal. Such streets may have a very low priority for smoothing treatment, if any is actually needed. Urban roughness may be acceptable, providing the integrity of the pavement (and hence its ability to shed water) is not compromised.

APPENDIX E

Comparison of Maintenance and Renewal Costs

Maintenance & operation of local roads (activity class 8) minus emergency reinstatements (work category 141)



New & improved infrastructure for local roads (activity class 12)

