

NZ TRANSPORT AGENCY INVESTMENT AUDIT REPORT

Monitoring Investment Performance

Report of the investment audit carried out under Section
95(1)(e)(ii) of the Land Transport Management Act 2003.

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Approved Organisation (AO):	Kāpiti Coast District Council
Date of Investment Audit:	1–4 April 2019
NZ Transport Agency Investment (2018 – 2021 NLTP)	\$12,893,800
Audit Team:	Dawn Shannon, Investment Auditor, NZTA (Lead) Ranjith De Silva, Senior Asset Roading Engineer, AT Jason Morgan, Senior Investment Advisor, NZTA
Report No:	RADST-1835

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EXECUTIVE SUMMARY

Kāpiti Coast District Council's road network asset is well managed and is in a stable condition. Overall, the road maintenance and operations are currently delivering transport outcomes at an appropriate level of service. Council's strong emphasis on improving data quality is particularly commendable.

No significant deterioration of the physical network was noted during the audit field visits. However, expenditure per network km is less than peer councils. Council has chosen to under-invest, relative to its peers, and the long-term potential impact on the network needs to be described in the 2021–24 Activity Management Plan (AMP). The AMP should give a comprehensive assessment of network need, whole-of-life asset cost and funding requirements for future years, i.e. demonstrate value for money. The AMP should also reflect the good operational and management strategies being used to manage the network.

Statistics for deaths and serious injury are trending upwards and we encourage Council to review the cause(s) to assess if any change of focus is required. The Council's safety improvement projects appear well designed and implemented to achieve the project's desired outcomes. Work undertaken through the Road Safety Promotion programme is effectively promoting the safe use of modal transport alternatives (such as the Stride and Ride network), as well as supporting behavioural changes which should improve road safety.

Key challenges facing Council include the Mackays to Peka Peka revocation (of old state highway) and the accelerated rate of growth due to the construction of the Wellington Northern Corridor. The new links to this major corridor are generating significant traffic reassignment across the local road network and are creating a significant upsurge in development and subdivision. We consider that Council is managing these risks.

DISCLAIMER

While every effort has been made to ensure the accuracy of this report, the findings, opinions, and recommendations are based on an examination of a sample only and may not address all issues existing at the time of the audit. The report is made available strictly on the basis that anyone relying on it does so at their own risk, therefore readers are advised to seek advice on specific content.

SUMMARY AUDIT RATING ASSESSMENT

Subject areas		Rating Assessment*
1	Previous Audit Issues	Effective
2	Network Condition and Management	Effective
3	Activity Management Planning	Some Improvement Needed
4	Data quality	Effective
5	Road Safety	Effective
Overall Rating		Effective

* Please see Introduction for Rating Assessment Classification Definitions

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RECOMMENDATIONS

The tables below capture the audit recommendations. Agreed dates are provided for the implementation of recommendations by the approved authority.

We recommend that Kāpiti Coast District Council:		Implementation Date
R3.1	Standardise asset specifications and detailed drawings prescribed through the Subdivision Development Principles and Requirements (SDPR) to reduce the variety and ensure the quality of asset types to be maintained by Council.	The SDPR review has commenced.
R3.2	Ensure that the 2021–24 AMP is developed in line with the principles of the Business Case Approach, providing an effective and sustainable strategy for the long-term maintenance of the network, including the correction of any deficiencies in current/ future levels of service.	This will be undertaken as part of the preparation cycle for the 2021–24 Long Term Plan and RLTP processes.
We suggest that Kāpiti Coast District Council:		
S2.1	Consider using the NPV template provided in NZTA's <i>State highway annual plan instructions manual</i> (SM018) for economic analyses of proposed pavement rehabilitation sites.	
S2.2	Review the daily traffic volume threshold for resurfacing carriageways in asphaltic concrete.	
S2.3	Consider increasing condition rating sampling to every 200m with sample size of 40m.	
S4.1	Consider developing a skid resistance policy to identify and address any network skid related safety risks.	
S5.1	Consider flag lighting at appropriate rural intersections.	

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INTRODUCTION

The objective of this audit is to provide assurance that the NZ Transport Agency's investment in Kāpiti Coast District Council's land transport programme is being well managed and delivering value for money. We provide this assurance on the basis of field visits (details of which are attached in Appendix A) and assessment of the following subject areas:

- Previous audit issues
- Network condition and management
- Activity management planning
- Data quality
- Road safety

In reporting on each of the above subject areas we assess whether Kāpiti Coast District Council is appropriately managing risk associated with the Transport Agency's investment. Our rating assessment is based on the audit rating classification definitions summarised in the table below. As part of our assessment we have made recommendations and suggestions for improvement where appropriate.

Assessment Rating	Definition
Effective	<p>Investment management – effective systems, processes and management practices used.</p> <p>Compliance – Transport Agency and legislative requirements met.</p> <p>Findings/deficiencies – opportunities for improvement may be identified for consideration.</p>
Some improvement needed	<p>Investment management – acceptable systems, processes and management practices but opportunities for improvement.</p> <p>Compliance – some omissions with Transport Agency requirements. No known breaches of legislative requirements.</p> <p>Findings/deficiencies – error and omission issues identified which need to be addressed</p>
Major improvement needed	<p>Investment management – systems, processes and management practices require improvement.</p> <p>Compliance – significant breaches of Transport Agency and/or legislative requirements.</p> <p>Findings/deficiencies – issues and/or breaches must be addressed, or on-going Transport Agency funding may be at risk.</p>
Unsatisfactory	<p>Investment management – inadequate systems, processes and management practices.</p> <p>Compliance – multiple and/or serious breaches of Transport Agency or legislative requirements.</p> <p>Findings/deficiencies – systemic and/or serious issues must be urgently addressed, or on-going Transport Agency funding will be at risk.</p>

Prior to this report being approved, Kāpiti Coast District Council was invited to comment on the auditors' findings, recommendations and suggestions. Where appropriate this report has been amended to reflect this dialogue.

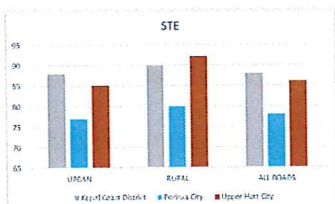
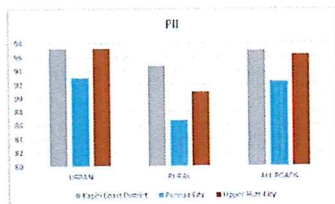
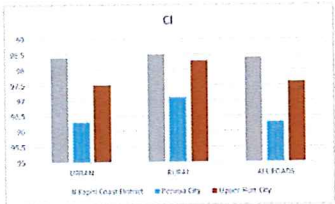
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ASSESSMENT FINDINGS

Our findings relating to each subject area are presented in the tables below. Where necessary, we have included recommendations and/or suggestions.

1. Previous Audit Issues		Effective
<p>The 2009 technical audit (see Appendix C for summary) made five recommendations; four in relation to data and inventory and one regarding rural delineation. Council has made substantial progress in data collection and improvement and have achieved a satisfactory standard in all four areas. Refer to Section 4 <i>Data quality</i> below for more detail.</p> <p>Council has upgraded rural road delineation throughout the network, in accordance with RTS 5 and the <i>Traffic Control Devices</i> manual. They have recently undertaken a night inspection audit and do regular night inspections under the maintenance contract. The audit team found the road marking and delineation devices in the rural area to be of a very good standard, with some minor maintenance and continuity deficiencies.</p>		
Recommendations	No recommendations	

* * *

2. Network condition and management		Effective
<p>Overall network management practice is good. The Access and Transport team is cohesive and well skilled. Effective processes were evident for managing and monitoring the delivery of physical works contracts.</p> <p>Performance Monitoring</p> <p>The physical network is in very good condition as shown by the condition indices of Smooth Travel Exposure, Pavement Integrity and Surface Condition (the graphs below highlight Council's indices compared with regional peer councils of Porirua City and Upper Hutt City).</p> <div style="display: flex; justify-content: space-around;">    </div> <p>The Road Efficiency Group's (REG) reporting tool shows that Smooth Travel Exposure is better than the comparative averages for the peer group for networks <90% urban, the Wellington region and the national road network (based on April 2019 data). Network roughness is also similarly better by comparison. The audit field inspection supported these results.</p> <p>Visual RAMM Condition Rating surveys are carried out annually over the full network based on a sample size set at 50m every 500m. While acceptable, this methodology does not correlate well with the actual condition of the network. Research shows that a high correlation exists between a full network survey and a network sample survey when the sample frequency is every 200m and the sample size is 40m. A 10-year trend analysis report, completed by Opus following the March 2019 rating survey, indicates that pavement faults (rutting and shoving) are generally consistently low and stable and that surface faults (scabbing and flushing) appear to be trending up on Access roads and Arterials when viewed over the longer term. Cracking (alligator, joint and longitudinal & transverse)</p>		

also has a longer term, gradual upward trend across all road classifications. However, all remain within acceptable levels at this time. The audit team did note and commend the extensive use of crack sealing and bandaging to maintain waterproofness of surfacing.

The historic 5-year average renewal rate for chip surfacing is 5.4%, thin asphalt overlays is 3.5% and pavement rehabilitation is 0.2%. The pavement rehabilitation renewal rate is extremely low (comparatively the lowest in its peer group) but is supported by the current good pavement condition, relatively low volume of heavy traffic and Council's pavement analyses. Council develops and manages its resurfacing and pavement rehabilitation forward works programmes (FWP) using Geosolve modelling and Juno Viewer. This includes feeding data such as pavement logs back into the model. In the longer term, this rate will increase significantly and reasonable advance warning of changes to required funding needs to be given through the Activity Management Plan.

Council has a collaborative approach to network management across local authority boundaries and works well with neighbouring councils. Examples are shared service contracts, regular CAR/TMP discussions, combined safety audits, carpooling to regional workshops and sharing its own RAMM/data management expertise.

Compliance

Council follows the planning and investment knowledgebase requirements. Specifically, we noted that:

- Bridge and structural inspections are undertaken in accordance with NZTA S6 *Bridges and other significant highway structures inspection policy*.
- Roughness and condition rating information recorded in RAMM complies with the requirements set in the Agency's Knowledge Base.
- Net present value (NPV) analysis is undertaken for rehabilitation projects, satisfying requirements for Work Category 214 (Sealed Road Pavement Rehabilitation).

Enhancing the NPV calculation

The rehabilitation NPV calculation reviewed was for Raumati Rd (2017/18) – RP (476 to 606). Present Value Cost saving was calculated by comparing "Heavy Maintenance" and "Preferred Option". Cost saving was \$30,482 and it was above the threshold for an Arterial road (\$10,000). NZTA's State highway annual plan instructions manual (SM018) provides an alternative NPV template which gives a more robust economic analysis by introducing EI (Economic Indicator) and TTDC (Travel Time Delay Cost) to the NPV output. Links can be found on <https://www.nzta.govt.nz/roads-and-rail/highways-information-portal/processes/strategic-activity-management/annual-planning/>

NPV is calculated for lowest whole of life cost and to justify the preferred treatment option. The EI output indicates the long-term savings against short term costs and it tests the proposed treatment option is appropriate. The TTDC (Travel Time Delay Cost) allows justification of expensive treatments where they will result in less disruption to motorists. It is suggested that this calculation may add value to Council's NPV outputs.

Surfacing Renewal

Kāpiti Coast has a significant proportion of roads with asphalt surfacing (16.6%) and low traffic volumes (70% of AC is on roads with traffic < 2,000 vpd). Chip seal is a significantly cheaper treatment and can perform as well as asphaltic concrete (AC) in specific circumstances. Council currently may use AC to reseal any streets which have a traffic volume of over 8,000 vpd. This threshold is low when compared to other urban councils. For example, Hamilton City's threshold is 15,000 vpd and Tauranga City and Auckland Transport work to a threshold of 10,000 vpd. It is suggested that Council review the current threshold, considering factors such as the life cycle cost

and risk. A revised threshold would deliver efficiencies to Council and is supported by the audit team. Guidance on engineering decision making and treatment selection is available in *Chipsealing in New Zealand* and NZTA's *Asphalt Surfacing Treatment Selection Guidelines*.

A site report should be completed for each treatment site prior to resurfacing (as per Technical Specifications of the Road Maintenance contract of KCDC (Contract No. C 178)). This should include photos showing the existing condition of the site, pre-seal repairs required, locations of sand circle test done, all the "e" values from sand circle tests, texture data calculations, traffic growth factor, calculation of reseal residual spray rates and the reasons for selecting treatment type/chip sizes for each report.

Recommendations	No recommendations
Suggestions	<p>S2.1 Consider using the NPV template provided in NZTA's <i>State highway annual plan instructions manual</i> (SM018) for economic analyses of proposed pavement rehabilitation sites.</p> <p>S2.2 Review the daily traffic volume threshold for resurfacing carriageways in asphaltic concrete.</p> <p>S2.3 Consider increasing condition rating sampling to every 200m with sample size of 40m.</p>
Kāpiti Coast District Council's comment	<p>Agree with the suggestions.</p> <p>Council validates resurfacing sites to determine suitability and need; the resurfacing contractor is then required to design sites using sand circles, calculating "e" values, texture data, traffic growth, residual spray rates and treatment type/chip size as per requirements under <i>Chipsealing in New Zealand</i> as the contract sits under NZTA P/17. Council then peer reviews the seal designs through an independent Consultant.</p>

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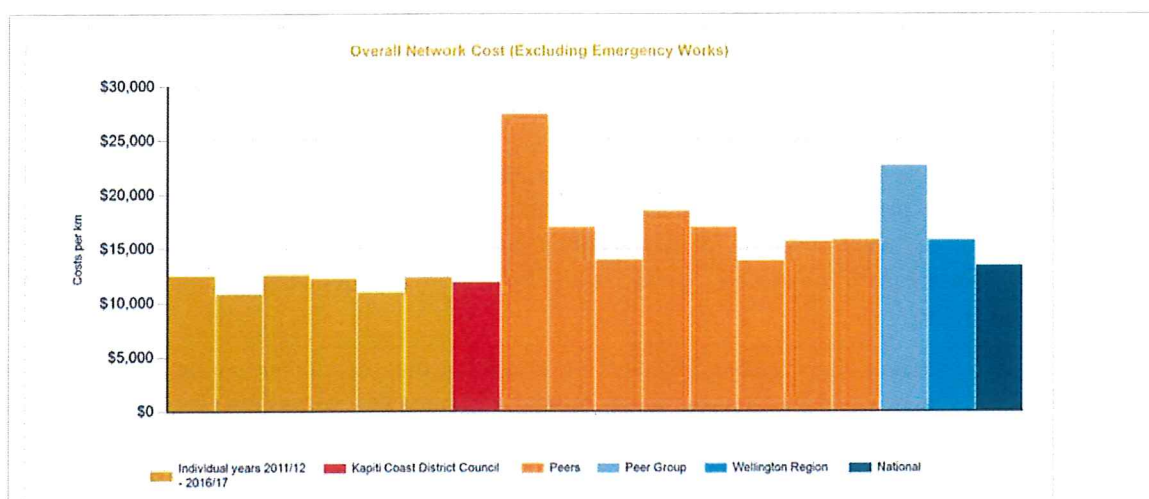
3. Activity management planning

Some Improvement
Needed

Council's 2018–21 Asset Management Plan (AMP) incorporates the programme business case for maintenance, operations and renewals. However, the AMP contains some inaccuracies and inconsistencies and provides marginal solid supportive data / justification for programmes of work.

For the 2021–24 NLTP, NZTA will require that AMPs are developed in line with the principles of the Business Case Approach, achieving a high level of data integrity (including asset inventory, treatment history and condition, cost and traffic data) and defining robust decision-making methods for optimising asset treatments over the network and over time. Council's "on the ground" performance in these areas is considerably ahead of that indicated by the AMP.

Further, the AMP refers several times to under-investment, but provides little factual detail. This will require major rectification for the next NLTP. It is essential that the 2021–24 AMP provides full details of any past under-investment, the consequences to the assets or operation and the effective and sustainable strategy to correct any deficiencies in current/ future level of service. Council's comparatively low investment in the maintenance, operation and renewal of the network (based on cost per km) is highlighted in the graph below.



It is noted that Council, in 2018, commissioned Waugh Infrastructure Management Ltd to review the AMP and Improvement Plan. Waugh's conclusion commenced: *"Overall, our assessment indicates that the AMP assessed shows there is room for improvement"*. Council should continue with this improvement process, as well as fully engaging with any AMP development opportunities offered by NZTA and REG.

It is also important that Council continues to actively manage the revised improvement plan and maintain high quality data to inform management planning.

The Wellington Northern Corridor state highway projects have required considerable input from Council staff; particularly with regard to physical linkages to the local networks, revocation of state highways and changing traffic flows. Residential developments have also accelerated with the improved commuter links to Wellington. Council has responded by employing both a roading clerk of works and a subdivisions clerk of works to actively supervise works, including quality testing and hold point inspections. A comprehensive QA checklist has been developed and circulated for use – along with contract *Inspection and Test Plans* (ITP's), Streetlight Guide, Fact Sheets, HPMV/50 Max routes, forestry operator's standard conditions and standard drawings.

There is a wide variation in some asset types, eg streetlight columns and kerb profiles in new subdivision sites. Council is planning to review the *Subdivision Development Principles and Requirements* (SDPR), including strengthening its linkages to the District Plan and NZS 4404. The inclusion of a comprehensive review, or standalone review, of asset design specifications and detailed drawings will facilitate cost effective maintenance/renewal and ensure best whole of life costs by standardising the asset specifications.

Recommendations	<p>R3.1 Standardise asset specifications and detailed drawings prescribed through the SDPR to reduce the variety and ensure the quality of asset types to be maintained by Council.</p> <p>R3.2 Ensure that the 2021–24 AMP is developed in line with the principles of the Business Case Approach, providing an effective and sustainable strategy for the long-term maintenance of the network, including the correction of any deficiencies in current/ future levels of service.</p>
Kāpiti Coast District Council's comment	Agreed.

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4. Data quality

Effective

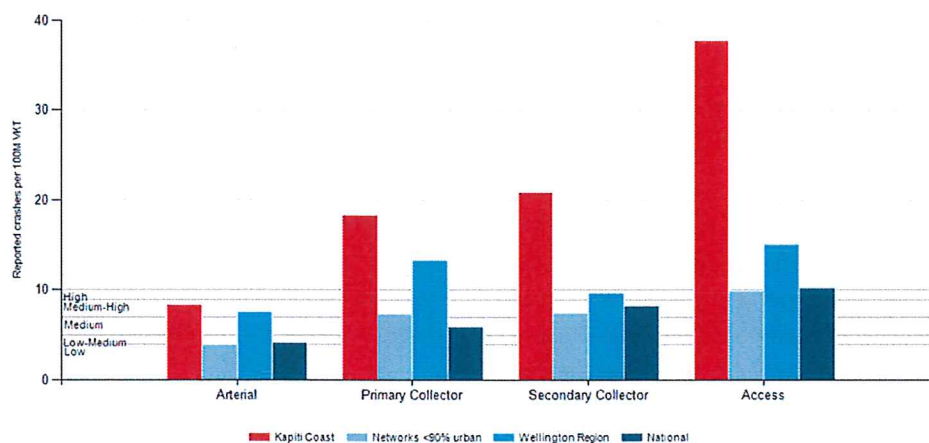
Road Efficiency Group's (REG) 2017/18 data quality report has scored Council with 79/100 (a score of 100 is achieved by having all metric results at the expected standard level), and this has since been revised to 88. The improvement from the 2016/17 score of 34 demonstrates the significant effort Council has put into data management and quality. One notable area of improvement is the completion of inventory audits for sumps, signs, culverts, carparks, service lanes, accessways, walls footpath and kerb & channel etc. Council also have a staff member participating in REG's Data Quality Project.

Data improvement plans are ongoing, and it is important that the momentum be maintained. For example, during the inspection tour it was observed that traffic volume data on some roads was incorrect (particularly in recently developed subdivisions).

Council does not currently undertake SCRIM (Sideways Force Coefficient Routine Investigation Machine) testing on the network. Skid resistance is primarily a function of the surfacing aggregate microtexture and macrotexture. It is lower when the road surface is wet. Other factors that influence skid resistance include surface contamination, vehicle tyres (in particular the polishing action of heavy vehicle tyres), vehicle suspension and hysteresis of vehicle tyre rubber. The surface contaminants with the greatest effect on skid resistance are bitumen, oil, grease, tyre rubber, mud, clay and organic (plant) matter. Appropriate skid resistance reduces crash rates and is a very economic, crash reduction tool. The One Network Road Classification (ONRC) performance measures reporting tool (PMRT) indicates a high personal safety risk on Kāpiti Coast rural roads (refer to graph below), which may have a loss of control component potentially related to skid resistance.



The total number of reported crashes by traffic volume over the past 10 years on the network



The cost of using SCRIM is understood to be a deterrent and Council would like to see a national initiative in this field. Nevertheless, the audit team feel that it would be of value for Council to investigate the benefits to the Kāpiti Coast network with regard to measuring skid resistance and develop a skid resistance policy. This may identify higher risk roads/sites/situations for regular survey. Alternative equipment to SCRIM which might be considered include:

- GripTester
- Norsemeter Road Analyser Recorder (ROAR)
- British Pendulum
- Pavement Friction Tester
- Vericom and similar accelerometers in vehicles
- Dynamic Friction Tester.

Recommendations	No recommendations
Suggestions	S4.1 Consider developing a skid resistance policy to identify and address any network skid related safety risks.
Kāpiti Coast District Council's comment	Agreed.

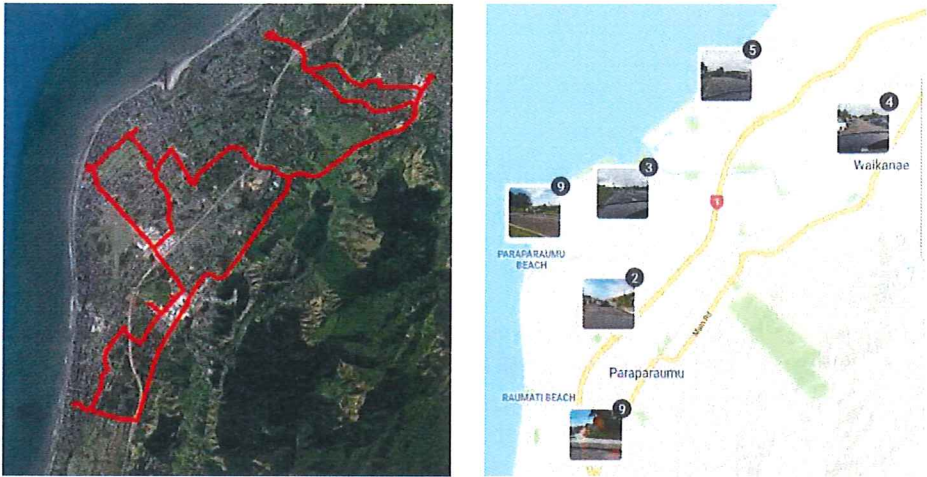
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5. Road safety	Effective
<p><u>Performance Monitoring</u></p> <p>The number of annual deaths and serious injuries on Kāpiti Coast's roads is not high comparatively, but is trending up and, according to the ONRC PMRT, at a faster rate than peer councils.</p> <p>The 2017 Communities at Risk Register ranked Council as a high concern for crashes involving pedestrians (2nd worst in country) and medium concern for crashes involving cyclists (3rd worst). Council has addressed these at-risk groups by pursuing a high standard of safety in the development of their comprehensive Stride and Ride cycle network. Vulnerable road users are also specifically targeted in road safety promotions programme. The 2018 Communities at Risk Register ranks Council in the green on every risk criteria.</p> <p>The safety team have also:</p> <ul style="list-style-type: none"> • developed a comprehensive speed management plan for the district • provided support at Police Checkpoints for alcohol, speed and child restraints • run events providing and fitting free anchor bolts for child restraints • begun developing a strategy around cycle lane markings • run e-bike and mobility scooter courses for older users • managed Road Safety Advisory Groups with community participation. <p>Safety improvement projects completed under the Low Cost Low Risk (LCLR) funding category are also effectively addressing existing safety issues (such as Arnold Grove carriageway widening) and are proactively managing risk (eg Emergency rail crossing).</p> <p><u>Road Safety Audits</u></p> <p>Council carries out Road Safety Audits for all renewal and improvement projects. Audit reports were requested and viewed for Poplar Avenue shared use path (post construction) and Ratanui Road/Mazengarb Road roundabout (concept design).</p> <p><u>Flag Lighting</u></p> <p>Drilling down into the ONRC PMRT safety outcomes for personal and collective risk highlights that rural roads are the primary cause of the high numbers. A background report shows that of the eight DSI crashes over the period 2012/13 – 2017/18, six were at night or in dark or twilight conditions. It is not known if these were located at intersections, but flag lighting was not observed on the rural roads. Studies in New Zealand do indicate that flag lighting in the right place can be a cost-effective crash counter measure.</p>	
Recommendations	No recommendations
Suggestions	S5.1 Consider flag lighting at appropriate rural intersections.
Kāpiti Coast District Council's comment	Agreed.

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APPENDIX A

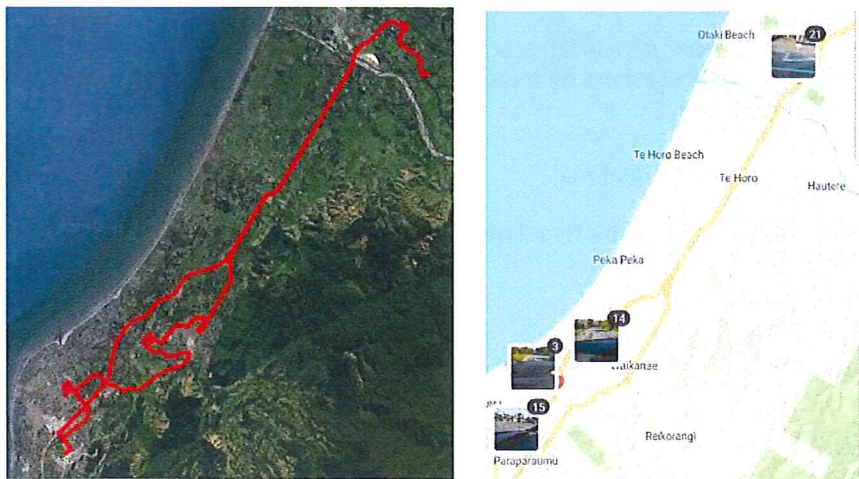
Field Visit Route – Day 1



Audit Field Visit Route – Day 2



Audit Field Visit Route – Day 3



APPENDIX B

Sample of Audit Photos



APPENDIX C

Previous Technical Audit Report (April 2009 Audit) Extract

Recommendations

We recommend that Council:

- a. Ensure that traffic count and classification data is collected in a strategic manner
- b. Validate asset data e.g. seal age profile, traffic counts and culverts and ensure data is accurate and timely
- c. Input maintenance cost data into RAMM to assist with reporting
- d. Ensure all structures are included in the RAMM inventory
- e. Ensure rural delineation standards are complied with.

Suggestions

We suggest that Council:

- a. Adopt a policy for retaining walls that addresses ownership and maintenance requirements for these structures
- b. Reviews street name blade signage so as to comply with Road and Traffic series 2
- c. Investigate the provision of advanced direction signage on arterial roads
- d. Ensure that new subdivision and resource consent applications meet approved roading standards with roading staff included in the approval process.

Technical Audit Report Quality Assurance

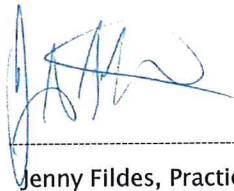
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Prepared by:



Dawn Shannon, Senior Investment Auditor

Approved by:



Jenny Fildes, Practice Manager Audit & Assurance

