Appendix 'W'

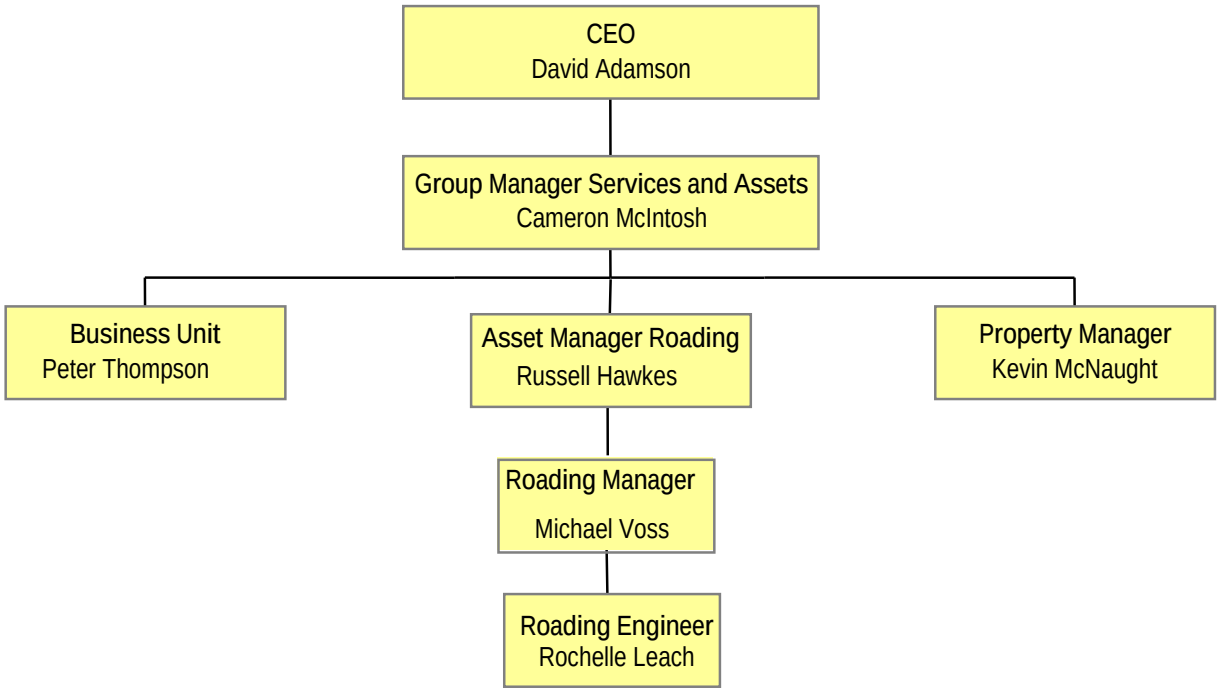
An Overview of the Activity's Organisational Structure, Management Practices, Data Systems, Decision-Making Processes and Human Resources

Initial Performance Measures
Developed
More to be Provided

1. Organisational Structure

The manner in which the Council delivers its land transport services, and the roles and responsibilities of the various parties, is described in Appendix 'Y'.

The organisational structure is shown below.



2. Accounting / Financial Systems

The Council accounts for revenue and expenditure on an accrual basis.

The accounting package is based on the GEAC System and JD Edwards.

All work under the Works Programme is identified through a Works Order system, which provides a significant level of breakdown to subcategories necessary for management and reporting. The costs are summarised into the general ledger, where maintenance costs are identified separately to capital and renewal items.

Specialist reports have been developed to match analysis code costs to the work categories required by NZTA.

All contract works (see Appendix 'Y') are claimed monthly against each of the contract item numbers by the physical works and consultant contractors (this includes external and internal consultants). The consultant confirms the payment value for all physical works, and the SDC confirms the payment for the consultancy

services. The accounts job number and accounts codes are included on the payment certificate. These certificates are forwarded to SDC for actioning, including payment.

The types of work that this system relates to are maintenance, renewals and new work expenditure.

There are a range of reports prepared in order to comply with the requirements of management, NZTA and the Council's auditors. All external reports are prepared in compliance with GAAP.

3. The Asset Management Systems

There are several systems which provide data to assist with the decision-making process to do with the roading network.

RAMM (Road Asset Maintenance Management) is a relational database, which is the main system that is used to provide a full description of all the variables of every section of road that makes up the roading network. This has been linked to GIS to provide a visual display of data. The following are the data descriptions:

RAMM Tables	Description	Completeness	Accuracy
Road Names	Road Name and number	99%	99%
Carriageway	Road section lengths and widths	95%	95%
Traffic	Traffic counts and estimates	50%	90%
Loading	Vehicle mix percentages	30%	70%
Surface Water Channels	Lengths, Types & dates	95%	80%
Shoulders	Lengths, types & dates	90%	90%
Footpath Inventory	Lengths, location, etc	99%	95%
Footpath Top Surface	Lengths, types, dates etc	99%	95%
Footpath Rating	Location, condition, etc	90%	80%
Berms	Location, types etc	10%	50%
Vehicle Crossing	Location, types, etc	10%	50%
Pavement Surfacing	Lengths, types & dates	99%	99%
Pavement Structure	Lengths, depths & dates	95%	80%
Drainage	Culvert location, type, size, etc	20%	80%
Signs	Location, type, dates etc	99%	99%
Markings	Location, type, length etc	80%	90%
Railings	Location, length, types etc	70%	90%
Road Roughness	Location, dates, NASSRA	99%	99%
Road Rating	Location, condition, etc	99%	99%
Features	Location, length, etc	50%	90%
Retaining Walls	Location, type, dates etc	60%	95%
Maintenance Cost	Quantities and cost	80%	90%
Falling Weight Deflectometer	Location, deflection, SNP	90%	95%
High Speed Data			
- Roughness*	Location, roughness	99%	95%
- Texture*	Location, texture	99%	80%
- Rutting*	Location, rutting	99%	90%
- Geometry*	Location, gradient, radius	99%	95%
Bridge and Bridge Culverts	Location, bridge details	99%	90%
Road Dimension	Location, width	80%	95%

* The high speed data is relatively new and requires time to verify the accuracy.

The database was established in 1991. During its establishment a large number of assumptions were made to 'stock' it and with time this will improve. Since then, the details of maintenance works including pavement rehabilitations, seal widening and reseals have been added. The inclusion of general maintenance items only commenced in 2000. The previous list of all the data descriptions has their reliability and adequacy included. The RAMM software is managed by CJN Technology Ltd and is accessed via an Internet link. MWH manage the maintenance and updating of the database.

Traffic Counts are essential to define the level of service required and to predict future deterioration of the network. Aligned to this is the traffic mix and the loadings for heavy commercial vehicles. Collection of this data is carried out continuously with counters being changed weekly. The traffic counting strategy is currently under review. This information is held in the RAMM database.

The FWD (Falling Weight Deflectometer) is a method to determine the structural strength of pavements. This is used generally on sealed roads and has two levels of output. The first level of analysis is the Network level. This is used to give an overview of the pavement strength along the higher demand group roads. The second level provides more detail and is used for the designing of pavement rehabilitations, seal widenings and seal extensions. This data requires field testing to ensure that the assumed pavement data is correct and actual traffic volumes and percentage of heavy vehicles are accurate to provide reliable output. A yearly programme is developed. This data is stored in electronic form on the network consultant's computer system and is available in RAMM. In 2008 a programme of FWD testing was carried out which resulted in the full sealed network being covered by FWD testing.

SCRIM (Sideways Force Coefficient Routine Investigation Machine) is a process of testing for skid resistance levels and whether they are acceptable within the network. This work in the past has targeted selected areas and was intermittently carried out. This data is stored in RAMM. In 2008 a contract was let to collect SCRIM data across the whole sealed network. Unfortunately, due to a number of issues, the company carrying out this work are still to complete it at April 2009.

In the past a "cheap" testing method of skid resistance has been used to test most of the sealed network. This involved using a 'Grip Tester'. The results of this were only marginally useful to determine priorities for remedial work on skid deficient areas.

The bridge database is the main system that is used to provide a full description of all the variables of every bridge. Bridges receive 'Engineering' inspections on a 6 yearly cycle and the worst condition bridges are inspected bi-annually. This data is interrogated to determine bridge maintenance/renewal requirements. RAMM has been enhanced and now holds all of the bridge data.

The data collected by these systems is used to make decisions on future programmes. There is also a computer based system called dTIMS (deightons Total Infrastructure Management) which is a modelling system using algorithms to predict pavement behaviour and wear patterns to determine appropriate responses. This system uses RAMM database information and pavement condition rating data to predict pavement and surfacing performance. The modelling system is being gradually enhanced as better information is collected and the model is further developed. Refer to Appendix F for details of what is hoped to be achieved with the model in terms of future projections at a later date.

All road sections are monitored by the physical works contractor to determine the maintenance needs to ensure that the road network is kept at or above the minimum levels of service required by their contracts. The Area Engineers also monitor the roading network condition as part of verifying contractual claims but also while dealing with query issues relating to road user or adjacent property owner enquiry. This is necessary as the thinner pavements are sensitive to additional heavy traffic that can occur as an isolated pattern.

Table W.1 summarises the 'systems' situation.

Table W.1 Summary of Asset Management Systems

Systems	Format	Data Collection Process	Stored
RAMM	Database	Ongoing updating and two yearly (usually) representative sample of conditions.	CJN Technology Ltd, access via the internet
Bridging Database	Part of RAMM Database	Ongoing updating and six yearly major inspections.	MWH and loaded into RAMM on completion
FWD	Spreadsheet	Full network completed 2008.	MWH and is stored in RAMM
SCRIM	Spreadsheet / GIS	To be collected on full network in 2008.	Held in RAMM
dTIMS	Database	Run using RAMM data.	Held by MWH
High Speed Data Collection	Video/Database	To be collected on full network in 2008.	Video hard drive and in RAMM
Crash Data	Database	Three monthly update.	Held by LTNZ (now NZTA)
Traffic Counts	Database	Continuously.	Held in RAMM

4. Information Flow Requirements and Processes

General maintenance work is continuous throughout the year and responds to the needs of the network. The data from the repairs carried out is fed into RAMM on a regular basis. This process operates with the data being formatted by the contractors to smoothly interface with the RAMM database. Traffic counts are fed into the RAMM database each week that the data is collected. RAMM rating is carried out two yearly in winter, although the last rating had a gap of three years to coincide with the overall collection of High Speed Data (HSD).

The initial planning work for the physical works programme involves the preparation of the information required for the application for funding to NZTA. From the RAMM rating and maintenance inputs the initial reseal and pavement rehabilitation programmes are determined. At this stage a ten year programme is also produced and this is compared to the output from dTIMS. The output from the yearly programme is discussed with the Area Engineers and also inspected on site and confirmed as being required. There is usually additional work included in these programmes. The pavement rehabilitations are analysed through the NZTA simplified procedures and the net present values determined and all projects ranked. The NZTA procedure determines whether reconstruction is cheaper than maintenance. At this stage the bridge renewal programme, minor safety programme and crash data for each site are checked so that projects in the same area can be programmed to coincide or combined into contract packages. Pavement rehabilitations are also grouped to provide a mix of contract sizes to achieve economies of scale to attract competitive pricing.

The programme is checked to ensure that FWD data is available at the design level and a programme to include future work from the 10 years programme is included to make up the FWD testing programme.

When the various works are complete the fields within RAMM are updated to include the changes.

Formal ranking of projects is based on either benefit cost ratios or net present values and depends on the funding mechanism used.

In future all programmes will go through the Regional Transport Committee (RTC) for sign off. All maintenance and renewal activities put forward by a TLA will be passed on directly to NZTA to seek funding for a 3 year programme. Only new construction projects which are justified on the basis of benefits and costs need to be prioritised through the RTC.

Bridge replacement/renewals are based on benefit cost analysis if they exceed $200,000 in value. All bridge projects are ranked on their merit. Other smaller bridges are replaced based on their priority and whether they meet NZTA's Bulk Funding criteria.

Pavement rehabilitation treatments are based on net present value of the construction cost compared to the maintenance cost, with the option with the highest net present value used. With low traffic volumes and roughness values there is insufficient benefit/cost to proceed with pavement works from a benefit/cost analysis. All projects are ranked on their merit.

Minor improvement projects are carried out at areas in conjunction with pavement rehabilitation's and also based on crash records. Larger projects are selected on benefit/cost analysis.

Reseals are checked against age and condition.

Each year when the annual programme is developed, the results from the previous year's final outcomes are compared to what was predicted to happen and if there are differences then the prediction model is reset to the latest information. Each year all rates are rechecked and altered to the current season's contract prices. If the methodology of work practices changes then the algorithms are also altered to reflect this.

The total funds required are based on the current requirements identified and the previous year's expenditure. During the season there is the ability to reallocate funds depending on priorities. This reallocation also depends on initial contract prices and changes to the contracting market with the final mix being altered to provide the best final outcome for the long term benefit of the network. RAMM and dTIMS are the systems that will be relied on in the future to ensure that the correct mix of works keeps the balance within the network. Experienced roading practitioners are also able to tell when the mix is out of balance with the needs of the network. Area Engineers are also able to put in place holding works, which allow some projects to be held over into the new funding year to help balance budgets.

Lifecycle costs are analysed at the design phase of all projects to the criteria laid out by NZTA. Standard design charts are used in performance prediction at this stage as these are recognised nationally and internationally and backed by long term research.

5. Standards and Guidelines

The management of the roading asset is determined by the available funding to maintain the networks as a viable entity. The requirements of NZTA (which provides the bulk of the roading funding), are detailed in a

Standards and Guidelines Manual. The two key manuals that are detailed in this manual are the Planning, Programme and Funding Manual and the Economic Evaluation Manual.

Another key manual is the International Infrastructure Management Manual which provides the structure and format for Asset Management Plans.

6. Human Resources

Resources are predominantly outsourced through two key areas. Professional services are contracted from MWH New Zealand Ltd for activities generally associated with:

- Annual programming and associated data analysis.
- Inventory and condition data collection and management.
- Renewals scoping, surveying, designing and contracting including contract management (pavement rehabilitation and reseals).
- Structural design and contracting.

The Council's in-house business unit, Area Engineers, provide day-to-day network management including servicing Community Boards and CDAs. They manage the maintenance contracts.

The only direct employees of the Council managing the activity are the Asset Manager Roading, Roading Manager and the Roading Engineer. These staff keep up-to-date with regular attendance at courses, meetings with their peers, working closely on projects with their contractors and consultants to jointly achieve innovative solutions. An example is the current resealing contracts which require the contractor to come up with a resurfacing solution for each road section which they can demonstrate will provide the lowest lifetime cost over a 25 year time horizon. This ensures decisions are made based on overall Life Cycle Management principles rather than short term affordability criteria.

7. Benchmarking

Each year NZTA produce a number of comparisons of roading expenditure and achievement by all local authorities in New Zealand. A separate project comparing the results of RCA forum benchmarking is being carried out. Only preliminary results of this are available at this stage. These have been included in Attachment A. Because of this, the remaining comparisons for Southland versus other Councils in its peer group (i.e. Councils with less than 50% of their network sealed and less than 20% of network urban) have not been included in this Plan.

As with all statistics and comparisons care will need to be taken with how the information is used and interpreted. The comparisons are dependant on how each Council splits and reports its expenditure, where the Councils are in the long term life cycles of their networks, what Levels of Service are being provided, priorities for the network, traffic volumes, average widths of roads, proportions of sealed and unsealed roads, climatic conditions, subsoil conditions, roading material availability, contractor competition, etc.

Comparisons involving expenditure versus VKT (vehicle kilometres travelled) are not as good due to the large size of SDC's network and the generally low traffic volumes. Generally the cost per VKT goes down as the traffic volume goes up as costs incurred in maintaining roads are dependant on not only traffic but also time and climatic factors, i.e. bitumen breaks down under UV light over time and grass grows on shoulders irrespective of traffic.

8. NZTA Reviews

Southland District Council work closely with NZTA to achieve the best outcomes possible for the road users and rate payers, within available funding constraints. To help with this NZTA provide feedback on various aspects of road management and maintenance through technical and safety audits. As the results of these audits are provided, Council considers them and seeks to make changes which can enhance the management, maintenance and safety of the network.

A recent example has been the RISA (Road Infrastructure Safety Assessment) undertaken in mid 2008. As a result of this Council will be reviewing how it can implement the recommendations as soon as possible with many already incorporated into this Plan. The biggest change as a result of the RISA is the move away from standard marked 3m traffic lane widths on sealed roads to widths of up to 3.5m on roads wide enough to handle this width. The details of the transition to this marking philosophy are being worked through.

Since the RISA was carried out a Technical Audit by NZTA has also been carried out. This did not highlight the same issues as the RISA and in fact disagreed with some of the RISA findings. The final report of the Technical Audit is still to be provided. Once this is received decisions on how far to take the above will be made.

9. Issues

Road Asset Information

- Complete collation of SCRIM data.
- Complete and maintain the link between Council's GIS system and RAMM.
- Update and improve RAMM inventory to include:
  - Culverts, sumps and soakpits, etc.
  - Accurate age profile of the asset.
  - Improve inventory of road markings, edge marker posts and RRPM's.
  - Footpath age and increased accuracy.
- Develop database of street lighting.
- Review need to further rationalise some roads between road groups reflecting what is now possible using better traffic data and GIS.

Understanding Demands on the Network

- Systems need to be developed to improve Council's ability to plan responses to changes in demand such as occurs from the forestry and dairy industries.
- The current traffic counting programme is being reviewed to ensure that Council is receiving sufficient, appropriate and timely information on which to base its planning.

Information Management System

- Consideration should be given to developing a computer operating system that brings together all the current databases into a comprehensive and encompassing system. (It is quite likely that the majority of existing databases can be retained). Databases and systems would include:
  - RAMM
  - Maintenance Cost Information
  - Asset Valuations
  - Street lights
  - Signs
  - Long-term planning
  - Crash data
  - Road condition information
  - Road video records
  - Bridge overweight information

Performance Monitoring

- Identification and documentation of procedures for reporting annual performance.
- Develop full level of service document which spells out all the levels of service / response times that SDC's customers can expect.

Additional Inventory Requirements

- Retaining structures – complete gathering of data to formulate register and assess condition.
- Unformed roads – identify and prepare inventory and develop strategy for managing or disposing.
- Guard rails and hand rails – ensure all are loaded into RAMM and any deficiency database where required.
- Threshold treatments – ensure these are identified and loaded into RAMM.

Pavement Performance

- Use the improvements of dTIMs to help optimise expenditure. The outcomes from the pavement deterioration modelling will impact on many pavement management aspects, including:
  - Maintenance strategies.
  - Asset valuation.
  - Life cycle management.
  - Financial forecasts.

Maintenance Intervention Strategy

- Complete implementation of MIS to clearly define the method for planning and programming maintenance activities based on current best practice. Include long term programmes for reference.

Measurement of Levels of Service

- Put in place a monitoring and reporting regime to enable actual results to be promptly reported to management throughout the year, and publicly at the end of each year.

Correlation Between Maintenance Outcomes and Customer Satisfaction

- Work needs to be carried out to determine the degree of correlation between the achievement of agreed levels of service by the maintenance contractors, and the levels of customer satisfaction achieved.

Policy and Standards Issues

- It is recommended that Council reconsider / confirm the items outlined below:
    - Streetlighting standards for different demands.
    - Delineation. Dedicated funding for programming and replacement of EMP's and RRPM's.
    - Further develop issues relating to risk to cover management of individual risk items.
    - Complete the staged implementation of controlling all uncontrolled intersections.
    - Providing rapid number blades on road sign names blades at T-intersections.
    - Application of extent of Network Policy.

10. Future Action and Improvements

Schedule
Future Improvement Priorities

Ref. No.	Item	Appendix Relative Urgency						Comments
		1	2	3	4	5	6	
W1	Complete collation of SCRIM data				✓			Superseded by SCRIM data.
W2	Complete and maintain the link between Council's GIS system and RAMM					✓		In progress.
W3	Update and improve RAMM inventory to include: - Culverts, sumps and soakpits, etc - Accurate age profile of the asset - Improve inventory of road markings, edge marker posts and RRPM's - Footpath age and increased accuracy					✓		Items in progress or under action through other improvement actions in Plan.
W4	Develop database of street lighting					✓		Refer to F23.
W5	Review need to further rationalise some roads between road groups reflecting what is now possible using better traffic data and GIS					✓		Do as part of Strategic Network Plan. Refer to R22.
W6	Systems need to be developed to improve Council's ability to plan responses to changes in demand such as occurs from the forestry and dairy industries					✓		Longer term. In progress.
W7	The current traffic counting programme is being reviewed to ensure that Council is receiving sufficient, appropriate and timely information on which to base its planning					✓		To complete.
W8	Consideration should be given to developing a computer operating system that brings together all the current databases into a comprehensive and encompassing system					✓		Looking at options. Much of information is consolidated in to RAMM.
W9	Identification and documentation of procedures for reporting annual performance					✓		Carryout alongside U2.
W10	Develop full level of service document which spells out all the levels of service / response times that SDC's customers can expect					✓		In progress.

W11	Retaining structures – complete gathering of data to formulate register and assess condition					✓		Refer C2.
W12	Unformed roads – identify and prepare inventory and develop strategy for managing or disposing					✓		Long term. Develop for 2012 LTCCP.
W13	Use the improvements of dTIMs to help optimise expenditure. The outcomes from the pavement deterioration modelling will impact on many pavement management aspects					✓		In progress. To further refine.
W14	Complete implementation of MIS to clearly define the method for planning and programming maintenance activities based on current best practice. Include long term programmes for reference					✓		In progress. To complete.
W15	Put in place a monitoring and reporting regime to enable actual results to be promptly reported to management throughout the year, and publicly at the end of each year					✓		Refer U2.
W16	Work needs to be carried out to determine the degree of correlation between the achievement of agreed levels of service by the maintenance contractors, and the levels of customer satisfaction achieved					✓		Still to start.
W17	It is recommended that Council reconsider / confirm the items outlined below: - Streetlighting standards for different demands. - Delineation. Dedicated funding for programming and replacement of EMP's and RRPM's. - Further develop issues relating to risk to cover management of individual risk items. - Complete the staged implementation of controlling all uncontrolled intersections. - Providing rapid number blades on road sign names blades at T-intersections. - Application of extent of Network Policy					✓		All these issues covered elsewhere in more detail in this Plan.
W18	Guardrails and Handrails – ensure all are loaded into RAMM and any deficiency database where required					✓		Refer X17.
W19	Threshold Treatments – ensure these are identified and loaded into RAMM					✓		In progress.

W20	Develop a decision making flow chart or a wiring diagram of the decision making process for establishment of physical works programmes for each major area of expenditure within the network, especially those of particular interest to NZTA						✓	Look at for 2012 Plan.

Key:

1 = Extremely urgent (needs to be addressed now)
2 = Very urgent
3 = Urgent
4 = Reasonably or fairly urgent
5 = Not urgent
6 = A good idea for some time in the future

Attachment 'A'

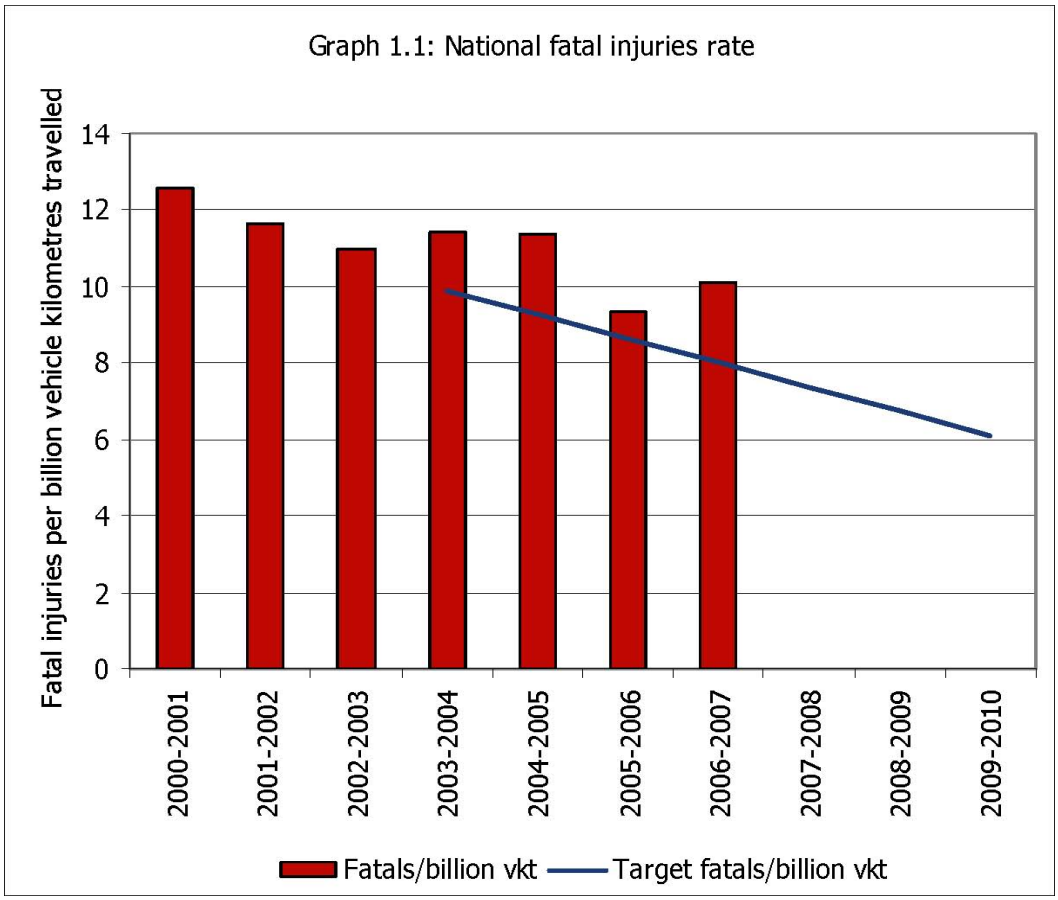
Local Authority Comparisons

Asset Performance Monitoring

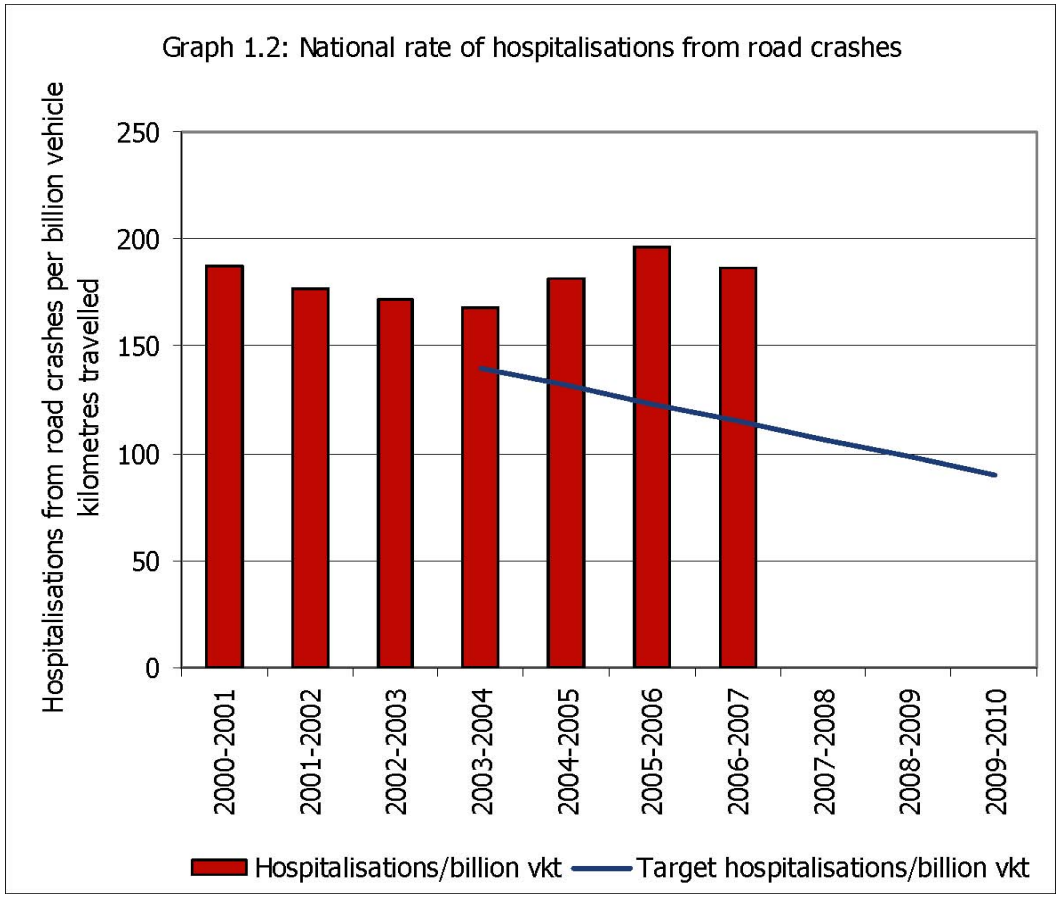
Report to RCA Forum

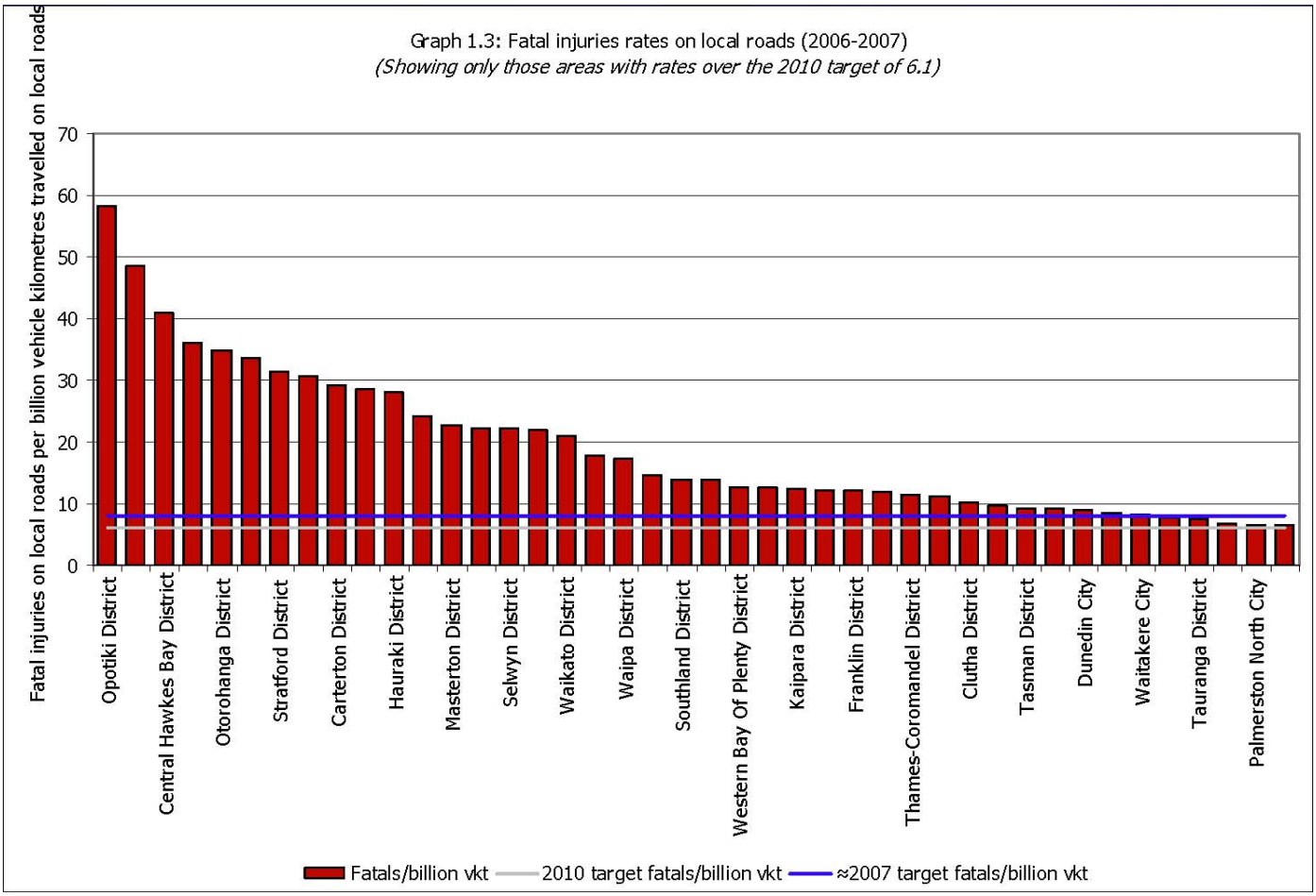
5 December 2008

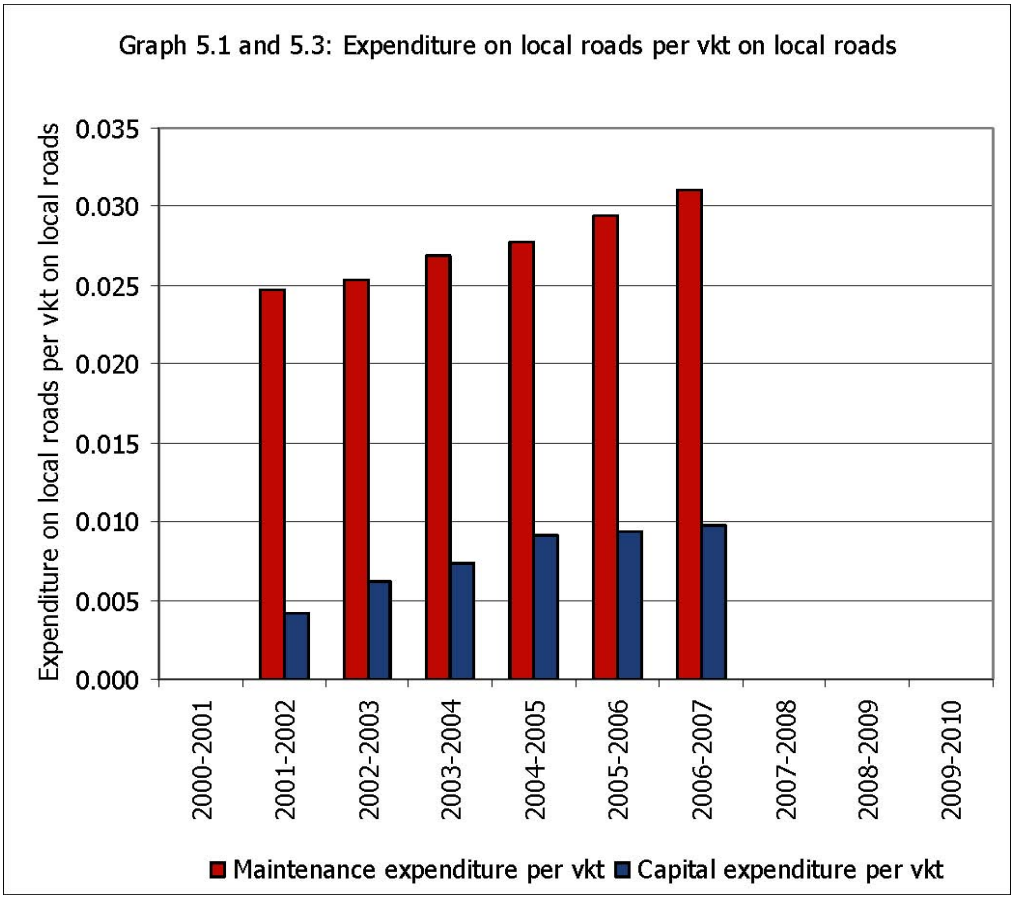
Graph 1.1: National fatal injuries rate

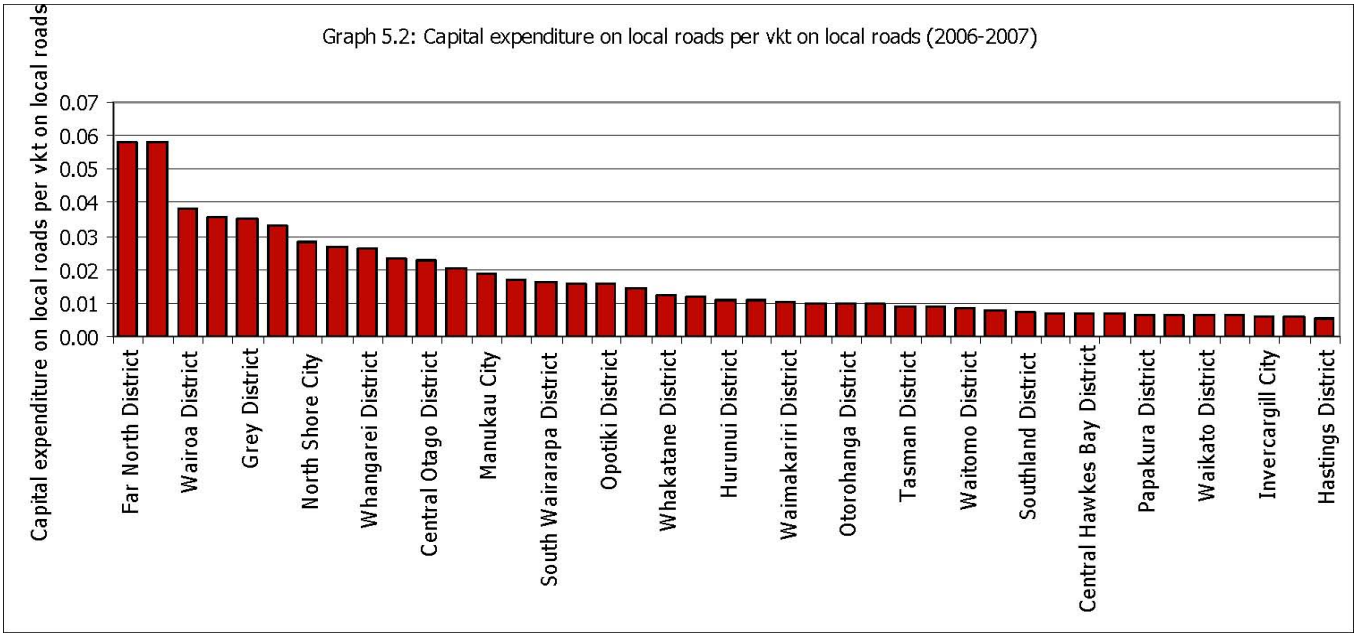


Graph 1.2: National rate of hospitalisations from road crashes




Graph 1.3: Fatal injuries rates on local roads (2006-2007)
(Showing only those areas with rates over the 2010 target of 6.1)
Fatal injuries on local roads per billion vehicle kilometres travelled on local roads
70
60
50
40
30
20
10
0
Opotiki District
Central Hawkes Bay District
Otorohanga District
Stratford District
Carterton District
Hauraki District
Masterton District
Selwyn District
Waikato District
Waipa District
Southland District
Western Bay Of Plenty District
Kaipara District
Franklin District
Thames-Coromandel District
Clutha District
Tasman District
Dunedin City
Waitakere City
Tauranga District
Palmerston North City
Fatals/billion vkt
2010 target fatals/billion vkt
≈2007 target fatals/billion vkt


Graph 5.1 and 5.3: Expenditure on local roads per vkt on local roads
Expenditure on local roads per vkt on local roads
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
2000-2001
2001-2002
2002-2003
2003-2004
2004-2005
2005-2006
2006-2007
2007-2008
2008-2009
2009-2010
Maintenance expenditure per vkt
Capital expenditure per vkt


Graph 5.2: Capital expenditure on local roads per vkt on local roads (2006-2007)
Capital expenditure on local roads per vkt on local roads
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
Far North District
Wairoa District
Grey District
North Shore City
Whangarei District
Central Otago District
Manukau City
South Wairarapa District
Opotiki District
Whakatane District
Hurunui District
Waimakariri District
Otorohanga District
Tasman District
Waitomo District
Southland District
Central Hawkes Bay District
Papakura District
Waikato District
Invercargill City
Hastings District