

REG | THE ROAD EFFICIENCY GROUP

BEST PRACTICE AMP WORKING GROUP

Case Study

Implementation of the RIMS Traffic Counting Guideline

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Version No	Date	Item Affected	Description of Change
1	6/11/13		Draft Document Created
2	13/2/14		Final

Executive Summary

Central Otago District Council has been tasked with implementing the RIMS Traffic Counting Guideline and providing feedback to the AMP Group regarding the readiness of this guideline to be carried over the line to wider industry uptake.

The RIMS guideline seeks to achieve a change in traffic counting practises away from reactive counting and relying on local knowledge, to a proactive strategically planned programme which will automatically update AADT estimates and incorporate variations in seasonal traffic volumes and traffic growth across TLA areas.

The proposal is to create a bottom up process that seeks to provide RCAs with the knowledge, tools and systems to improve their local traffic monitoring .

If implemented the process will provide both the RCA's and external organisations who use this information more robust road traffic data.

In order to succeed in providing data that is useful to external agencies wide uptake is required across New Zealand. The RCAs will need to be convinced that the value to them of implementing this process is sufficient to outweigh the cost and resource input required to implement it.

The Central Otago District experience of using the RIMS Guideline and implementing the RAMM Traffic Counting Module is that this is a relatively difficult process to set up for users who have a moderate level of understanding of RAMM and traffic counting. There is a risk that if RCA's who do not have advanced RAMM users in house try to apply this process then they may abandon it part way through.

If the process is to be implemented successfully across New Zealand, then a greater level of support will be required. This could take the form of a more detailed guideline from RIMS, training, and setting up a support network of Councils who have experience in applying the process.

While RAMM Ltd can provide training on how to populate the module, it would be beneficial if the training was done in partnership with RIMS who are better able to provide input as to appropriate choices around the variables for different types of networks.

Alternatively, RCAs may consider that as the set-up of this module is a one-off exercise then it would be more efficient to engage a Consultant who has experience in this area. If a Consultant undertakes this work then it will be important to ensure the Consultant is briefed appropriately to ensure that local knowledge held within the RCA is incorporated into the process.

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1 Introduction

1.1 Project Outline

Project Name:	
Project Location:	Central Otago District
Project Objectives:	To apply the RIMS Traffic Counting Guideline and provide feedback to the BP AMP Group regarding the readiness of this guideline to be carried over the line to wider industry uptake.
Length:	
Traffic Volume:	
Supplier(s):	Internal
Project Stage:	
Value: (cost savings)	
Scope of Work:	
Environment:	
Constraints:	
Project commenced:	
Key Issues:	

1.2 Project Team

Name	Organisation / Role	Contact Details (Email and Telephone)
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2 Case study

2.1 Introduction

Central Otago District Council has been tasked with implementing the RIMS traffic counting guideline and providing feedback to the AMP Group regarding the readiness of this guideline to be carried over the line to wider industry uptake.

The RIMS Traffic Counting Guideline is a 12 page document which was released in May 2013. The guideline recommends use of the RAMM Traffic Counting module and provides a brief overview how the module works.

The Guideline outlines the following

- The background and rationale for change to current practise.
- The reasons, objectives and principles for collecting traffic data
- the reason for development of the RAMM Traffic Counting Module
- An overview of the RAMM Traffic counting module, which includes the following:
 - The concept of traffic links, and how these can be created
 - Improved targeting of count programmes by introducing a cyclic counting regime
 - Improving converting short duration ADT to estimated AADT by using different traffic profiles
 - Improving the application of traffic growth rates across different parts of the network
 - Improving estimates on uncounted road sections by associating to count sites on other road sections as a ratio.

Implementation of the RAMM Traffic Counting Module has been undertaken by Julie Muir and Mick Sparrow from Central Otago District Council. The discussion and recommendations with this report are therefore based on the experience of users who have a broad understanding of RAMM, but are not considered to be advanced users.

2.2 Background and Rationale for Change

The guideline states that the currency, quality and completeness of the traffic information contained in TLA databases is extremely variable, and generally poor overall, and that the traffic count data available is unlikely to meet planning and policy needs.

It identifies that this is not a new problem and there have been several attempts to create a national traffic monitoring system to meet the needs of agencies for a range of purposes. Previous attempts have been centrally driven.

The proposal is to create a bottom up process that seeks to provide RCAs with the knowledge, tools and systems to improve their local traffic monitoring. In doing so the project seeks to:

- not place undue pressures on the limited staff and financial resources of the RCAs.
- provide recognisable efficiency benefits to those using the system.

Discussion

These sections of the guideline are easy to follow and identify a need for improvements to current practise in order to improve the basis for a national traffic monitoring system as well as network performance monitoring and benchmarking.

It focusses on the need for this work more from a national perspective, than from a local perspective.

Recommendation - Uptake by the majority of RCA's is required if this method is to achieve the desired objectives.

2.3 The Reasons, Objectives And Principles For Collecting Traffic Data

This section focuses more on the need for this work from a RCA perspective.

Two principal reasons are identified for RCA's to have accurate estimates of traffic volumes:

Funding

NZTA Planning and Investment Group have auditors to check the accuracy of information provided to support funding applications

Better Decision Making

More accurate information leads to more robust analysis and confidence in results. This improves credibility and enables councils to better direct resources."

A table is also provided which identifies the uses of traffic count data in a typical RCA.

Discussion

The reasons provided are not new, and so the question needs to be asked as to why RCA's have not felt the need to implement more robust traffic counting processes in the past.

As wide uptake by all RCA's is required in order to be able to provide robust traffic data to inform national policy and planning then it is essential that RCA's consider that the value added to their operations of implementing this process is worthy of the effort.

Funding

Historically there has been no consequence on funding of having poor network level traffic count estimates. RCA's are unlikely to consider auditing to be a key area of concern and are more likely to be influenced if robust traffic estimates are a necessary input into programme preparation for some activity classes, and the absence of this input may affect approval of funding applications.

Better Decision making

Within Central Otago targeted traffic counting has been undertaken when required to assist decision making for specific issues. Traffic counting has historically been undertaken on proposed reseal sites, and other sites identified for possible improvement works, in order to assist design and prioritisation of work, and on sites where there is public concern e.g. speeding.

Most roads have been able to be confidently assigned to classifications based on local knowledge.

To date this method has been sufficient to meet the data requirements to support decision making. We do however recognise that there are benefits to Council in having a proactive rather than reactive counting programme. These are as follows:

- Reduced risk from staff attrition, and resulting loss of local knowledge. This has been identified as a high risk area within our Asset Management Plan.
- To enable more complex decision making processes to be implemented successfully, such as dTims, and network planning models, which require robust AADT estimates across the entire sealed network.
- To enable more targeted maintenance and renewals regimes to be implemented and prioritised within the current constrained funding environment based on the relative needs of all roads across the network.
- The desire for immediate access to reliable information at the desktop for reports and designs rather than waiting for counts to be done.

- To enable the impacts of growth, changes in land use, and increased heavy vehicle use to be modelled and monitored for future planning.
- To enable immediate factual, data based responses to be provided to customers and elected members without waiting for counts to be undertaken.

Recommendation

This section needs to convince RCA's of the value to them of populating the traffic counting module in order to achieve wider industry up-take.

Greater emphasis should be provided regarding the benefits to RCA's of having robust traffic count estimates across the wider network instead of focussing counts just on sites of current interest. The areas of reduced risk from staff attrition, ability to undertake modelling, ready access to robust information, and ability to apply more advanced asset management practises in terms of optimised decision making are key selling points.

The fact that this process shifts from reactive to proactive counting, and that the initial effort to set up the process will be offset by efficiencies regarding the number of counts required in the future is also a key point.

If funding is a principal reason for implementing this process then NZTA Planning and Investment staff could encourage RCA's to use of the traffic counting module.

2.4 The RAMM Traffic Counting Module

The RIMS guideline recommends the use of the RAMM traffic counting module, and provides an eight page overview of the following:

- The concept of traffic links, and how these can be created
- Improved targeting of count programmes by introducing a cyclic counting regime
- Improving converting short duration ADT to estimated AADT by using different seasonal traffic profiles
- Improving the application of traffic growth rates across different parts of the network
- Improving estimates on uncounted road sections by associating to count sites on other sections as a ratio

The RAMM instruction manual provides a 336 page detailed instruction on how to implement the process. The manual provides sufficient detail to guide an unfamiliar user through most of the process.

Discussion

There are a number of decisions which need to be made throughout the implementation. While the RIMS guide briefly touches on these, and the RAMM guide provides instruction on how to enter the decisions, there is a lack of guidance for the uninitiated on what the appropriate decision is in different situations.

Each stage needs to be completed in order to proceed to the next stage of the process. It would have been helpful if the stages had been outlined in the RIMS Guide, and an overall understanding of what the complete process is prior to commencing.

While the RAMM Manual is very good in terms of instruction, the level of detail contained was initially overwhelming. In contrast the RIMS Guideline was targeted at a high level and it would have been helpful if it had provided more guidance regarding what factors should inform the decisions required.

The RAMM guide provides a table which outlines 16 stages. On first reading this appears to be a very large task, however some of the stages are relatively simple and quick, while others require some pre-planning in order to achieve them efficiently.

The process can be completed to a fairly advanced stage over a relatively short time frame. Our initial challenges occurred as a result of a lack of direction in how we might go about grouping roads for different information requirements. Once we had established a methodology on how we were going to group roads for the different variables then the process was relatively straightforward to apply up to stage 10.

There is opportunity for the RIMS guide to provide assistance in this area by identifying those steps which are quick to apply, and guidance on how the more complex processes can be planned (e.g grouping of roads for sample groups, growth rates etc) prior to commencing implementation in order to achieve them robustly and efficiently.

Recommendation –An appendix be provided to the RIMS Guideline which outlines the RAMM process and identifies what variables need to be defined at each step, provides reference to where guidance on appropriate responses for these variables can be located, and identifies if the process can be undertaken in bulk using RAMM filters.

2.5 Variables in The RAMM Module which Must be Populated

There are several variables which need to be populated as part of the initial set up process in RAMM Manager. We were unsure as to what an appropriate answer was for the two variables which are discussed below, and what the implications were of different choices in populating these fields.

Number of Years of Historical Count Data to Use

The user has to select the number of years of count data to use in the Recommended Count Site creation calculation. RAMM suggests basing this on when new technology or practises changed to improve the accuracy of the existing counts. It also recommends only using counts where the count duration has been entered into RAMM. The RIMS guideline doesn't provide any assistance regarding this.

We would suggest that reviewing the quantity of traffic count data that the RCA has in the system for each year is a good place to start to provide them some guidance as to number of years of count data to enter in this field.

It is possible to enter the duration of counts as a bulk update, so if Councils have typically undertaken 7 day counts, and don't have a lot of historical data then it may be worth entering the count duration in order to use a longer period of historical information.

Recommendation – some suggested ranges of historical count data to use, based on different existing data scenarios would be helpful.

Network Coverage

The user has to define the % of network traffic which they want to count.

The RIMS Guide doesn't provide any guidance as how to establish what this should be.

Recommendation – it would be helpful to have guidance regarding appropriate network coverage, and what the implications of different choices might be for different types of networks.

2.6 Fix Legacy Data

The module requires information from fields which may not have been entered during the original uploading of count information for the historical data that is going to be used as a result of the selection above for the number of years of historical data to use. This includes the duration of the count, with the options being 24 hours, three days, or seven days.

If the duration was for 24 hours then the time of day is required.

As discussed above, duration can be entered as a bulk update if required, which means this is not an onerous task if it is entered at this point. Central Otago District Council typically undertakes 7 day counts, so we decided that it was worth entering this information as none of our historical data had this field included.

Recommendation

Develop better tools in RAMM to enable database owners to identify incomplete data, or data inconsistencies.

2.7 Generate Traffic Links

Road Type Profile

At this point it is necessary to assign a traffic flow profile to the road. There are seven different profiles within the system and ability to create specific ones.

The RAMM guide includes a flow chart for determining which profile is appropriate. The RIMS guideline provides an overview of why seasonal profiles are required but does not provide any guidance as to which profile should be used and when.

The flow chart for this is a bit confusing. The question “Does it have high Friday and Sunday flows in opposite directions” pointing to a road type of Urban/Rural Boundary was confusing. Following the chart, an urban residential street will be called an urban commuter arterial.

Recommendation – explain in more detail in the RIMS guide where typical types of roads might map to within the seven seasonal profiles for road types. This would make it easier to group roads of similar types using different RAMM filters and assign them in bulk.

Traffic Growth Group

This function enables previous ADT estimates that have not been counted in the current year to be updated using the average traffic growth recorded at similar sites that have been counted in the current year.

The user needs to group roads which will have similar growth rates together. There are six different groups set up in the system, which are numbered 1 to 6. Neither the RIMS guide of the RAMM manual identify what the different characteristics of the groups are, so we have assumed that it doesn't matter which group number is used, provided all the roads assigned to the group are similar.

The roads can be filtered using different RAMM fields and assigned in bulk to different traffic growth groups.

While the RIMS guide outlines the purpose of this function, some more specific guidance on how RCA's might set up their traffic growth groups would be helpful, and if the existing set up for the different traffic growths in RAMM is relevant.

In the absence of any guidance on this, and with only a basic level of understanding, the Central Otago District Traffic Growth Groups have been assigned based on Statistic New Zealand's mesh block areas across the district, and split between urban and rural roads. Potentially there could be huge variability in the way in which this part of the database is set up across various RCA's, which could have significant effect on the accuracy of estimates across the New Zealand network.

Recommendation – provide some examples in the RIMS guide of what best practise is in determining how to assign roads to traffic growth groups, explain the

relevance (or not) of the different traffic groups currently set up as Traffic Groups 1 to 6.

AADT Band

The user has to assign an AADT band to each traffic link. Traffic links are then grouped dependent on whether they have a high, medium or low AADT band.

We have assumed that this grouping should be set relative to local conditions, and in the Central Otago database these have been set as shown on the table below.

Low	0 – 500
Medium	500 – 2000
High	2000 and above

We have used pre-set values under the Pavement Use Field to filter these bands for assigning in bulk.

Recommendation - Clarify if the AADT band should be set based on relative traffic volumes within the database area or based on a national criteria.

2.8 Generate Count Sites

RAMM generates recommended count sites. A count frequency needs to be assigned to each count site. The RIMS guide provides a greater level of guidance regarding this than the other variables.

The choices are core (annual), bi-annual (year 1 or year 2), and five yearly (years 1 to 5). The example provided in the RIMS guideline was more specific to an urban network.

We have set up a frequency where our highest classification are measured bi-annually, and all other roads on a five year rotation. It was helpful to set up a table which outlined how the roads would be assigned prior to undertaking this task.

We anticipate changing a sample of roads to Core later in the process.

Recommendation – Suggest that the RCA defines a methodology for how sample groups will be set prior to starting this process.

2.9 Associate Traffic Links

This involves linking a number of roads to a particular count site on another road by determining what percentage of the traffic at the count site will travel along each individual road.

This means that when a count is undertaken at the count site, the estimated ADT is used to automatically update the estimates on road sections linked to that count site. This efficiently extends the coverage of the counting programme.

This part of the process requires careful consideration as to what the traffic relationship is between different roads, and cannot be done in bulk, so it is time consuming. There is a trade off at this point regarding the level of accuracy, and the time required to achieve a higher level of accuracy.

It would be worth having some discussion within the RIMS guideline regarding the value of spending more time to have a greater level of accuracy at this point or not.

We have completed the RAMM process up to this stage which is step 10 and we are now finding this stage challenging. The remaining six steps appear to be related to cleaning up any issues which may exist and scheduling the traffic counts. We expect these stages to be relatively straightforward.

Recommendation - A list of people who have experience using the RAMM traffic count function, and are willing to be contacted by others for advice, be included on the RIMS website.

2.10 Level of Skill Required

The RIMS Guide identifies that "when setting up the traffic link model, asset managers need to be diligent in incorporating network knowledge and understanding of forecast growth and network change".

We are of the opinion that a high degree of local knowledge regarding the functions and typical use of individual roads on the network is required to ensure the model is robust. At the same time the process is complex enough that a reasonable level of understanding of RAMM is required in order to apply it. This then creates questions regarding the ability of smaller Councils who do not have internal RAMM capability to implement the model.

Given that setting up the module is a one off exercise, it may not be worth in-house staff spending the time to become familiar with the traffic counting module.

We have been made aware by other Councils who had populated the traffic Count module prior to RAMM 6.0 that there was an issue with RAMM 6.0 where the data that had been populated was lost and has had to be re-entered. We expect that this issue will be resolved by RAMM Ltd.

Our opinion is that this is a process where specialist Consultant input would be of value, but this should involve working alongside Council staff to ensure that local knowledge was incorporated.

Recommendation: - The RIMS Guideline provide information regarding the level of skill and time requirements to implement this process, and provide advice to RCA's regarding how they might consider using Consultants for parts of this process. In doing so it will need to be stressed to RCA's the input that will be required from them to ensure local knowledge is incorporated into the module. A Consultant briefing template could be developed to assist Local Authorities regarding this.

That the issues with RAMM 6.0 which have caused loss of data in the Traffic Counting Module be addressed as a matter of urgency and that testing of future versions include databases where the traffic count module has been populated.

2.11 Uploading Metro Count Data into RAMM

The RIMS Guideline does not include any reference to the process of uploading Metro Count data into RAMM. We believe that it would be appropriate to include the use of this RAMM function in the guideline as recommended best practise as it contributes to the objective of:

“create a bottom up process that seeks to provide RCAs with the knowledge, tools and systems to improve their local traffic monitoring .

The advantage of using the uploading function is that it improves efficiency by reducing the time required for inputting, eliminates input errors, and ensures all the data recorded in the counter is recorded in the database.

Central Otago District has been trying to use the uploading function in RAMM which has been extremely problematic, and has taken four months of consistent phone calls and emails to both RAMM and Metro Count to resolve the problems.

Over this period of time there has been a bug in RAMM 6.0 which caused problems with uploading files, and the second problem was around how the Metro Count import files were generated. There were two steps in the process which were not documented around how the Report Type needed to be selected, the other about how to add the extra vehicle classes to the Import file

Our IT people have now created an instruction document which outlines these steps in more detail which we are willing to make available to RIMS.

The RAMM help desk staff were unfamiliar with the Metro Count process and as a result the assistance provided was not as effective as it could have been. We are of the understanding that they have not had calls regarding these issues from any other RCA, which may be an indication of limited use of this function.

It would be helpful if there were a group of people within the industry who were willing to be identified and contacted to provide advice to others who may be having difficulty with this process.

Recommendation -

Use of the RAMM Metro Count upload function be encouraged in the RIMS Guide.

A list of people who have experience using the Metro Count upload function, and are willing to be contacted by others for advice, be included on the RIMS website.

2.12 Inclusion of Heavy Vehicle Estimates in the Module

The Traffic Counting Module does not currently utilise the heavy vehicle count data that is provided from classifier counts. Heavy vehicle use has a significant impact on asset deterioration and inclusion of this in the traffic model is required in order to improve asset management decision making and deterioration forecasting.

Recommendation:

Further program development be undertaken to enable inclusion of heavy vehicle count data in the estimating tool.

3 Recommendations

Specific Recommendations	Suggested Action to be Taken
<ul style="list-style-type: none"> Uptake by the majority of RCA's is required if this method is to achieve the desired objectives 	<p>REG AMP Group to promote uptake</p>
<ul style="list-style-type: none"> Greater emphasis should be provided regarding the benefits to RCA's of having a proactive model rather than undertaking reactive counts. Key benefits to emphasise are reduced risk, information required for modelling, and data requirements for advanced asset management practises. 	<p>Include the benefits to RCA's in presentation material</p>
<ul style="list-style-type: none"> If funding is a principal reason for RCA's to implement this process then NZTA Planning and Investment staff should increase the profile of this requirement. 	<p>NZTA P & I Team to promote uptake</p>
<ul style="list-style-type: none"> An outline of the RAMM process be included within the RIMS Guideline, which identifies what variables need to be defined at each step, provides reference to where guidance on appropriate responses for these variables can be located, and identifies if the process can be undertaken in bulk using RAMM filters. 	<p>Include as an appendix to RIMS Guideline</p>
<ul style="list-style-type: none"> Suggested ranges of historical count data to use, based on different existing data scenarios be included in the RIMS Guide 	<p>Include as an appendix to RIMS Guideline</p>
<ul style="list-style-type: none"> Network coverage, and what the implications of different choices are for different types of networks be included in the RIMS Guide. 	<p>Include as an appendix to RIMS Guideline</p>
<ul style="list-style-type: none"> Develop better tools in RAMM to enable database owners to identify incomplete data or data inconsistencies 	<p>Promote as an update to RAMM</p>
<ul style="list-style-type: none"> Explain in more detail in the RIMS Guide where typical types of roads might map to within the seven seasonal profiles for road types 	<p>Include as an appendix to RIMS Guideline</p>
<ul style="list-style-type: none"> Provide some examples in the RIMS Guide of what best practise is in determining how to assign roads to traffic growth groups, and explain the relevance (or not) of the different traffic groups currently set up as Traffic Groups 1 to 6. 	<p>Include as an appendix to RIMS Guideline</p>
<ul style="list-style-type: none"> Clarify if the AADT band should be set based on relative traffic volumes within the database area or based on a national criteria. 	<p>Include as an appendix to RIMS Guideline</p>

Specific Recommendations	Suggested Action to be Taken
<ul style="list-style-type: none"> ▪ Suggest that the RCA defines a methodology for how sample groups will be set prior to starting this process in the RIMS Guide 	<p>Include as an appendix to RIMS Guideline</p>
<ul style="list-style-type: none"> ▪ A list of people who have experience using the RAMM traffic count function, and are willing to be contacted by others for advice, be included on the RIMS website as a support network 	<p>To be considered by RIMS, REG AMP Group to also initiate discussions regarding this at regional presentations</p>
<ul style="list-style-type: none"> ▪ That the issues with RAMM 6.0 which have caused loss of data in the Traffic Counting Module be addressed as a matter of urgency and that testing of future versions include databases where the traffic count module has been populated 	<p>Notify RAMM Ltd.</p>
<ul style="list-style-type: none"> ▪ The RIMS Guideline provide information regarding the level of skill and time requirements to implement this process 	<p>Include as an appendix to RIMS Guideline</p>
<ul style="list-style-type: none"> ▪ The RIMS Guideline outline how Consultants could be used for parts of this process. In doing so it will need to be stressed to RCA's the input that will be required from them to ensure local knowledge is incorporated into the module. A Consultant briefing template could be developed to assist Local Authorities regarding this 	<p>Include as an appendix to RIMS Guideline</p>
<ul style="list-style-type: none"> ▪ Use of the RAMM Metro Count upload function be encouraged in the RIMS Guide 	<p>Include as an appendix to RIMS Guideline</p>
<ul style="list-style-type: none"> ▪ A list of people who have experience using the Metro Count upload function, and are willing to be contacted by others for advice, be included on the RIMS website 	<p>To be considered by RIMS, REG AMP Group to also initiate discussions regarding this at regional presentations</p>
<ul style="list-style-type: none"> ▪ Further program development be undertaken to enable inclusion of heavy vehicle count data in the estimating tool. 	<p>Request RIMS consider progressing development of the tool to include heavy vehicle count data</p>