Saferoads
A local road safety initiative

Safer Roads and Roadsides

Guidelines for a program to improve the safety of the local rural roads and roadsides

A Resource for Local Government

March 2008

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Developed by: VicRoads Road Safety and Network Access Directorate.

Acknowledgements:
This resource is based on a pilot safer roads and roadsides program initially conducted in the Municipalities of Ararat, Yarra Ranges, Golden Plains, Bass Coast, Central Goldfields and Greater Geelong in 2005-2006 and with the following municipalities in 2006-2007 Casey, Campaspe, Surf Coast, Golden Plains, Greater Geelong and Mildura. Other municipalities have subsequently implemented similar programs and their experience has been drawn on in the preparation of the resource.

The contribution of the following people is acknowledged with special thanks:

Rick Hattam, Chris Quinn, Shire of Golden Plains
Margot Busch, City of Greater Geelong
Don Phillips, Ararat Rural City

Foreword

The Safer Roads and Roadsides resource has been developed to assist municipalities to identify and treat road and roadside hazards on local rural roads.

The resource aims to be a practical guide to achieving the following objectives and therefore leading to a reduction in the overall road safety risk:

- Increased knowledge of road safety risk;
- Understanding of available data sources for identifying local crash risks (including the risk associated with roadside hazards);
- Identification of appropriate cost effective treatments to reduce road safety risk;
- Ability to prioritise treatments.

It aims to assist municipalities to meet some of the obligations required under the Road Management Act 2004, arrive alive 2008-2017 Victorian road safety strategy and the Safe System approach to road safety.

What's in the resource?

The Safer Roads and Roadsides resource provides a range of activities and tools for local government to identify prioritise and treat high risk locations with a cost-effective engineering approach.

The resource will assist municipalities to:

- Identify high road safety risk locations;
- Undertake a risk assessment of each site, route or the network;
- Prioritise treatments;
- Implement engineering treatments at high road safety risk sites.

The main focus of the resource is treatment of high road safety risk sites on local rural roads, with the most suitable cost effective engineering treatments.

The resource can be used by:

- Traffic engineers;
- Road maintenance staff;
- Planners;
- Public relations officers;
- Road safety officers/coordinators.

Why Should Local Government Get Involved?

Managing road safety risk continues to be a critical function of road asset owners. It is important that Victoria uses risk identification and assesses the cost effectiveness of countermeasures to make our roads safer.

Local government plays a key role in reducing trauma on our roads. With the majority of councils currently implementing their municipal road safety strategies, local government is having more of an impact on improving road safety in Victoria than ever before. The Safer Roads and Roadsides program is aimed at improving high crash/high road safety risk sites on local rural roads through the use of cost effective engineering treatments.

The Safe System approach has been adopted as a key direction for road safety in Victoria and local government is encouraged to incorporate this approach into their road safety practices.

Key elements of the Safe System approach which are addressed within this program are integrating the elements of improving the road and roadsides and travel speeds. Councils will also have the opportunity to engage the community through this program, in particular to highlight the road safety risks on their roads and highlight the benefits of treatments being implemented.

Contents of the Resource

Improving the Safety of Rural Roads

Since Victoria's road safety strategy arrive alive! 2002-2007 was introduced an estimated 467 lives have been saved since 2001 when the road toll was 444.

In 2007, there were 332 deaths on Victoria's roads, of which 174 occurred in country areas. Of those, 108 were drivers, 40 passengers, 8 were pedestrians, 17 were motorcyclists and pillion passengers and 1 was a bicyclists.

This presents a major challenge for the road toll to be reduced in country areas. The Safer Roads Program and the Safe System approach have set the government direction for addressing the road toll in rural Victoria.

Safer Roads Program

A key program being implemented by VicRoads as part of arrive alive! is the $240 million Safer Roads Program. This involves implementing a range of improvements on country and outer metro roads by 2007 to address the high number of fatalities and serious injuries on country roads. The program builds on the success of the $240 million Statewide Blackspot.

Since 2004, a number of road safety improvements addressing run off the road crashes on rural and outer metropolitan arterial roads were funded under the Safer Roads Program. Typical treatments including shoulder sealing, safety barriers and tactile edgelines.

As the first program of its kind to address the causes of crashes on rural and outer suburban roads, the Safer Roads Program is an important part of the effort to further reduce deaths as well as serious injuries on Victoria's roads.

The Government has announced a further $597 million over 10 years commencing in 2007/2008 for further infrastructure improvements on arterial roads.

This Safer Roads and Roadsides countermeasure package aims to build on the success of the Safer Roads Program to target local rural roads. A number of the learning and tools from the arterial road program have been incorporated into this package.

Safe System Approach Philosophy

The goal of road safety programs is to achieve a Safe System. The Safe System approach has been adopted by Victorian road safety agencies as a new direction for road safety in Victoria.

The approach is based on a powerful and challenging concept that road users who are alert and fully compliant with road rules should not lose their life as a result of a crash on the road system.

It assumes that:

- Crashes will happen even with a focus on prevention;
- Ongoing crash analysis and understanding needs to occur;
- Road users comply with road rules.

This innovative safe system approach to road safety aims to ensure that crash forces will always be survivable and injuries significantly reduced through road user compliance with road rules and three key elements of system design:

- safer road & roadside conditions;
- safer vehicles (including primary and secondary safety features), and;
- travel speeds as influenced by speed limits.

A Safe System approach helps us to understand the interaction between the three road use elements and to develop effective countermeasures to address these key challenges.

Actions and treatment types that contribute to a safe system

Planning and approval process

- Planning of new roads to minimise safety risk;
- Standards and approval for location of roadside poles, trees and other hazards;
- Control of roadside development and access.

Design of new roads

New roads present an opportunity to incorporate safe features in a road that may not be present in existing roads, e.g. roundabouts, divided road, desirable clear zones, and under grounding of services.

Infrastructure Improvements

In combination with the other two elements of a Safe System (safer vehicles and safer speeds) some infrastructure treatments can potentially achieve a full Safe System, e.g.:

- Removal of all roadside hazards;
- Erection of forgiving safety barriers;
- Intersection treatments such as roundabouts.

Maintenance

It is important for road authorities' maintenance of the roadside to ensure that the desirable clear zone standard is achieved as a minimum.

Risk reduction approach

It will not be possible to introduce a full Safe System which will eliminate all risk of serious injury in the short term. However strategies should be developed which work towards a Safe System using risk reduction techniques to identify treatments that cost-effectively maximise the overall reduction in road safety risk with available funds and other resources.

A range of risk analysis and reduction strategies is available for road authorities to use, as described below. The strategy adopted will depend on whether the sites or road lengths being considered have a significant crash history, the scope of the program (e.g. treatment of higher risk roads, certain crash types or the whole road network), and the available funds:

1. Treatment of blackspots and blacklengths

- Identify and rank accident blackspots / blacklengths from agreed criteria;
- Identify treatments to reduce crash risk at these locations;
- Apply treatments to highest ranking sites and lengths according to availability of funds.

2. Treatment of higher risk routes

- high crash rate road lengths;
- highest risk locations within those lengths;
- cost-effective treatments to reduce crash risk at highest risk locations;
- crash reduction expected from these treatments.

As an example of this approach, recently VicRoads used a road safety risk tool to assess the likelihood and consequence of run off road crashes, and applied it to 20km sections of the Victorian open road network where those crashes were most frequent in the last 5 years.

Countermeasures were identified (such as barriers, shoulder sealing) to address sections within those 20km section where risks were higher. Benefit cost ratios were then calculated based on that portion of the recorded crashes that would have benefited from the proposed countermeasure treatments. BCR's usually in excess of 3 are anticipated.

This Safer Roads and Roadsides resource applies this approach to local roads to identify future cost effective treatments for high road safety risk sites.

3. Treatment of risk over the whole road network

- Determine safety risk throughout road network;
- Identify cost effective treatments and where they are justified in the light of available funds.

Treatment types to reduce risk

Infrastructure Improvements

Examples of treatments that reduce but do not eliminate the risk of serious injury or death are:

- Lane and shoulder widening;
- Shoulder sealing;
- Increasing the width of the roadside that is clear of roadside hazards;
- Improvements to delineation and signing;
- Improved skid resistance.

The ongoing application of such treatments as funds permit, in combination with speed management and improvements in vehicle safety, continually works towards the achievement of a full Safe System.

Maintenance

Use road safety infrastructure risk assessment tools to identify the maintenance tasks which will lead to the most cost-effective reductions in road safety risk, such as:

- Maintaining or increasing roadside area clear of hazards such as trees, to maximise recovery area for errant vehicles or sight distance;
- Keeping road, roadside and infrastructure in good condition – removing loose material from pavement, maintaining road surface, drains, barriers, signs and markings, traffic signals.

The safety standard of roads and roadsides has a major impact on crash likelihood and on crash outcome. From 2002 to 2006, run-off-road and hit fixed object crashes represented 40 per cent of fatal crashes and 33 per cent of serious injury crashes in rural Victoria.

Key aspects to improve the safety of the road and roadside include the use of:

- Safety barriers to help to protect motorists from roadside hazards (refer Fig. 4);
- Shoulder sealing to help drivers regain control if they run off the road;
- Tactile edgelines to alert drivers if they stray too close to the road.

Fig 1. Use of barriers to improve the roadside safety

The Challenge

Use of Barriers

This program adopts aspects of the Safe System Approach, in particular improving the safety effectiveness of the combination of the elements of the road environment and safe speeds.

Fig 2. Use of splitter island and line marking to improve intersection delineation

Improved intersection delineation

THE FACTS: Crashes in Rural Victoria & Local Roads

The 174 fatalities on country roads resulted from 146 crashes. A large proportion of these crashes were run off the road crashes. From 2002 to 2006, run-off-road and hit fixed object crashes represented 40 per cent of fatal crashes and 33 per cent of serious injury crashes in rural Victoria.

Of the fatal crashes on country roads in 2007:*

- 75 (51 per cent) involved a collision with fixed objects such as poles, trees, fences etc;
- 47 (32 per cent) involved a collision between 2 or more vehicles;
- 22 (15 per cent) occurred at intersections;
- 8 (5 per cent) involved a vehicle striking a pedestrian;
- 12 (8 per cent) involved an overturned vehicle (not involving a collision); and
- Heavy vehicles were involved in 31 (22 per cent) of fatal crashes on country roads, resulting in 46 fatalities (29 per cent of all country fatalities).

(*There is overlap between these categories)

Over the past five years (1 January 2002 to 31 December 2006*), nearly 10,000 casualty crashes occurred on local rural roads (urban and non-urban), averaging 2,000 crashes per year. Over the five years:

- 293 people were killed and over 4,400 people were seriously injured;
- 3 per cent were fatal crashes;
- 37 per cent were serious injury crashes;
- 51 per cent were on 40-60km/h roads;
- 39 per cent were on 100km/h roads;
- 37 per cent were run off road crashes (73% of these resulted in hitting a fixed object);
- 33 percent occurred at intersections (50 per cent of these were side impact crashes);
- 6 per cent were rear end crashes;
- 8 per cent involved pedestrians;
- 22 per cent involved a motorcycle and/or pillion passenger; and
- 4 per cent involved a heavy vehicle.

(*There is overlap between these categories.)

Over the past five years (1 January 2002 to 31 December 2006*), nearly 5,000 casualty crashes occurred on local non-urban rural roads, averaging 1,000 crashes per year. Over the five years:

- 220 people were killed and over 2,600 people were seriously injured;
- 4 per cent were fatal crashes;
- 44 per cent were serious injury crashes;
- 77 per cent were on 100km/h roads;
- 54 per cent were run off road crashes (68% of these resulted in hitting a fixed object);
- 13 percent occurred at intersections (41 per cent of these were side impact crashes);
- 6 per cent were head on not overtaking;
- 1 per cent involved pedestrians;
- 34 per cent involved a motorcycle and/or pillion passenger; and
- 5 per cent involved a heavy vehicle.

(*There is overlap between these categories.)

Over the past five years (1 January 2002 to 31 December 2006*), over 5,000 casualty crashes occurred on local urban rural roads, averaging 1,000 crashes per year. Over the five years:

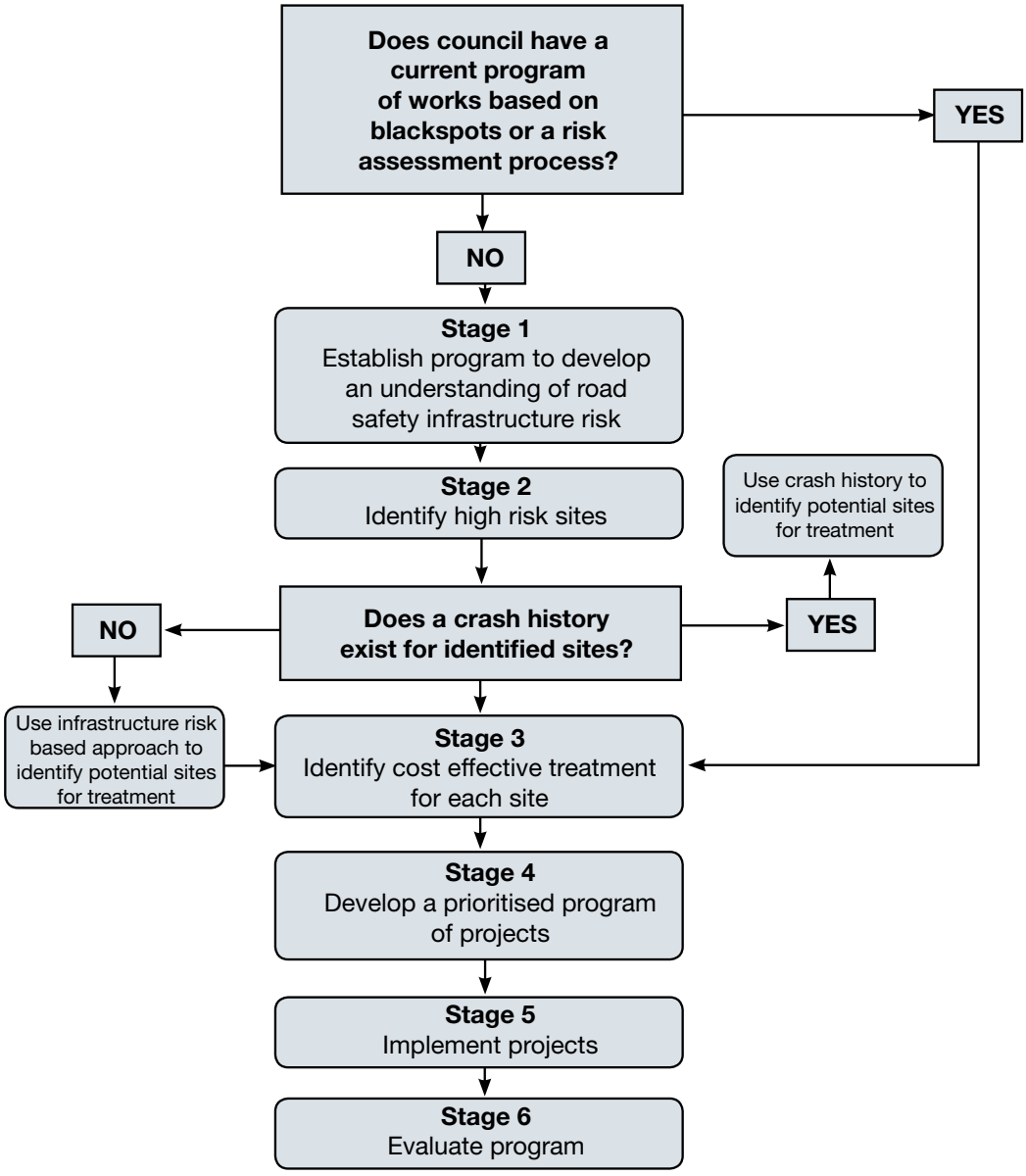
- 73 people were killed and over 1800 people were seriously injured;
- 1 per cent were fatal crashes;
- 31 per cent were serious injury crashes;
- 91 per cent were on 40-60 km/h roads;
- 52 percent occurred at intersections (52 per cent of these were side impact crashes);
- 20 per cent were run off road crashes (88% of these resulted in hitting a fixed object);
- 10 per cent were rear end crashes;
- 14 per cent involved pedestrians;
- 11 per cent involved a motorcycle and/or pillion passenger; and
- 3 per cent involved a heavy vehicle.

(*There is overlap between these categories.)

The statistics indicate attention should be placed on improving the rural local roads, in particular run off road crashes in non-urban areas and intersection crashes in urban areas.

Process for Developing a Safer Roads & Roadsides Program

Outlined below is a suggested framework for developing a Safer Roads & Roadside program of work. However, the process you follow will depend on your council's current approach to improving safety on local roads. The number and type of crashes will also affect how the program is developed.



Stage 1 – Establish program to develop an understanding of road safety infrastructure risk

A key aspect to this program is to have a sound understanding of crash prevention, reducing injury severity and conducting a risk assessment of crash and high risk sites.

Ideally, this will involve developing an understanding of the following areas:

- The Safe System approach to road safety;
- How to prioritise high risk sites based on crash rates and infrastructure risk assessments;
- Analysis of high crash and high risk locations, particularly those relating to the major types of crashes within the municipality;
- Appropriate treatments for various types of crashes.

VicRoads hosts a number of road safety engineering professional development workshops. The table below provides an outline of the types of courses available. Council's may consider the optional training programs below, if a skill gap is identified:

TOOLS **Optional training programs:**

Road Safety Engineering Workshop (5 days):
Learn to undertake crash analysis, understand roadside safety issues and conduct road safety audits.

☎ contact John Coles, Workshop Manager at VicRoads on (03) 9854 2753

Crash Site Investigation Workshop (2 days):
Learn to undertake crash analysis.

☎ contact John Coles, Workshop Manager at VicRoads on (03) 9854 2753

Road Safety Audit workshop (2 days):
Learn to develop proposals for treatments on existing roads.

☎ contact John Coles, Workshop Manager at VicRoads on (03) 9854 2753

Roadside Safety workshop (1 day):
Learn about roadside hazard management, crash barriers and crash cushions.

☎ contact John Coles, Workshop Manager at VicRoads on (03) 9854 2753

Road Safety Risk Manager training (1 day):
Learn to use the Road Safety Risk Manager tool.

☎ contact ARRB on (03) 9881 1555

Stage 2 - Identify High Risk Sites

This stage involves identifying sites to be considered for treatment under this program. These sites could be identified through the following objective means:

- Review of current blackspots / black lengths;
- Crash data analysis;
- Results of Road Safety Audits and / or Road Safety Infrastructure Risk Assessments;
- Requests and feedback from the community (to capture incidents not recorded, such as near misses and property damage);
- Consultation with local police and emergency services regarding safety concerns and property damage.

After compiling a list of sites, Council needs to determine a minimum threshold to help to identify appropriate sites to consider for this program.

The threshold may be determined by using measures such as:

- traffic volume;
- crash history;
- a road safety risk assessment.

In using a road safety risk assessment approach, consideration should be given to the likelihood and consequence of an incident occurring in the locations you have identified. This can be done using simple application of crash reduction factors or a comprehensive approach using tools such as ARRB Netrisk software.

The aim of stage two is to identify a maximum of 20-30 sites that can be treated with cost effective treatments These sites will be taken forward to consider in stage three – identify cost effective treatment for each site.

TOOLS

Crash Stats:

The Victorian crash statistics and mapping program available on www.vicroads.vic.gov.au

Stage 3 - Identify Cost Effective Treatment for Each Site

This stage involves conducting an inspection of all identified sites or routes to be considered for cost effective treatments.

This site inspection should aim to identify the most suitable treatment in order to:

- Prevent a crash occurring at the site in the future;
- Minimise road safety risks and/or;
- Reduce the severity of any future crash.

Before

After

This program will focus on improving sites through cost effective treatments. A range of cost effective improvements are available to treat two of the most common crash types in rural Victoria – run-off-road, hit fixed object and intersection crashes. These are outlined in the table below:

Table 1 – Cost Effective Treatment Types

Intersection Treatment Types	Run off Road Treatment Types
High skid resistance surfacing	Safety barriers (minimum 50 metres required)
Dedicated right turn lanes	Warning signs (curves)
Splitter islands	Curve alignment markers
	Guide posts
	Line marking
	Tactile edge marking (when shoulder is sealed)
	Reduce speed limits (signs)
	Sealed shoulders

Typical cost and benefits for specific improvement options that would constitute the main types of treatments appropriate for this program are outlined in the table below.

Table 2 – Treatment Cost and Benefits*

Treatment Type	Typical Cost ($,000s)	Typical Casualty Crash Reduction (1)
Intersection Treatments		
High skid resistance surfacing	$0.20 - $0.50 per m^2	20 – 30%
Dedicated right turn lanes	$50 - $200	20 – 30%
Splitter islands	$2 – 10 per site	30 – 45%
Run off Road Treatments		
Safety barriers	$0.1 - $0.2 per m	50 – 90%
Delineation (signs and line marking)	$2 - $5 per km	10 – 20%
Tactile edge marking	$2 - $2.5 per km	10 – 20%
Reduce speed limits (signs)	$0.1 - $0.2 per sign	Approx 20% for 10km/h reduction
Sealed shoulders	$30 - $40 per km	40 – 50%

* These figures are based on previous infrastructure improvement projects, including the $240m Blackspot Program and $130m Safer Roads Program.

(1) Casualty crash reductions apply to all crashes for intersection projects and all run-off-road crashes for run-off-road projects unless otherwise indicated.

TOOLS

Traffic Engineering Manual Volume 1 – Traffic Management

Traffic Engineering Manual Volume 2 – Signs and Markings

VicRoads Road Design Guidelines Parts 1 – 11

Austroads Guide to Traffic Engineering Practice Parts 1 – 15

Available from VicRoads Bookshop on (03) 9854 2782

Stage 4 – Develop a Prioritised Program of Projects

The process used to prioritise treatments will depend on the crash history of the identified sites in your municipality.

If a significant crash history exists, this can be used to establish a benefit cost ratio (BCR), which can then be the basis for prioritisation.

If no crash history exists, you can use a road safety infrastructure risk management approach (either using a simple application of treatment crash reduction factors to identify the likely change in risk, or a more comprehensive approach using NETRISK/Road Safety Risk Manager) to determine the potential risk reduction at each site by giving it a score, which can be the basis for prioritisation. A BCR can then be estimated for the total risk reduction provided by an appropriate treatment over a length of road.

Both approaches should be considered in prioritising sites.

TOOLS

NetRisk and Road Safety Risk Manager:

The NetRisk tool enables you to undertake an assessment of the whole road network within your municipality to identify and prioritise sites for further investigation.

The Road Safety Risk Manager is a tool to undertake a risk assessment of individual sites. It can assist you to manage, prioritise and track the status of road safety issues on the road network. It can be used for assessing and ranking:

- road safety audit recommendations
- mass action programmes of work (eg guard-rail, line marking, sign replacement)
- safety related routine maintenance issues
- proactive response to road safety issues raised by the community or through regular inspection programmes
- design audit recommendations

Road Safety Risk Manager enables you to compare the crash risk at a site before and after the implementation of a given treatment. The result of the comparison is a Risk Reduction Cost Ratio (RRCR), stating the reduction in units of risk per dollar spent on the treatment.

To obtain further information on the Road Safety Risk Manager visit www.arrb.com.au or telephone (03) 9881 1500 for details.

If a combination of both a BCR and road safety risk score has been used to prioritise all identified sites, preference is recommended to be given to sites with a high BCR when determining the final prioritised list (i.e.: those sites with a high BCR should have priority).

Once a BCR or road safety risk reduction cost ratio (or a combination of both) has been used to prioritise sites, consideration should be given to the program's budget. From this, the final list of works to be undertaken can be finalised.

Stage 5 – Implement Projects

Commence the installation of the program of projects
Commence raising the local community's awareness of the installation of projects via the local media.

Stage 6 – Evaluate Program

Once the identified treatment works have been implemented, the overall program should be evaluated based on the following:

- Media coverage generally by the media releases issued;
- Feedback from local residents / reduction in complaints;
- Feedback from local police and emergency services;
- Crash trends at site (over a 5 yr period) following treatment installation (longer term evaluation).

TOOLS

Crash Stats:

The Victorian crash statistics and mapping program available on www.vicroads.vic.gov.au

Program Planning and Development Checklist

The following checklist identifies the stages of the program and describes some key actions which you may choose to undertake. Councils will be able to identify other actions to be included in each stage. Adequate lead time should be allowed to enable all phases of program planning to be organised successfully.

Program Stage	Key Actions
Step 1 **Getting involved and confirmation of involvement**	☑ As part of Business Area Planning apply to VicRoads to implement the Saferoads 'Safer Roads and Roadsides' countermeasure package ☑ If successful, complete and return to VicRoads: Letter of Agreement, Implementation Plan, Pre Implementation Survey ☑ Arrange for Tax Invoice to be forwarded to VicRoads
Step 2 – Stage 1 **Getting Started Establish Program to Develop an Understanding of Road Safety Infrastructure Risk**	☑ Review the Saferoads 'Safer Roads and Roadsides' countermeasure package ☑ Liaise with VicRoads staff for further assistance on this program ☑ Liaise with Councils who have previously implemented the countermeasure package ☑ Learn how to use CrashStats ☑ Learn how to use NetRisk and/or Road Safety Risk Manager (optional) ☑ Attend a Road Safety Audit or Engineering Workshop (optional)
Step 3 – Stage 2 **Identify High Risk Sites**	☑ Review current blackspots / black lengths ☑ Undertake crash analysis ☑ Conduct a Road Safety Audit and / or Road Safety Risk Assessment ☑ Consolidate community concerns / complaints ☑ Consult with local police and emergency services ☑ Determine minimum threshold for sites ☑ Identify 20-30 sites for potential treatment

Step 4 – Stage 3 **Identify Cost Effective Treatments**	☑ Inspect all identified sites ☑ Determine the most appropriate low cost treatment
Step 5 – Stage 4 **Develop a Prioritised Program of Projects**	☑ Use crash history to determine benefit cost ratio (BCR) (if appropriate) ☑ Use risk management approach to assess all sites (eg. Road Safety Risk Manager if appropriate) ☑ Prioritise the list of sites based on assessing BCR & risk evaluation cost ratio ☑ Select sites to be treated under program (considering budget constraints)
Step 6 – Stage 5 **Implement Projects**	☑ Contract works to treat selected sites ☑ Issue media releases
Step 7 - Stage 6 **Evaluate Program**	☑ Monitor and report on program implementation ☑ Evaluate program (process, community feedback; longer term crash analysis) ☑ Prepare and submit to VicRoads Final Program Report and Post Implementation Survey

Longer Term Approach to Road Safety Improvements

The road safety risk assessment approach used in this program can be applied to other areas of municipal works. Some examples include:

- Managing the roadside, such as utility poles and tree planting. The road safety risk assessment approach ensures the installation of roadside objects does not increase the overall risk, and that potential approaches are cost effective in road safety terms.
- Maintenance program and inspections. The road safety risk assessment approach can help to prioritise works and inspections.
- New road design and construction. The road safety risk assessment approach can help identify appropriate road design standards, for example, the addition of sealed shoulders to a project where there is a potential for run-off road crashes.

By assessing the before and after risk of works you will identify whether the risk will increase or decrease as a result. If risk is likely to increase then a decision may need to be made as to whether the works should proceed or if they can be modified to reduce the risk.

Using a risk based approach in this way can enable existing funding to be utilised to achieve a good overall road safety outcome.

Existing funding can be utilised to achieve a good overall safety outcome when adopting a risk based approach across all areas of municipal works.

Attachments

Attachment 1

Example Programs

Since the introduction of the Saferoads 'Safer Roads and Roadsides' Countermeasure Package in 2005-2006, VicRoads and the TAC has provided funding support to the following municipalities:

Rural City of Ararat
Shire of Bass Coast
Shire of Campaspe
City of Casey
Shire of Central Highlands
Shire of Golden Plains
City of Greater Geelong
City of Mildura
Shire of Surf Coast
Shire of Yarra Ranges

The following are examples of previously implemented programs.

1: City of Ararat

Saferoads
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Final Program Report

Program name:	Safer Roads and Roadsides
Council name:	Ararat Rural City
Contact person:	*Traffic Engineer*
Contact details of contact person: - email - phone - mail	 53550224 PO Box 246, Ararat 3377
Define the problem (crash data): (provide a summary of the problem) - Locations - Times - Road users - Road conditions etc	Rural local road crashes.
Program objectives:	To improve safety on rural local roads. To lower the crash rate.

Target audience(s):	All rural local road users.
Program components: (outline key activities delivered for each component) - Engineering - Education and publicity - Enforcement - Other (eg: advocacy)	To undertake an audit of high-risk rural local roads and identify high risks locations and potential treatments. To prioritise treatments based on the location level of risk and the effectiveness of the treatment. To implement the prioritised works. Sample Data Input Report attached. Sample Priority Works Report attached. Sample Road Audit Report attached.
Program implementation: - Summarise implementation timeline - Role of key partners	May 2006 complete audits June 2006 commence works. October 2006 complete works.
Program evaluation: - Measure each program objective - General comments	After a number of trials a simplified audit process was adopted using a PDA and on-site evaluations of level of risk and effectiveness of treatment. The quick simple approach is required due to the length of road to be inspected. The results to date appear to be sound. There was careful consideration of the need to address the cause of the safety issue. Eg engineering works to improve sight distance, in preference to only reacting to the issue. Eg installation of signs. Whilst it is difficult to clearly identify a 'blackspot' the view is that small ongoing improvements over the network should, over time, lower the crash rate.
Recommendations:	A long term commitment to gradually improve the rural local road network is required. This program should continue.
Future delivery of program: (outline what is planned)	Prior to the introduction of this program Council had already commenced an identical process. It would be expected that this will continue (but at a slower rate) regardless whether this project continues.

Sample of Data Input Report – Ararat Shire

Sample Priority Works Report

Ararat Rural City

Ararat Rural City

Road Safety Site Audits

Items and Treatments Assessed by Priority

Site Mafeking Road

ChFrom	ChTo	Site Rating	Treatment	Item Comment	Score
6.700	6.700	Extremely High Risk Site	Widen Road Width	rocks road width narrow cutting no visibility	25
6.700	6.700	Extremely High Risk Site	Clear Obsticles (Clearzone)	rocks road width narrow cutting no visibility	25

Site Moyston-Willaura Road

ChFrom	ChTo	Site Rating	Treatment	Item Comment	Score
3.891	3.891	Extremely High Risk Site	Clear Obsticles (Clearzone)	trees on shoulders 2 of Other at 3.94 km	25
3.891	3.891	Extremely High Risk Site	Remove Roadside Obsticles	trees on shoulders 2 of Other at 3.94 km	25

Site Rocky Point Road

ChFrom	ChTo	Site Rating	Treatment	Item Comment	Score
7.600	7.600	Extremely High Risk Site	Widen Road Width	vertical alignment bend crest look at alignment	25
7.600	7.600	Extremely High Risk Site	Other	vertical alignment bend crest look at alignment	25
8.700	8.700	Extremely High Risk Site	Other	vertical alignment issue check	25

Site Bowen Mine Road

ChFrom	ChTo	Site Rating	Treatment	Item Comment	Score
.900	.900	High Risk Site	Remove Roadside Obsticles	ho ralignment goes around tree.	20

Site Buangor-Ben Nevis Road

ChFrom	ChTo	Site Rating	Treatment	Item Comment	Score
8.540	8.540	High Risk Site	Other	older style post and rail no signs replace guardrail required see photo	20

Site Deenicull Creek Road

ChFrom	ChTo	Site Rating	Treatment	Item Comment	Score
3.200	3.200	High Risk Site	Widen Road Width	narrow brtige warning signs required	20

Site Lennox Springs Road

ChFrom	ChTo	Site Rating	Treatment	Item Comment	Score
1.600	1.600	High Risk Site	Extend Culvert	Culvert to narrow drop of approx 2m. Install guard rail.	20

Thursday, 8 June 2006 *Page 1 of 10*

2: Shire of Golden Plains

Saferoads
A local road safety initiative

Final Program Report

Program name:	Safe Roads and Roadsides Package
Council name:	Golden Plains Shire Council
Contact person:	*Traffic engineer*
Contact details of contact person: - email - phone - mail	 – (03) 5220 7122 – P.O. Box 111 Bannockburn Victoria 3331
Define the problem (crash data): (provide a summary of the problem) Locations Times Road users Road conditions etc	Following a review of the accident history on roads across the Shire, the Sebastopol-Smythesdale Road was identified as a priority route for treatment. There have been a number of run off road crashes on the Sebastopol–Smythesdale Road including fatalities on a bend near the Haddon–Ross Creek Road intersection. These crashes have involved travel both directions. The Sebastopol–Smythesdale Road route is 12 km long with a traffic volume of 1282 vpd (Aug 2005). The road is classified as is a Link Road.
Program objectives:	The objective of this project is to stop run off road crashes on this route and specifically treat the bend near the Haddon Road – Ross Creek Road intersection.
Target audience(s):	This project is directed at all road users on the route.
Program components: (outline key activities delivered for each component) – Engineering – Education and publicity – Enforcement – Other (eg: advocacy)	Engineering – Crash history was reviewed in an attempt to identify any specific deficiencies along the route. The geometry of the route was assessed by an ARRB "Gipsitrac" survey. Based on the assessment of speed values for curves, delineation of the route was improved by the installation of guideposts, CAMS and speed advisory signage as required. At the bend near the Ross Creek-Haddon Road, shoulders were sealed on both sides of the road for 310 m between the Ross Creek-Haddon Road and Tuddenhams Road. Edgelines, guideposts and CAMS have been installed.
Program implementation: – Summarise implementation timeline – Role of key partners	The project was commenced in October 2005, and the shoulder construction component was undertaken between 31st of May until the 15th of June 2006.

Program evaluation: - Measure each program objective - General comments	Council has received positive community feedback from locals who live in the area and from members of the community who frequently commute using the route to travel to and from Ballarat. The improvements have provided a significant improvement to this busy route. The provision of guardrail or wire rope barrier would compliment the shoulder sealing at the Ross Creek-Haddon Road bend.
Recommendations:	Further support from the Safe Roads Program will allow similar improvements to other routes on the local road network within Golden Plains Shire.
Future delivery of program: **(outline what is planned)**	This particular Program has now been fully delivered however, the crash record of the route will be monitored to determine the effectiveness of the treatments.

Sebastopol–Smythesdale Road near Haddon–Ross Creek Road

Before

After

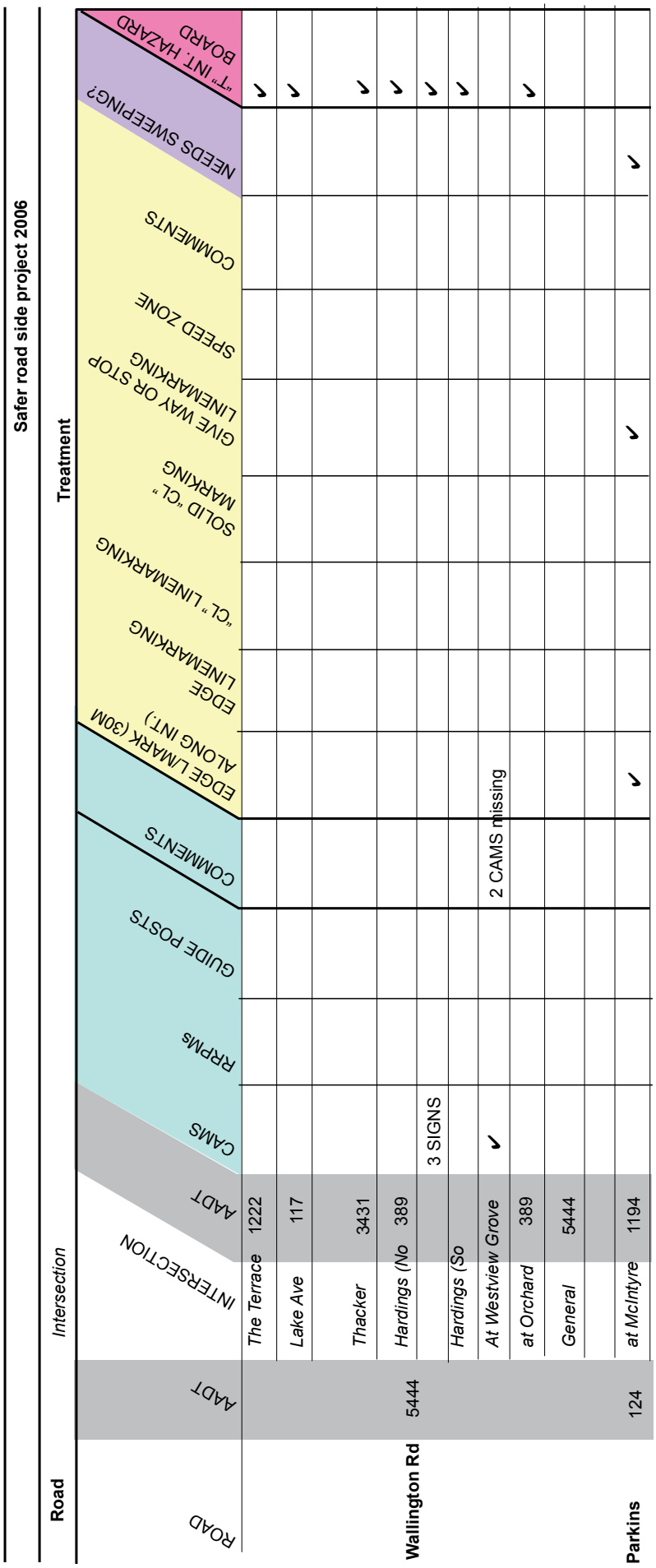
Before

After

Sebastopol–Smythesdale Road near Haddon–Ross Creek Road

Road Name	CH	Intersection with	Chainage Datum	Treatment Proposed	Comments	Progress of Works	Actual Cost
Almurta Glen Forbes Rd	69		Dalyston Glen Forbes Rd	No treatment Required	Section of road is straight and road surface potholed but OK	N/A	$ -
Anderson Hill Rd	1999		Loch Wonthaggi Rd	10m3 vegetation clearance and 3 tree removals from inside bend	Some efforts already made to enhance sight distance through benching	Not Commenced Estimate $880	
Anderson Hill Rd	2120		Loch Wonthaggi Rd	Install W1-3B (L) on new pole		Completed 2/8/06	$250.00
Anderson Hill Rd	2644		Loch Wonthaggi Rd	Install 3x2 CAMS to delineate road alignment around bend and away from private access road	Caution not to obstruct sight distance	Completed 2/8/06	$1,510.00
Bay Rd	361		Bass Hwy	* Install intersection advisory sign on west approach * Install Giveway sign on Marriott Rise entry into intersection * Install intersection advisory sign on Marriott leg * Replace existing intersection advisory sign on east approach with advisory sign showing true alignment and priority.		Completed 14/7/06	$980.00
Bay Rd	2053		Bass Hwy	No treatment Required	Sight distance Ok, pavement Ok. Possibly refers to the Bass Hwy at Pier Rd?	N/A	$ -
Dalyston Glen Forbes Rd	10429		Bass Hwy	* Centerline marking		Completed 17/7/06	$7,530.00

Example of Program of Works – City of Greater Geelong



Attachment 2

News Release 1

Improving Roads to Safe Lives

(Municipality) Shire Mayor *(Name)* today announced a road safety program to reduce crashes on its rural roads.

At least *(XX)* road users are killed or injured by speeding drivers within our municipality said *(Name)* today.

Of those, *(XX)* are killed or seriously injured on our local roads outside towns. Most of these roads have 100km/h speed limits.

Each year it is approximately 1,300 crashes occur on local rural roads across Victoria, with 74 per cent of these due to the driver losing control of the vehicle.

From 2002 to 2006, run-off-road and hit fixed object crashes represented 40 per cent of fatal crashes and 33 per cent of serious injury crashes in rural Victoria.

(Name) said that for many years Council has been tackling high crash locations using a range of safety measures. For example, *(give examples of recently completed blackspot or LATM installations).*

This year, Council has implemented a program to review all high risk local rural roads and prioritise those to be treated based on a risk management approach.

Those sites to be improved over the next *(XX)* months are:

- List sites and recommended treatments.

These sites were initially selected due to their high volume of crashes and concerns from local residents.

This will aim to improve the road and road environment at those locations where drivers are most at risk of having a crash.

This approach supports the state-wide adoption of a Safe System approach to road safety in Victoria. The approach combines three key elements to reduce the risk of a fatality: a safe roadside environment, appropriate speeds and safe vehicles. A key criterion of the system is that drivers obey the rules.

Media contact:
(Contact name and details)

News Release 2

Local Roads Improved in *(TOWN / AREA)*

Installation of *(treatment type)* was completed today as part of a Council wide strategy to improve local rural roads outside towns.

Over the past five years *(XX)* crashes had occurred on (road name).

The *(treatment type)* aims to prevent future crashes occurring at that location and reduce the severity any future crashes.

This improvement is part of a Council program to review all high risk local rural roads and prioritise those to be treated based on a risk management approach.

Other sites to be improved over the next *(XX)* months are:

- *List sites and recommended treatments.*

This approach supports the state-wide adoption of a Safe System approach to road safety in Victoria. The approach combines three key elements to reduce the risk of a fatality: a safe roadside environment, appropriate speeds and safe vehicles. A key criterion of the system is that drivers obey the rules.

Include 3-4 paragraphs on details of evaluation

Suggestion: Try to include some information on each location to illustrate that the problem is wide spread.

Media contact:
(Contact name and details)

Implementation Plan

Program name:	
Council name:	
Contact person:	
Contact details of contact person: • e-mail • phone • mail	
Define the problem (crash data): • Locations • Times • Road users • Road conditions etc	
Program objectives:	
Target audience(s):	
Outline 'plan of attack': • Links with state-wide initiatives • Partnerships and role of partners • Advocacy required	
Program implementation: • Implementation timeline for components • Assign responsibilities	
Program evaluation: • Outline how the objectives can be measured	

Approval is given to place this Implementation Plan on the Saferoads website.

❑ yes ❑ no

Final Program report

Program name:	
Year	
Council name:	
Contact person:	
Contact details of contact person: **-** email - phone - mail	
Define the problem (crash data): (provide a summary of the problem) - Locations - Times - Road users - Road conditions etc	
Program objectives:	
Target audience(s):	
Program components: (outline key activities delivered for each component) - Engineering - Education and publicity - Enforcement **-** Other (eg: advocacy)	
Program implementation: **-** Summarise implementation timeline - Role of key partners	
Program evaluation: **-** Measure each program objective - General comments	
Program Cost $:	
Recommendations:	
Future delivery of program: (outline what is planned)	

Please attach supporting materials, where available, including media articles, survey results, pictures of engineering treatments, spreadsheet containing program of works, etc.

Approval is given to place this report on the Saferoads website.

❑ yes ❑ no

Saferoads 'Safer Roads and Roadsides' Countermeasure Package
PRE IMPLEMENTATION SURVEY

Current Road Treatment Program

Does your council have a current program of works based on blackspots or a risk assessment program?

❑ yes

❑ no

What is the average annual expenditure for road safety improvement works on local rural roads within the municipality?

_____

Safe System Approach

Have you heard of the 'Safe System Approach'?
❑ yes

❑ no

Please explain your understanding of the Safe System Approach.

_____
_____
_____

Do you use the Safe System Approach in your work?

❑ yes, please explain

_____
_____
_____
_____

❑ no, please explain

_____
_____
_____
_____

Training

Please indicate how many Council staff has attended any of the following training programs:

❑ Road Safety Engineering Workshop (3 days) - VicRoads

❑ Road Safety Audit Workshop (2 days) - VicRoads

❑ Road Safety Risk Manager training (1 day) - ARRB

Other crash analysis or risk analysis courses

_____
_____
_____

Identifying Treatment Locations

How are locations requiring safety improvements identified?

❑ crash data analysis

❑ review of current blackspots/black lengths

❑ results of road safety audits and/or road safety risk assessments

❑ requests and feedback from the community

❑ consultation with local police

❑ consultation with emergency services

❑ Other – please specify.

Prioritising Treatments

How is candidate road safety projects prioritised in your Council?

_____
_____
_____
_____

What are the key issues in prioritising treatments – eg: influential councillors, available funding?

_____
_____

Has a risk management approach ever been used to prioritise treatments – please explain

_____
_____
_____
_____

Has your Council used the ARRB Road Safety Risk Manager?

❑ yes

Comment _____
_____
_____
___

❑ no

Comment

_____
_____
_____

Treatments Used

What type(s) of engineering improvements are most commonly used by Council to treat intersections?

❑ High skid resistance surfacing

❑ Dedicated right turn lanes

❑ Splitter islands

❑ Roundabouts

❑ Other – please specify_____

What type(s) of engineering improvements are most commonly used by Council to treat run off the road locations?

❑ Safety barriers – please specify type.

❑ Warning signs

❑ Curve alignment markers

❑ Guide posts

Risk Management Approach

Has a risk management approach ever been applied to:

❑ managing the roadside, such as utility poles and tree planting

❑ road maintenance programs and inspections

❑ new road design and construction

❑ Other – please specify.

❑ Line marking

❑ Tactile edge marking

❑ Reduced speed limits

❑ Sealed shoulders

❑ Other – please specify_____

If so, please explain.

_____

_____

_____

Thank you for taking the time to complete the survey

Attachment 5 **Post Implementation Survey**

Saferoads 'Roads and Roadsides' Countermeasure Package
POST IMPLEMENTATION SURVEY

Current Road Treatment Program

Does your council have a current program of works based on blackspots or a risk assessment program?

❑ yes

❑ no

What is the average annual expenditure for road safety improvement works on local rural roads within the municipality?

_____

Safe System Approach

Have you heard of the 'Safe System Approach'?

❑ yes

❑ no

Please explain your understanding of the Safe System Approach.

_____
_____
_____

Do you use the Safe System Approach in your work?

❑ yes, please explain how

_____
_____
_____
_____

❑ no, please explain

_____
_____
_____
_____

Training

Please indicate how many Council staff has attended any of the following training programs:

❑ Road Safety Engineering Workshop (3 days) - VicRoads

❑ Road Safety Audit Workshop (2 days) - VicRoads

❑ Road Safety Risk Manager training (1 day) - ARRB

Other crash analysis or risk analysis courses

_____

_____

_____

Identifying Treatment Locations

How are locations requiring safety improvements identified?

❑ crash data analysis

❑ review of current blackspots/black lengths

❑ results of road safety audits and/or road safety risk assessments

❑ requests and feedback from the community

❑ consultation with local police

❑ consultation with emergency services

❑ Other – please specify.

Prioritising Treatments

How is candidate road safety projects prioritised in your Council?

_____

_____

_____

_____

What are the key issues in prioritising treatments – eg: influential councillors, available funding?

_____

_____

_____

Has a risk management approach ever been used to prioritise treatments – please explain

_____

_____

_____

_____

Has your Council used the ARRB Road Safety Risk Manager?

❑ yes

Comment

_____
_____
_____

❑ no

Comment

_____
_____
_____

Treatments Used

What type(s) of engineering improvements are most commonly used by Council to treat intersections?

❑ High skid resistance surfacing

❑ Dedicated right turn lanes

❑ Splitter islands

❑ Roundabouts

❑ Other – please specify_____

What type(s) of engineering improvements are most commonly used by Council to treat run off the road locations?

❑ Safety barriers – please specify type.

❑ Warning signs

❑ Curve alignment markers

❑ Guide posts

❑ Line marking

❑ Tactile edge marking

❑ Reduced speed limits

❑ Sealed shoulders

❑ Other – please specify _____
_____

Risk Management Approach

Has a risk management approach ever been applied to:

❑ managing the roadside, such as utility poles and tree planting

❑ road maintenance programs and inspections

❑ new road design and construction

❑ Other – please specify.

If so please explain

_____
_____
_____

Thank you for taking the time to complete the survey

Contacts and Further Information

Contacts

1. VicRoads Regional Road Safety Coordinators
2. VicRoads Community Programs Coordinator
3. VicRoads Principal Road Safety Engineer

Resources

Safe System Approach cd

Saferoads 'Safer Urban Environments'
Saferoads 'Is your council at risk?'
Available on the Saferoads website – www.mav.asn.au/saferoads (under 'Programs')

The Road Safety Risk Manager Software Tool: Background Research,
Austroads, AP-R222, 2003.

Websites

www.arrb.com.au

www.arrivealive.vic.gov.au

www.mav.asn.au/saferoads

www.vicroads.vic.gov.au

www.roadsafe.org.au