



Speed management guide

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Foreword from the NZ Transport Agency

I'm pleased to introduce the new *Speed Management Guide*. This is a tool designed to help the Transport Agency and Road Controlling Authorities (RCAs) determine objective road risk, and work with communities to develop speed management approaches to address that risk and meet their needs.

Improving safety and efficiency of our roading network is a critical issue for New Zealand, and the new *Speed Management Guide* will make a significant contribution. It recognises that not all our roads have the same risk. They are unique, often challenging and not always easy to read. Through the use of innovative risk maps and the introduction of new technologies, the Guide allows communities to consider road risk objectively, and to guide robust decision making.

The Guide also places significant weight on engagement and collaboration. It fosters constructive engagement and decision-making with local perspectives in mind, recognising that local people know their roads and have an important part to play in conversations on road risk and speed management.

The Guide fulfils part of the *2012 - 2015 Safer Journeys Action Plan*, which outlines a multi-sector approach to establishing a safe and efficient road system for New Zealanders. Specifically, it sits under the *Safer Speeds Programme*, an initiative that aims to help New Zealanders choose the right speed for the road.

The Guide's core principles are consistency and good community engagement and understanding. It has been tested through the Demonstration Project in Waikato, and is now ready for use across the country.

The Guide received support from across the road safety and transport sector, and was developed alongside RCAs, regional Transport Agency teams, Police and the AA. Thank you all for your efforts.

I urge RCAs to familiarise themselves with the tools within this document. We encourage you to engage with an open mind and move at a pace that is right for your region and communities. Please feel free to contact the Transport Agency if at any stage you require help or information.

There is no quick fix to our road safety challenges, but with the help of this new Guide, I know we can make our roads safer and more efficient for all New Zealanders.

Harry Wilson
Road Safety Director, NZ Transport Agency



Foreword from the NZ Automobile Association

Managing the speeds that people choose to travel on our roads is a balancing act. We want people and goods to be able to move quickly and easily but at speeds that are safe and make sense to people.

Representing our 1.5 million Members who drive, ride, cycle and walk on New Zealand's roads every day the AA has been part of the development of this Speed Management Guide. It is an innovative step forward that will give road controlling authorities better information about what speeds are appropriate for the risks of different roads in their area.

The guide is not calling for sweeping changes. Rather, authorities can use the guide to identify roads where risk and speed are safety issues then consider options they could take to deal with it. In some cases this may mean making changes to reduce speeds while other roads may need upgrading so people can travel safely at the speed limit.

The other great benefit of the guide will be more consistency across the country, which AA Members have wanted for some time.

To reduce deaths and injuries on our roads we need to be smarter in our approach to speed and risk management. Getting people to understand and support this approach will be essential to its success. The AA's 17 District Councils throughout New Zealand can help provide an important road user's perspective and we are looking forward to working with authorities using the guide.

Trevor Follows
AA President



Preface – Speed management and status of Guide

This is the First Edition of the Speed Management Guide, one of the actions in the Safer Journeys *Safer Speeds Programme*. It follows the final working draft which was published in August 2015 and a December 2014 Engagement Draft.

The Speed Management Framework, which is the focal point of the Guide, has been tested and demonstrated, notably in Waikato. The framework has been fine-tuned and is now in good shape to be more widely applied, while the Waikato demonstration project continues.

Another action in the *Safer Speeds Programme* – a programme called “Better Conversations on Road Risk” – is also underway, and complements the roll-out of the Guide. This programme is designed to support Road Controlling Authorities to build a better understanding of current community views and expectations, by providing tools to help them listen and engage more positively about road risk and appropriate approaches to speed management in their areas. In the longer term this will help contribute to a more positive community environment for speed management initiatives.

The Guide should continue to be applied through the existing legal mechanism of Speed Limits New Zealand. However, it is intended that the Setting of Speed Limits Rule is likely to be reviewed in 2017 when the learnings from demonstrating the Speed Management Framework can be considered. Reviewing the Rule is another of the actions in the *Safer Speeds Programme*.

The Guide, which has been developed in association with the sector and the Automobile Association, is underpinned by the following principles:

- Evidence-based
- A nationally consistent approach
- Prioritise high benefit areas that improve both safety and economic productivity, and also areas that will contribute to the credibility of speed management
- Achieve good value for money
- Build better understanding between RCAs and the public for speed management

This is a long-term programme over the next ten years and more. There is no expectation there will be wholesale changes to speed limits in the short-term. This is a Guide for RCAs to manage speed at their own pace, and at a pace that works in their districts and for their communities.

For many roads, no change to travel speeds – or speed limits – will be needed. It is for those corridors where current travel speeds or speed limits may be too low or too high that changes should be made. These are what this Guide describes as high benefit opportunities.

In progressively applying this Guide to speed management, we will see more effective targeting to risk and investment in safety improvements. This will significantly improve the contribution that speed management makes towards the twin objectives of reducing deaths and serious injuries and improving economic productivity, while improving public engagement with speed management activities.

Glossary

<p>Rural (open) vs Urban</p>	<p>For the purpose of this Guide “Urban” and “Rural” may be defined using the Statistics New Zealand classifications, or accepted definitions in regional planning documents (e.g. Auckland’s Metropolitan Urban Limits in the Auckland Plan).</p> <p>For Urban areas sub categories include: – Main Urban Areas, Satellite Urban Communities and Independent Urban Communities.</p> <p>For Rural areas, sub categories include: – Rural Areas with High Urban Influence, Rural Areas with Moderate Urban Influence, Rural Areas with High Low Urban Influence and Highly rural/remote areas.</p> <p>For more information go to: http://www.stats.govt.nz/browse_for_stats/people_and_communities/Geographic_areas/urban-rural-profile/defining-urban-rural-nz.aspx</p> <p>Note that for classifying roads by speed limit, motorways exist in both rural and urban environments.</p> <p>It is recognised that defining Urban and Rural is not always clear cut, particularly in high growth areas undergoing changes in function and use (including land use).</p>
<p>Safe and appropriate speeds</p>	<p>Travel speeds that are appropriate for road function, design, safety and use.</p>
<p>Risk rating (Collective and Personal Risk)</p>	<p>Crash risk is measured as either Collective Risk (or Crash Density) or Personal Risk (or Crash rate). For a full explanation including how they are calculated and risk bands, go to: http://www.kiwirap.org.nz/measures_risk.html See also the High Risk Rural Roads Guide.</p>
<p>Infrastructure Risk Rating (IRR)</p>	<p>A road assessment methodology designed to assess road safety risk based on eight key features. An IRR coding manual is attached as a supplement to this Guide.</p>
<p>Star ratings</p>	<p>A scoring system that rates built-in safety features that have been incorporated into the road’s design. These include wide lanes, shoulders, and safety barriers which are known to reduce the impact and severity of a crash. The safest roads are likely to be straight, divided, have good line-markings, wide lanes and sealed shoulders. Roadsides with no trees or ditches, and roads with few, if any, intersections are also deemed safer. For rural State Highway Star rating categories and examples go to: http://www.kiwirap.org.nz/scoring_bands.html</p>
<p>High benefit opportunities</p>	<p>Opportunities where changes to speed management settings will either reduce serious injury and deaths; improve efficiency; or contribute to the public credibility of speed limits. It means engineering up our economically important roads, lowering speeds on some roads, and making sensible decisions on high risk roads where community and road user support may be variable.</p>

1 Introduction

1.1 OBJECTIVES, SCOPE AND PRIORITIES

1.1.1 Objectives

The objectives of this Speed Management Guide (“this Guide”) are to:

- Ensure a consistent sector-wide approach is adopted to manage speeds so they are appropriate for road function, design, safety, use and the surrounding environment (land use)
- Support Road Controlling Authorities (RCAs) and other system designers identify and prioritise the parts of their networks where better speed management will contribute most to reducing deaths and serious injuries, while supporting overall economic productivity.
- Support RCAs to have better conversations and engagement in their communities, improving community understanding for speed management activities and the concept that not all roads are as safe as each other.

This Guide contains a step by step Speed Management Framework (the Framework) to help RCAs plan, invest in and operate effective speed management planning. It outlines how speed management can achieve both safety and efficiency, and it will enable RCAs to work with their communities to build support for an evidence-based, network-wide strategic approach to achieve these twin outcomes. It will also be of interest to transport stakeholders and people who may have an interest in speed management. For speed management to be successful it must have broad understanding and support.

To ensure this Guide meets the needs of all those involved in speed management, it has been prepared using a collaborative process co-ordinated by the Transport Agency in association with the New Zealand Police, the Ministry of Transport, RCAs (through Trafanz and the RCA Forum) and the Automobile Association.

The Guide is an integral part of the Safer Journeys *Safer Speeds Programme*. The overall goal of the *Safer Speeds Programme*, which sets the direction for speed management in New Zealand, in line with the Government’s Safer Journeys Road Safety Strategy 2010–2020, is to:

Reduce death and serious injuries, and support economic productivity through travel speeds that are safe and appropriate for road function, design, safety and use.

Through the use of this Guide, people will see speed managed consistently, and targeted to risk and high benefit opportunities, which will help build understanding and support for safe and appropriate speeds. *Volume 2* of the Guide contains a comprehensive toolbox of approaches, interventions and technical specification covering all parts of the Safe System. Guidance on how to use the toolbox is also provided.

1.1.2 Scope

The scope of this guide is to:

- Outline a network-wide approach to managing speed, tied in with the One Network Road Classification (ONRC), so that travel speeds are appropriate for road function, design, safety and use.
- Offer guidance for targeting to risk and prioritising investment.
- Outline a Speed Management Framework that encompasses all elements of the Safe System approach to reduce the risk of death and serious injury, while supporting overall economic productivity.
- Provide RCAs with guidance for setting speed limits.
- Identify best-practice and successful case studies, including demonstrations.
- Develop an evaluation framework to track effectiveness, and measure performance.
- Provide insight into current public perceptions about roads, speed and speed limits, and set out some principles to help RCAs engage positively with their communities around speed management.

1.1.3 Priority areas for speed management

Speed management in the broader framework of activity management, is guided by these principles to help with the prioritisation process:

- Plan, invest and manage using a one network approach
- The transport system should move people and goods efficiently and safely
- Investment in the network should be based on a sound business case and offer good value for money
- Users of the transport system should expect levels of service appropriate for the function(s) of the road
- The impact of land use on the transport system needs to be managed, and vice versa.

Speed management is about achieving safe and appropriate speeds that reflect road function, design, safety and use. We need people and goods to move efficiently around our transport network in a way that is aligned to the 'Safe System' approach, and we need to see a reduction in deaths and serious injuries. Speed management requires input from policy makers, engineers, educators and the Police to identify the right speeds for the roads, and involve communities in determining and adopting safe and appropriate speeds.

Speed management should be targeted to two areas:

- Firstly, where there is greatest potential to reduce deaths and serious injuries and improve economic productivity, particularly in the short-term. In both rural and urban environments this is likely to mean a focus on roads which have higher collective crash risk and/or higher personal crash risk. Over the longer-term, clearer categories of safe and appropriate speeds will increase consistency across the network and fully reflect the outcomes and functions of different road types.
- Secondly, where there are high benefit opportunities to improve the credibility of speed limits. These will be corridors where road users already travel at the safe and appropriate speed, but where the posted speed limit is out of alignment.

Using planning tools such as the One Network Road Classification and a better understanding of the various economic and safety considerations in different circumstances, as well as community perspectives and preferences, safe and appropriate speeds can be achieved. The key components that need to be considered as part of speed management activities are shown in Figure 1.1.



Figure 1.1: Key elements to be considered in speed management

1.1.4 The third Safer Journeys Action Plan 2016–2020

The overall direction for speed management continues through the third *Safer Journeys Action Plan*, focusing on achieving greater consistency, better targeting to risk, identifying high benefit opportunities, and growing community understanding and support.

Two specific roads and roadsides initiatives in this Action Plan complement this direction for speed management. These are:

- Develop and implement a national programme of safety improvements on specified highest risk urban arterials that focuses on all modes, but particularly people who walk, or ride a bicycle or a motorcycle.
- Develop and implement a national programme of lower cost safety improvements on higher-risk local rural roads.

These high risk corridors will be identified through the Infrastructure Risk Rating tool and other risk assessment tools, such as SignatureNet and Urban KiwiRAP¹ heat maps for active road users. Many of the routes identified for speed management are likely to overlap with these corridors.

¹ Urban KiwiRAP is a component of New Zealand's KiwiRAP Programme, and is used to analyse the road safety risks of the Local Authority road networks. See <https://roadsafetyrisk.co.nz/kiwi-rap>

1.1.5 Investment approach for speed management

The Transport Agency’s Investment Assessment Framework (IAF) gives effect to the Government Policy Statement. The IAF is underpinned by the Business Case Approach, which is used to guide the planning, investment and project development processes. It is a principles-based approach that clearly links strategy to outcomes, and defines problems and their consequences thoroughly before solutions are considered. This approach ensures a shared view of problems and benefits early in the transport planning process without requiring that the work has to be done in a particular way.

The Speed Management Framework should underpin all planning and investment decisions aimed at reducing risk and improving network efficiency. Speed management planning will outline the highest personal and collective risk routes where there is the greatest risk of death and serious injury, the safe and appropriate speeds for those routes according to their classification and level of risk, and suitable treatments. Speed management plans will feed into Activity Management Plans, Regional Land Transport Plans and ultimately the National Land Transport Programme (NLTP).

1.1.6 The One Network Road Classification

The Speed Management Framework provides a single assessment method² for determining safe and appropriate speeds on New Zealand’s entire road network. This provides an opportunity to better align travelling speeds with road function, design, safety and use because the ONRC takes traffic volumes, freight volumes and place functions into account. Figure 1.2 and Figure 1.3 illustrate the function, classification and typical daily traffic counts for various modes in both urban and rural areas respectively.

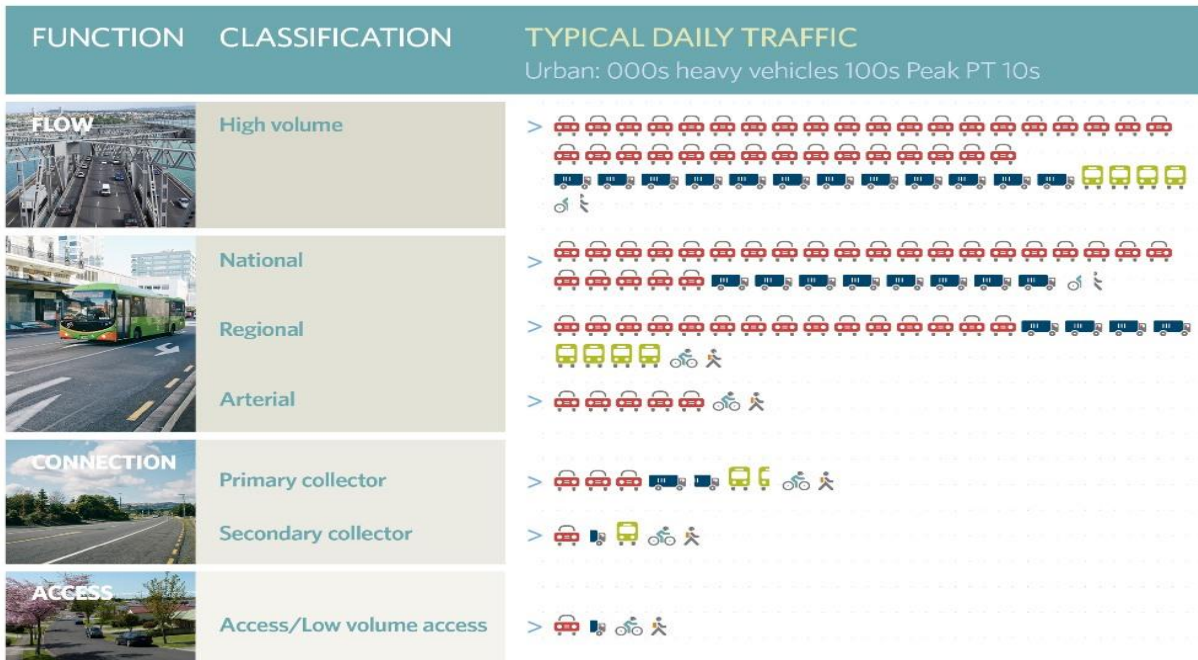


Figure 1.2: Typical ONRC Functions, Classifications and Daily flows for urban areas

² Chapter 4 steps through this in detail.

Classification	Straight open road /urban motorways	Curved open road	Winding open road	Urban (not motorway)
Class 1 High volume national	100–110km/h⁴ Depends on design and safety risk (e.g. divided 4–5 star, grade separated intersections, safety barriers) and factoring in enforcement thresholds		60–80km/h	
Class 2 National, Regional, Arterial	80–100km/h Depends on safety risk and whether volumes justify investment to bring the road up to 3 star equivalent, also enforcement thresholds			50km/h 60–80km/h where safety risk allows, e.g. fewer intersections, mode separation for active users
Class 3 Primary and secondary collector				30–50km/h
Class 4 Access and low-volume access All winding/tortuous	60–80km/h Depending on roadside development, pedestrian and cyclist volumes, whether sealed or not			30km/h if high volumes of cyclists/pedestrians Recognise access and place 10km/h for Shared Spaces

Figure 1.4: Recommended Safe and appropriate speed ranges for Road Classes

⁴ The maximum legal speed limit in New Zealand is 100km/h

2 The Speed Management Framework

This chapter details the key steps in the Speed Management Framework, and illustrates them with worked examples. Figure 2.1 shows the Framework schematically and its three main components:

- How the Transport Agency will use national data sets on ONRC, travel speeds, safety and infrastructure risk to create a draft Speed Management Map for each RCA
- Sense testing and local engagement by RCAs, assisted by the Transport Agency, to refine the draft Speed Management Maps into a proposed set of speed management interventions.
- Incorporating the final set of speed management interventions into Activity Management Plans for the next NLTP.

The key change this Guide signals is to begin with a strategic, one-network based approach and then, by applying a series of techniques, drill down to identify where there is the greatest benefit in addressing misalignment between speed limits, current travel speeds and safe and appropriate travel speeds. The overarching aims are to achieve regionally and nationally consistent outcomes and to prioritise effort and available resources to achieve the highest benefit.

The best outcomes will result if community and stakeholder groups are engaged, kept informed and are part of the process, and support local and regional speed management planning.

2.1 DEVELOPING A DRAFT SPEED MANAGEMENT MAP

The Transport Agency will provide for each RCA (or where appropriate, a region) a draft Speed Management Map of their network, which will:

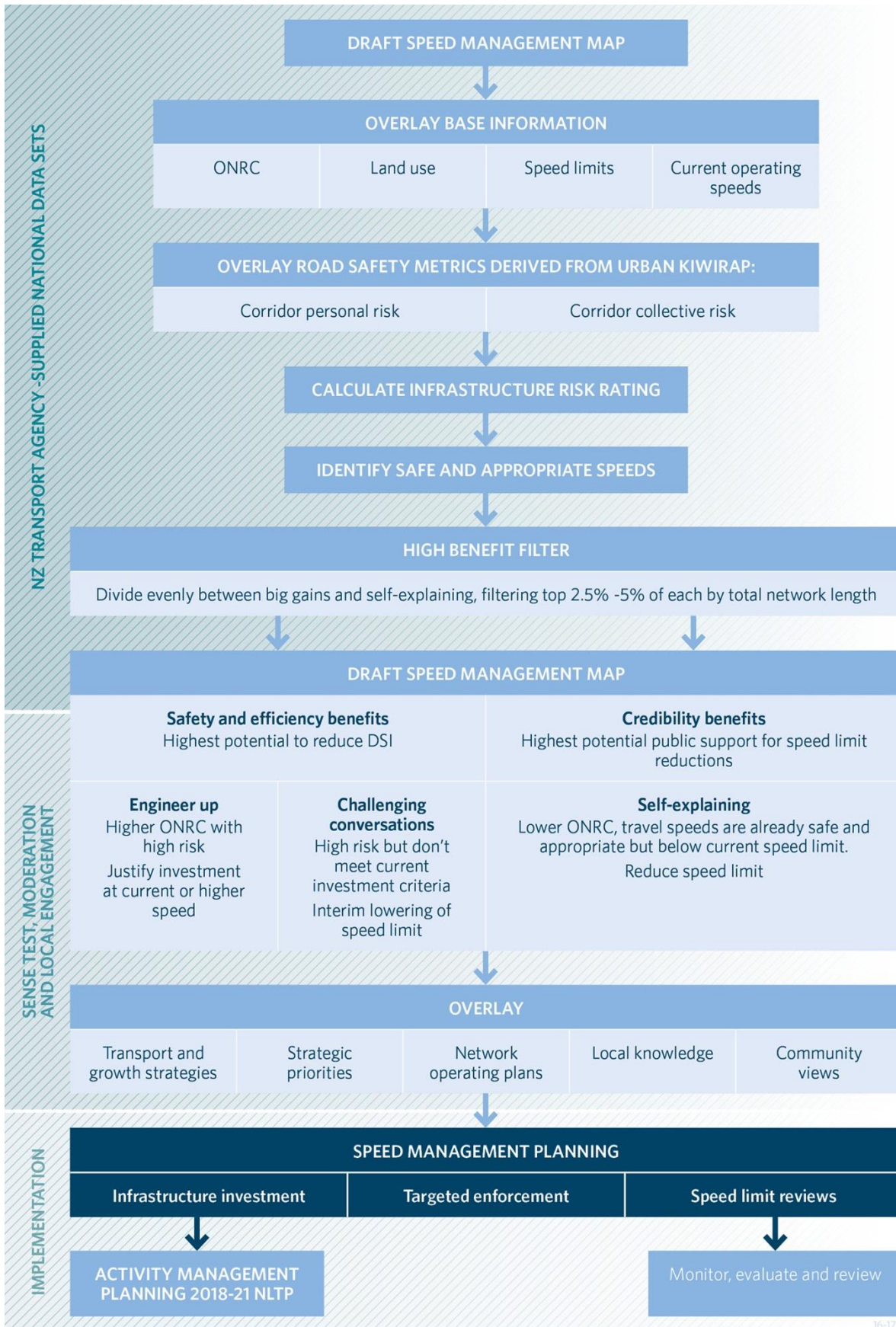
- show where the existing speed limits differ most from the Framework's safe and appropriate speeds
- identify where the greatest benefits from applying speed management will be achieved.

The draft Map will help an RCA to ascertain:

- Where infrastructure improvements should be targeted to improve safety and efficiency.
- Where a review of the speed limits should be considered.
- Where there is high risk, but likely to be 'challenging conversations' with the public and stakeholders, because current travel speeds are not safe or appropriate but this does not self-explain well to communities and road users.
- Lower priority areas, but where action might be required in the future.

The following sections explain how data sets are used to generate a draft Speed Management Map.

Figure 2.1 The Speed Management Framework



2.1.1 Define network area and calculate base information

Overlay ONRC

The first step in developing a draft Speed Management Map is to clearly define its spatial scale and then overlay the ONRC. This provides an opportunity to better align travel speeds with road function because the classification takes traffic volumes, freight volumes and place functions into account as part of an integrated one network approach. The classification helps the Transport Agency and other RCAs to plan, invest in, maintain and operate the network in a strategic, consistent and affordable way.

Land use

Land use is derived from density of residential and commercial developments and helps to define urban and rural boundaries. Land use is a dynamic variable, especially in high-growth areas, such as Auckland.

Understanding the geography of land use in your network area is an important part of aligning the safe and appropriate speed with surrounding environment. This includes walking and cycling activity along and across the road, as well as vehicle movements – parking and driveway manoeuvres and vehicles turning to and from intersections and access ways.

Mapping of speed limits

It is essential to have an up to date record of speed limits on the network. Both posted speed limits and actual travel speeds can then be identified and compared. The Transport Agency is developing a geospatial platform, which will allow a centralised Register of Speed Limits to be created as well as enabling actual travel speeds to be recorded. This will enable trends in both travel speeds and speed limits to be better monitored and progress towards safe and appropriate speeds across the network to be measured.

Mapping of operating/travel speeds

Understanding the actual travel speed of roads in your study area is important for two reasons:

- Through the speed management process the strategy and priority for change can be assessed.
- Baseline data for measuring on-going effectiveness can be obtained before changes are made.

Travel speed data will provide baseline information to show where the biggest differences are between actual speeds, safe and appropriate speeds, and speed limits. They are also useful in establishing how credible a speed limit is with the public. There is now a wider range of data sources for measuring speeds using modern technology⁵.

⁵ There are two key types of actual speed information: **Geospatial speed** measured using in-car GPS information (used for the AA roadwatch site). This is important for measuring the overall and realistic travel speed along a route considering all factors such as alignment, congestion, intersections etc. **Travel time** measured using ANPR, Bluetooth or Wi-Fi surveys. This is not technically a speed measure but it is strongly related to travel speed along a route. This helps to understand the travel time implications of any speed management activity.

In the absence of travel speed data, operating speeds can be simulated in various ways, such as using an Austroads (2009) model, which predicts theoretical operating (85th percentile) speeds for light vehicles on different types of roads, based on real world observations. Travel speed data will be provided to RCAs to complement any existing local monitoring of travel speeds.

The 85th percentile speed and mean speed are normally used to quantify the actual operating speeds on roads and so determine relative risk. However, speed variability and distribution also influence crash risk, so also need to be considered. Risk is reduced when there is low speed variability or distribution.

2.1.2 Identifying the safe and appropriate speed

Road safety metrics

Collective and personal risks along a corridor, which are derived from Urban KiwiRAP, are used in the framework to incorporate crash risk.

Personal risk represents the crash risk exposure to each individual vehicle travelling along a corridor. It is the governing road safety metric in classifying safe and appropriate speeds.

Collective risk is a measure of crash density at a network level and is one of the governing factors in prioritising corridors where speed management is likely to reduce DSIs. This metric is also a secondary factor in classifying safe and appropriate speeds on higher speed rural roads.

Calculate Infrastructure Risk Rating (IRR)

The Transport Agency has developed an Infrastructure Risk Rating (IRR) model⁶. IRR is a predictive road assessment methodology designed to proactively assess road safety risk and is a significant input to the speed management framework.

The road safety risk is assessed by coding each road and roadside feature that feeds into the IRR model so that a risk rating is determined. The Infrastructure Risk Rating model has been refined after the learnings gleaned from applying it in the Waikato Demonstration Project were considered.

IRR utilises the following eight key features that impact on safety risk:

- 1. Road stereotype**
- 2. Alignment**
- 3. Carriageway width**
- 4. Roadside hazards**
- 5. Land use**
- 6. Intersection density**
- 7. Access density**
- 8. Traffic volume**

⁶ The IRR Coding Manual is attached as an appendix to this Guide. It was developed in association with Abley Transportation Consultants.

IRR is assessed by coding the eight influencing factors for each road under consideration. The factors are combined to give an IRR score, which is then classified in five risk categories i.e. 'low', 'low-medium', 'medium', 'medium-high', 'high'.

Classify safe and appropriate speeds

The next step in the process is to combine the IRR score with the collective and personal risk metrics to derive a safe and appropriate travel speed for a corridor. This can be done for the whole network. The **safe and appropriate speed** is based on a speed being appropriate for the road **Function, Design, Safety and Use** (i.e. it takes both safety and efficiency into account).

Tables 2.1 and 2.2 provide a classification method to identify what safe and appropriate speeds should be for different roads in the ONRC. They take into account the road function, safety performance and a suite of factors that impact on safety risk, such as alignment, the nature of roadside hazards and adjacent land use. It is important to stress that it is a long term objective to align both travel speeds and speed limits to road function, design, safety and use. There is no expectation there will be wholesale change in the short-term. Speed management needs to take into account community priorities and concerns, and should happen at a pace that builds and is built on, better public understanding, engagement and support.

Speed management activities need to be prioritised based on their likely impact on reducing deaths and serious injuries while still considering the strategic objectives of the ONRC. For this reason, crash risk within a region or district (whole network, corridor or local area) needs to be understood first.

A draft Speed Management Map will show where it is best to invest in safety improvements to make high risk corridors safer at current travel speeds and where it is more efficient to manage speed down, while also supporting better public engagement in speed management. All options are studied.

The safe and appropriate travel speed for any particular road is derived from the following tables. The criteria specified in the tables apply as follows:

- Starting in the top row of the applicable table (urban or rural), the road section is assessed for meeting all criteria in each of the 'Function / Feature', 'Road Safety' and 'Infrastructure Risk Rating' assessment categories.
- If the road section does not meet one or more of the criteria then the next row and so on is considered until all criteria are satisfied.

Worked examples are provided.

Table 2.1: Proposed Safe and Appropriate Speeds classification method – Urban Roads

Function / Feature	Road safety metric	Infrastructure Risk Rating	Safe and Appropriate Speed (km/h)
<ul style="list-style-type: none"> ONRC is Class 1 or 2 Identified as a Freight Priority Route in a Network Operating Framework Limited Access Road controls Median Divided 	<ul style="list-style-type: none"> Personal Risk ≤ Low-Medium; 	<ul style="list-style-type: none"> 'Low' or 'Low-Medium' 	<ul style="list-style-type: none"> 80
<ul style="list-style-type: none"> ONRC is Class 1 or 2 Non-commercial² adjacent land use 	<ul style="list-style-type: none"> Personal Risk ≤ Medium; 	<ul style="list-style-type: none"> 'Low' or 'Low-Medium' 	<ul style="list-style-type: none"> 60
<ul style="list-style-type: none"> ONRC is Class 1 or 2 Non-commercial² adjacent land use 	No road safety metric used in the assessment	<ul style="list-style-type: none"> Any IRR 	<ul style="list-style-type: none"> 50
<ul style="list-style-type: none"> ONRC is Primary Collector Residential adjacent land use 	<ul style="list-style-type: none"> Personal Risk ≤ Medium-High 	<ul style="list-style-type: none"> Low to Medium 	<ul style="list-style-type: none"> 50
<ul style="list-style-type: none"> Any ONRC Non-commercial and non-residential adjacent land use 	<ul style="list-style-type: none"> Personal Risk ≤ Medium-High 	<ul style="list-style-type: none"> 'Low' to 'Medium' 	<ul style="list-style-type: none"> 50
<ul style="list-style-type: none"> Any ONRC CBD/town centre Residential neighbourhoods 	No road safety metric used in the assessment	<ul style="list-style-type: none"> 'low' to 'Medium-High' 	<ul style="list-style-type: none"> 40
<ul style="list-style-type: none"> Any ONRC CBDs or town centres with high place function and concentration of active road users 	No road safety metric used in the assessment	<ul style="list-style-type: none"> 'High' 	<ul style="list-style-type: none"> 30
<ul style="list-style-type: none"> Parks 	No road safety metric used in the assessment	<ul style="list-style-type: none"> Any rating 	<ul style="list-style-type: none"> 20
<ul style="list-style-type: none"> Shared spaces with high place function and concentration of active road users Car parks 	No road safety metric used in the assessment	<ul style="list-style-type: none"> Any rating 	<ul style="list-style-type: none"> 10

Note 1: HRIG – NZ Transport Agency High-Risk Intersection Guide, 2013

Note 2: Commercial land use excludes Industrial land use activities.

Note 3: No road safety metrics are used in the assessment of roads with a safe and appropriate speed of 40km/h or less, but the corridor's look and feel should be conducive to achieving the safe and appropriate speeds.

Table 2.2 Proposed Safe and Appropriate Speeds classification method – Rural Roads (incl rural towns)

Function / Feature	Road Safety Metric	Infrastructure Risk Rating	Safe and Appropriate Speed (km/h)
<ul style="list-style-type: none"> ONRC is Class 1 Median Divided and at least 2 lanes in each direction No direct property access Grade separated intersections 	<ul style="list-style-type: none"> Personal Risk ≤ Low–Medium; Collective Risk ≤ Medium–High; 	<ul style="list-style-type: none"> 'Low' 	<ul style="list-style-type: none"> 110⁷
<ul style="list-style-type: none"> ONRC is Class 1 – 3 Sealed road 	<ul style="list-style-type: none"> Personal Risk ≤ Medium; Collective Risk ≤ Medium–High; 	<ul style="list-style-type: none"> 'Low' or 'Low–Medium' 	<ul style="list-style-type: none"> 100
<ul style="list-style-type: none"> Any ONRC 	<ul style="list-style-type: none"> Personal Risk ≤ Medium–High; 	<ul style="list-style-type: none"> 'Low' to 'Medium' 	<ul style="list-style-type: none"> 80
<ul style="list-style-type: none"> Any ONRC Not in a rural town² Sealed road 	No road safety metric used in the assessment	<ul style="list-style-type: none"> 'Low' to 'High' 	<ul style="list-style-type: none"> <80
<ul style="list-style-type: none"> Any ONRC Not in a rural town² Unsealed road 	No road safety metric used in the assessment	<ul style="list-style-type: none"> 'Low' to 'High' 	<ul style="list-style-type: none"> <80
<ul style="list-style-type: none"> ONRC is Class 1 – 2 Rural town² 	<ul style="list-style-type: none"> Personal Risk ≤ Low–Medium Collective Risk ≤ Medium–High 	<ul style="list-style-type: none"> 'Low' or 'Low–Medium' 	<ul style="list-style-type: none"> 80
<ul style="list-style-type: none"> ONRC is Class 1 – 3 Rural town² 	<ul style="list-style-type: none"> Personal Risk ≤ Medium 	<ul style="list-style-type: none"> 'Low' to 'Medium' 	<ul style="list-style-type: none"> 60
<ul style="list-style-type: none"> Any ONRC rural town² 	<ul style="list-style-type: none"> Personal Risk ≤ Medium–High, 	<ul style="list-style-type: none"> 'Low' to 'Medium' 	<ul style="list-style-type: none"> 50
<ul style="list-style-type: none"> Rural town² High place function and concentration of active road users 	No road safety metric used in the assessment	<ul style="list-style-type: none"> 'Low' to 'Medium–High' Or 'High' 	<ul style="list-style-type: none"> <50

Note 1: HRIG – NZ Transport Agency High-Risk Intersection Guide, 2013

Note 2: Not classified as Urban according to Statistics New Zealand definition.

⁷ Several sections of the Roads of National Significance would safely support travel speeds of up to 110km/h. Setting limits higher than 100km/h is currently not permitted, but a change to the law (Land Transport Rule: Setting of Speed Limits,2003) is under consideration.

Variable speed limits have been used at urban schools for some time. More recently a number of successful trials of rural variable speed limits have been carried out around rural schools and high risk intersections, and are in various stages of implementation. Table 2.3 outlines where different variable speed limits should be used:

Table 2.3 Variable speed limits

Variable Speed limit	Conditions for use
60–70 ⁸	Where a vehicle side impact risk exists, but where the risk is not continuous. Typically this would be at high risk intersections, activated by potentially conflicting traffic (using the <i>High Risk Intersection Guide</i>) or at rural schools activated during commuting times (using the <i>Safer Journeys to School Guide</i>).
40	Where a significant pedestrian risk exists, but where the risk is not continuous. Currently the only applications of this option are at urban and rural schools (See Traffic Note 37). Future applications may include town centres (potentially 30 km/h) using a Network Operating Plan.

Table 2.4 Interim speed limits

Interim Speed limit	Conditions for use
70 and 90 ⁹	<p>The tables above do not include permanent 70km/h or 90km/h speed limits as these are interim interventions where:</p> <ul style="list-style-type: none"> • The crash risk is sufficiently high to justify a temporary change in the speed limit until safety improvements or perceptual countermeasures can be made. • Investment cannot be justified and if existing speeds are sufficiently high that a drop to 80km/h (from 100) or to 60km/h (from 80) cannot be practically achieved in the short-term. <p>70km/h and 90km/h speed limits are interim interventions only because:</p> <ul style="list-style-type: none"> • At higher travel speeds, people have trouble differentiating speed limit differences of just 10km/h. The advantage of using 20 km/h increments between 60 and 100 km/h are that fewer and more recognisable speed categories are easier for people to understand and recall¹⁰. This should mean less need for speed limit changes and repeater signs. • We need to create a more consistent and intuitive speed management system across the whole network, where people have a greater understanding and appreciation of risk than is manifest at present and there is a greater differentiation between levels of the speed limit hierarchy. Countries which have fewer speed limit options tend to have a greater differentiation of road environments than New Zealand.

⁸ These require specific approval by the Transport Agency

⁹ A 90km/h speed limit requires specific approval by the Transport Agency

2.1.3 Applying a high benefit filter to create a draft speed management map

Once all the data sets described above have been compiled and mapped, the next stage in the process is to create a draft speed management map, which identifies for each RCA where the highest benefit opportunities lie to manage speed on their networks. It will then be up to RCAs to test the pace and appetite for change at the community, stakeholder and political levels. We anticipate that change will be gradual, at a pace that is underpinned by community support and understanding. An example of a draft speed management map is shown in Figure 2.2.

For many parts of the network, current travel speeds and/or speed limits will be suitable for the function, design and use. The focus is on corridors and network areas where current travel speeds may be too high or too low for the function, design, and use, which typically manifest as poor road safety performance.

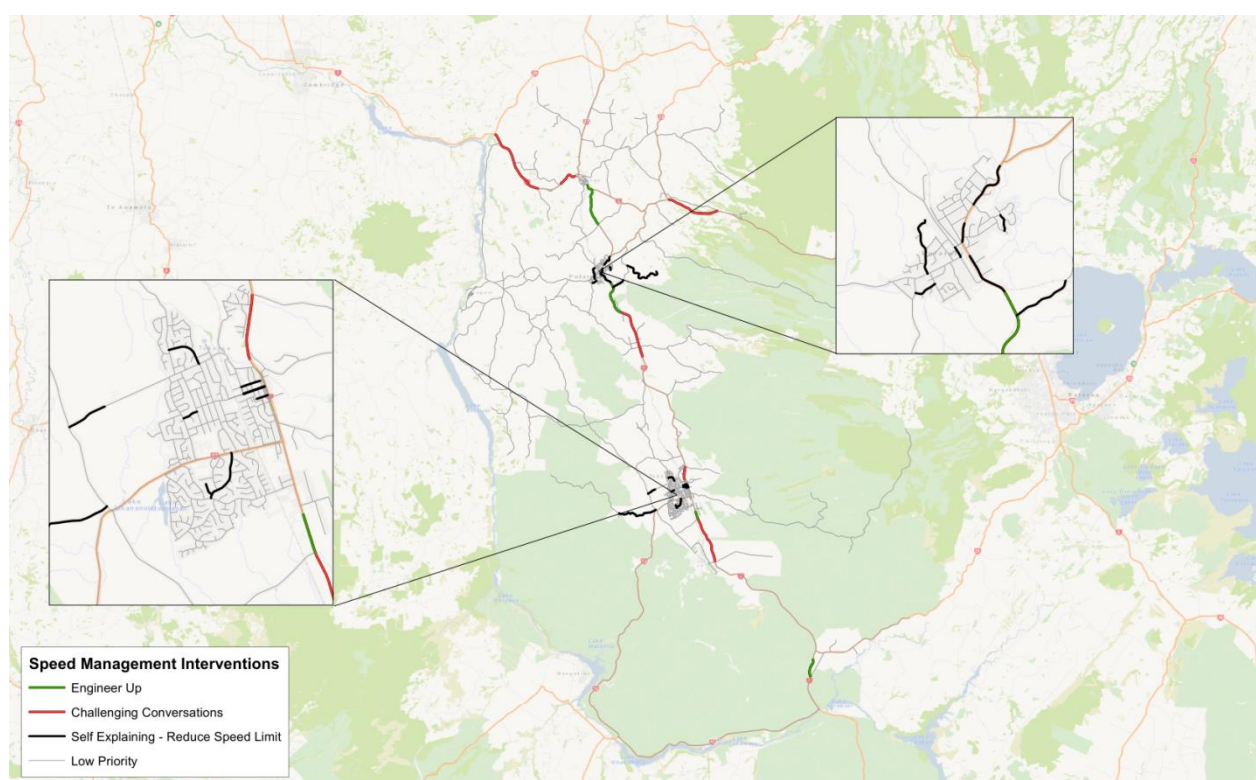


Figure 2.2 An example of a draft speed management map. Source: Ableys, 2015

A draft speed management map produces three types of interventions for RCAs to consider, “**engineer up**”, “**challenging conversations**” and “**self-explaining**”. High-risk corridors that satisfy the investment criteria are prioritised as “engineer up”; other high risk corridors, that do not satisfy the investment criteria, are “challenging conversations”. These high-risk corridors are capped at 2.5% of the network length. Then the top 2.5% self-explaining opportunities are identified separately by network length. This produces a draft speed management map covering 5% of your network. The process is then repeated for the next 2.5% slice of each category to produce a map covering 10% of the network.

The reason for this division is to support both a reduction in DSI and to support greater credibility for speed management and contribute to better public engagement. It thus addresses both high risk and high benefit opportunities. Both 5% and 10% maps are provided to enable RCAs to plan ahead and at a pace that is understood and accepted by road users, stakeholders and communities.

2.1.4 “Engineer up”

These are economically important roads where the safety performance is poor and there is a strong case for investment to bring the corridor up to the required standard to support existing or higher travel speeds. Travel speeds will tend to be close to the existing speed limit, or possibly higher.

Case study 1 Waikato Expressway – Example 1 Ngaruawahia Section

The problem

State Highway 1 into Ngaruawahia was previously an undivided highway with high traffic volumes, significant roadside hazards and at grade intersections resulting in a high crash rate (Figure 4.5).



Figure 2.3: State Highway 1 Approaching Ngaruawahia

The approach

This is a crucial piece of infrastructure for Waikato and New Zealand, as it is central to providing safer and more efficient transport links between the business and freight hubs of Hamilton, Auckland and Tauranga. The Ngaruawahia project formed part of the larger Waikato Expressway programme of work, which is one of seven roads of national significance for New Zealand.

The Ngaruawahia section of the expressway was completed in December 2013 and now enables SH1 to bypass the road into Ngaruawahia Township. The new section is a 5 star road with median separation and wire rope barriers. There are also grade separated intersections and safe roadsides (Figure 4.6).



Figure 2.4: State Highway 1 Waikato Expressway near Ngaruawahia

Outcomes and Learnings

The safety improvements on the new section of SH1 are significant compared to the previous route into Ngaruawahia, however, under a default speed limit of 100km/h both roads currently have the same speed limit. Utilising the method outlined in this guide, it is possible that this section of SH1 could be considered for a posted speed limit of 110km/h.

2.1.5 “Challenging conversations”

These are corridors where current travel speeds and the speed limit are above the calculated safe and appropriate speed and the safety performance is poor. However, in these instances, the criterion for engineering up is not satisfied, even though the safety performance justifies some sort of intervention. In these instances road users are travelling too fast for the safety conditions on the corridor and the intervention may require a lowering of the current speed limit, either permanently or on an interim basis until investment can be justified, or the safety performance improves. These are defined as “challenging conversations” because discussions around lowering limits can often be challenging, and RCAs need to be prepared for careful and sometimes extended community engagement and consultation.

Case study 2 Road to Hobbiton

The Problem:

Navigation aids show Buckland Road and Puketutu Roads as the shortest route from SH1 to the Hobbiton Movie Set, a tourist attraction with approximately 500,000 visitors per year. This secondary collector road is administered by two RCAs. In the past five years there have been 27 crashes including two serious injury crashes. The majority were single vehicle loss of control crashes. The route has poor geometry, and narrow carriageway width in some locations makes the route difficult to safely negotiate for larger vehicles including buses and campervans. The route has inconsistent approaches to signage and markings, e.g. parts of the route include edge marker posts and edge lines while in other areas only a centreline is marked. The speed limit is 100km/h and 85th percentile travel speeds vary from 63km/h to 81km/h.



The site was identified for inclusion in the Waikato demonstration project because it provided a self-explaining rural route with a high proportion of visitors using it who may not be used to driving on narrow, rural roads. In addition, due to navigation aids this road is shown as the preferred route for visitors to Hobbiton. In fact, the better route is via SH1 and SH29 which is 7km longer than travelling via Buckland Road, but on roads that are better suited to heavy traffic and visiting drivers. The site would also provide an opportunity to identify how cross-boundary issues could be managed.

The recommended safe and appropriate speed based on the analysis was 60km/h west of Hobbiton and from 100km/h to 80km/h on the remainder of the route (currently all set at 100 km/h).

Outcome and Learnings:

It was agreed to carry out early engagement to obtain community feedback on the proposed changes, and to identify whether community expectations aligned with the assessment of the Speed Management Guide.

This was different to the existing process for changing speed limits, with more extensive community engagement undertaken to inform Council prior to their decision whether to proceed with a bylaw change. In addition to targeted media releases, there was a mail-box drop, a drop-in session, social media, newspaper advertisements promoting the engagement period, and an online survey. These were useful in learning community perspectives in this area.

Based on this community engagement, it was evident that speed was not perceived by local road users to be the most significant issue on this road. The concerns expressed were about visiting drivers being misdirected by navigation aids; not enough signage to direct visitors on the preferred route; and inconsistencies in road marking. Local people felt that if visiting drivers used the longer route via SH1 and SH29, they and the roads would be safer, without the need for speed limit changes.

Inconsistencies in signs and markings along the corridor should be reviewed against the current ONRC of secondary collector. It is considered appropriate to review the ONRC to ensure it is appropriate for the function of the route. A recommendation was therefore made to the project Governance Group not to proceed with a speed limit change but to work with the respective road controlling authorities and to explore signage, GPS systems and road markings.

2.1.6 “Self-explaining”

These are corridors where the posted speed limit is higher than the safe and appropriate speed, but where road users are already travelling at the safe and appropriate speed. These are high benefit opportunities because lowering the speed limit will be self-explanatory and credible to road users. This helps to improve community understanding of safe and appropriate speeds, and improves the credibility of speed limit settings. It also helps to explain roads better to visiting drivers.

Case study 3 Te Awamutu town centre



The Problem:

Alexandra Street in Te Awamutu is a commercial zone with busy pedestrian frontages. There is a lot of on-street parking and pedestrian activity with regular pedestrian crossing points. The traffic volume is 11,000 vehicles/day with a high proportion of heavy vehicles including dairy tankers. The speed limit through the CBD is 50km/h. There were 57 crashes in the area over five years including four serious injury, 12 minor injury and 41 non-injury crashes.

The approach:

The site was identified for inclusion in the Waikato demonstration project because it provided an example of an urban area with high interaction between land use and transport. The current 85th percentile travel speeds generally match the Safe and Appropriate Speed (SAAS), both of which are lower than the posted speed limit.

The recommended speed based on technical analysis was a self-explaining reduction in speed limit from 50km/h to 40km/h in line with the SAAS. This reduction would not have a negative impact on the local community, who are generally already travelling at that speed, and would provide better guidance for visitors travelling in this area.

Outcome and Learnings:

Early engagement was carried out to obtain community feedback on the proposed changes, and to check if community expectations aligned with the assessment of the Speed Management Guide.

This was a different approach to the existing process for changing speed limits, in that more extensive and comprehensive community engagement was undertaken to inform Council’s decision

whether to proceed with a bylaw change. In addition to targeted media releases, there was a mail-box drop, a drop-in session at a local cafe, social media, advertisements promoting the engagement period, and an online survey.

In addition a Health Impact Assessment was completed by the Waikato District Health Board to determine, from a community perspective, any intended or unintended consequences on social health and wellbeing of a proposal to reduce speed in the CBD area. This included workshops to gather views from groups who may not usually respond to such consultation, and included two local schools, Enrich+, Chamber of Commerce, and residents from a local retirement home. The feedback from these workshops was overwhelmingly in support of a reduction in speed limit from 50km/h to 40km/h.

When the results of the community engagement together with the completed findings from the Health Impact Assessment were presented to the Waipa District Council, they chose to proceed to a formal consultation to reduce the speed limit to 40km/h.

3 Sense testing your draft Speed Management Map

3.1 TECHNICAL CHECK

This is a key phase in the development of your speed management planning. **RCAs will be provided with a draft speed management map which will form the basis firstly for a technical check to ensure accuracy** (e.g. is the ONRC and speed limit data current and up to date?).

The draft Speed Management Maps are based on an automated IRR process which incorporates assumptions regarding roadside hazards and access density. These attributes should be checked for corridors that are prioritised by undertaking desktop reviews or site visits. It is also important to consider why a particular corridor is not in alignment with the framework. For example, if a corridor has a safe and appropriate speed that is lower than the posted speed limit based on personal risk alone, then safety measures other than speed management may be more appropriate. Corridors that are not in alignment with the framework due to ONRC or IRR are more suitable for speed management interventions. This technical check should also involve the Transport Agency's State highway teams so that speed management planning is developed from a one-network perspective.

3.2 PLANNING CHECK

Understanding your road network is an important step in managing speed. This means understanding higher level planning considerations and the strategic nature of the various routes using the ONRC. High strategic routes for freight and other purposes are likely to require a different approach to speed management than minor routes with less strategic priority.

For local rural and urban roads, **District Plans and City Plans** also provide guidance on road types and their functions within an RCA's jurisdiction. In complex urban environments, classifying corridors that change in function, use and appearance along their length (as many arterials do) can be problematic. Network Operating Planning can help identify priority corridors for different modes and the appropriate levels of service, including speed management.

Likewise, peri-urban areas experiencing rapid growth can also be a challenge. Through sense testing a draft Speed Management Map an RCA can identify and work through these issues and ensure effective engagement with their community.

In urban areas, mixed use arterial corridors should be a focus for managing speeds as they account for a high proportion of deaths and serious injuries, particularly at intersections and particularly for active road users. It is not always possible to separate modes on these busy corridors. Pedestrians and cyclists may travel on corridors which have a high level of personal risk. This should be taken into account, particularly if those corridors are part of a strategic cycling or walking network.

3.3 TYPE OF INTERVENTION CHECK

In practice, on strategically important open roads with high traffic or freight volumes, high safety ratings (i.e. low risk), and on high volume urban routes, consistent and homogeneous speeds support both safety and network efficiency. Designing and engineering these corridors to reduce risk and support higher speeds is more likely to be an effective way to improve travel time reliability.

On these corridors, network efficiency objectives would be identified and taken into account. On corridors that are high risk, and where excess speed is identified as a contributing cause, enforcement and road user education will also play an important role, in the interim at least, and should be integrated into planning.

In some cases, where there is strong case for investment to improve safety and efficiency but for which funding is not yet available, an interim lowering of the speed limit may be the appropriate response to lower the level of risk. It is important that RCAs clearly communicate that these roads will be improved when investment is available, and to give some indication of when this is likely to happen.

On less strategically important roads that have a high risk, or on low volume urban roads with high risk, lower traffic volumes mean that high cost engineering treatments will be difficult to justify. Safety can be improved through lower cost measures, which may include corridor or area speed limit reviews. They are an effective way to communicate risk to road users and support broader objectives related to access and place and establish self-explanatory speed environments where people understand the safe and appropriate speed that they should travel on those types of roads¹¹. The framework sets the envelope for speed limits in these situations.

As well as speed limit reviews, safety treatments include low cost advisory signs, threshold treatments, or perceptual treatments, combined with improving access for people who walk and cycle. Enforcement on high collective or personal risk routes can also be factored in.

Speed management should be targeted where there is greatest potential to reduce deaths and serious injuries, as well as to improve efficiency, and communicate to road users that not all roads are equal. Over the longer-term, clearer differentiation for safe and appropriate speeds will increase consistency across the network.

Once these checks have been completed, the next phase in the process is local engagement with key stakeholders and involving the Transport Agency's Planning and Investment staff.

¹¹ Examples include residential areas in Hamilton and in Newtown, Wellington.

4 Engagement

Gaining community engagement in and support for speed management initiatives is crucial. Without this support, speed management initiatives can often fail, and community input improves speed management outcomes and effectiveness.

This section of the guide is designed to help RCAs to have better conversations in their communities, and improve community engagement with speed management activities.

It also sets out some of the tools and support that is available to RCAs through the “Better Conversations on Road Risk” programme.

4.1 GETTING STARTED

It is important at the start of the process to determine and establish key roles, responsibilities and accountabilities and how you will engage with your communities, including how you will measure people’s understanding and support.

It is important to allow enough time to explore community perceptions and reflect those perceptions into your engagement and speed management planning.

Engaging early and effectively with your communities and key stakeholders needs to be planned for, in order to:

- understand their perspectives, attitudes and behaviours about speed and in particular speeding, and their perspectives about risk on the roads you are investigating
- gauge the level of understanding and support for what you wish to achieve
- foster good relationships while developing and implementing your speed management plan
- help develop a workable speed management plan that will be accepted by the community

It’s important to be open and transparent about what you want to achieve and how your communities can help, and to keep your communities informed throughout the process.

4.1.1 Some principles for positive engagement

With good engagement and consistent messages, RCAs can contribute to a more balanced public conversation where all voices are heard and perspectives are more informed.

The Transport Agency has recently reviewed some examples of successful engagement in communities around New Zealand, to create the following principles for positive engagement (Figure 4.1). These principles underpinned the approach taken to engagement in the Waikato region demonstration sites. In Te Awamutu planning started early and the engagement team got out there and told the stories. In Hobbiton the team engaged early and they also listened to the community’s feedback so they got the messages right.



Figure 4.1 Principles for powerful engagement

Principle	What this means
Lay the groundwork, and take your time	<ul style="list-style-type: none"> • Plan. Don't rush and you'll see the benefits • Think about who you need to speak with to make sure you connect with the right people right away • Map out your milestones. This will help you identify opportunities to engage and interact with your community, including local media • Anticipate your community's concerns before you engage. This will make it easier to respond in an open, clear and direct way • Be clear about why it's important to engage with your community, and how it can help
Listen, really listen	<ul style="list-style-type: none"> • Put your ear to the ground – find out what's going on in your organisation, analyse media coverage, conduct community research, and build an understanding of your community before you • Pay close attention to what your community is saying to better understand their concerns • Demonstrate you've really listened by adapting your programme to reflect their views and show them what you've done
Engage many voices	<ul style="list-style-type: none"> • Generate interest and support for your proposal by sharing messages and communications widely and in a variety of ways • Identify and train your spokespeople to be 'advocates' for your programme • Try to be the first person to spread any news about your programme
Get out there, tell the story	<ul style="list-style-type: none"> • Talk, and talk some more. Don't walk away from tough conversations • Help the media tell your story by working with, and regularly updating, them • Go where the people are and make it easy for them to come to you e.g. hold community meetings, drop-in sessions or knock on doors • Connect in a way that is suitable for the audience you're trying to engage e.g. social media for younger people, flyers at the library for older people • Tell the right story to the right audience and in a timely way, e.g. if it's about a residential road, focus on the residents and give them time to think • Keep it simple: use clear messages, provide strong, neutral facts, use plain English to explain your proposals, steer clear of jargon
Keep it up	<ul style="list-style-type: none"> • Engagement can be the difference between success and failure. So, start engaging well before you begin to consult, and keep it going throughout • Seek out and include a range of views. This could lead to solutions you might not otherwise consider

4.2 TOOLS TO SUPPORT ENGAGEMENT

The Better Conversations on Road Risk programme is designed to help create a more positive public conversation about speed and road safety, and to contribute to a more supportive environment for discussions about speed management initiatives.

The programme has a number of elements designed to measure, engage in and influence the conversation people are having around speed.

The programme has a number of tools and templates that RCAs can use.

4.2.1 Research tools

The Transport Agency has recently conducted qualitative and quantitative research into public perspectives about speed, speeding and road safety.

A summary of that research, including some regional data, is available to RCAs.

The Agency has also developed a tool for reviewing the way news media treat speed and road safety, to understand how media coverage contribute to the conversation on speed in a community.

This public research and media analysis can be replicated in any region, to help RCAs plan engagement that will respond to the current conversation in their region, and engage positively. To find out more how to do this, contact conversationsonspeed@nzta.govt.nz

4.2.2 Engagement tools

Through the Better Conversations on Road Risk programme, the Transport Agency is working with Police, ACC, the Ministry of Transport and the AA to create some tools to support positive conversations about speed and speed management. RCAs can access these tools to support their engagement with communities and stakeholders in relation to speed management interventions.

These include:

Engagement companion. This sets out the principles for successfully engaging with communities. It includes lessons from engagement around New Zealand, and can help in planning and implementing good engagement about speed management changes in your community.

“A new better conversations on road risk” programme toolkit. This will help RCAs have balanced and informed conversations about speed. It includes key messages and important facts – and tips for how and when to use. It also includes an outline of who else is talking about speed, and their contact details.

“A new better conversation on road risk” programme updates. These email updates will include information about how the public is currently talking about speed, updates on effective messaging, and information and case studies about what other communities are doing. To sign up for this email update, [-conversationsonspeed@nzta.govt.nz](mailto:conversationsonspeed@nzta.govt.nz)

Media engagement template. This is a framework for engaging with the media. It provides guidance on what information journalists might need, good times to call them, suggested angles for stories and other tips for working with media.

5 Prioritise and Programme Action

5.1 PRIORITISING ACTIONS

Generally speaking, **priority** for speed management activities will be on parts of the network where:

- there is a large differential between actual travel speeds, and safe and appropriate speeds
- there is a high personal or particularly collective crash risk within a network area
- speed management will make a difference
- there are high benefit opportunities to align the posted speed limit with the self-explaining nature of the corridor.

The nature of the speed management intervention depends on the road category within which each road sits and the level of risk that exists for the road (refer to the Toolbox in *Volume Two* of this Guide). For example, a high strategic corridor would warrant infrastructure investment to maintain higher travel speeds, whereas a high priority lower category area may be best suited to speed limit changes and further education and enforcement. The broad approaches that should be taken for different types of networks are presented in Table 5.1 below.

Speed maintained or increases	Speed reduction
Where high strategic fit (via ONRC)	Lower strategic fit (via ONRC)
Engineering improvements (e.g. shoulder widening, barriers, curve alignments, surface improvements, intersection treatments)	Lower cost perceptual countermeasures to support lower speeds
Signs and other communication to indicate priority route	Appropriate road user behaviour
May need interim speed limit reduction if funding needed to meet infrastructure works (e.g. interim 90 km/h on open road)	Speed limit appropriate for the road
	Variable speed limits to improve flow on congested high volume roads.

Table 5.1 Treatments with highest potential to reduce Deaths and Serious injuries

On lower volume networks where personal risk is high and collective risk is low it may be better to consider low cost speed management measures such as road markings, signs and communication (having better conversations around speed and road risk) where the focus is more likely to be on safety and raising awareness of risk and where efficiency is less important.

On higher volume corridors with high collective risk and low personal risk, the focus is more likely to be on improving the road to make it safer and more efficient at current or higher travel speeds. In these cases the corridor may need investment and upgrade so that it reflects safe system practices, such as median and side barriers and grade separated intersections.

On straighter roads, enforcement continues to be important in reducing excess speeds and death and serious injury, especially on routes with high collective or personal risk.

5.2 PROGRAMMING ACTIONS

Programming is another key point in your engagement plan, where you should be testing your network proposals with stakeholders and your community. A critical part of this is sharing the information, data and analysis; outlining short, medium and long-term objectives; and in particular how your proposals will contribute to **both** the safety **and** efficiency of your network. Your Speed Management Plan should be an integral part of your Activity Management Plans (AMPs), road safety action planning and Regional Land Transport Plan.

The guide provides the framework to enable a consistent approach, but it is up to each RCA, along with discussions with their neighbouring RCAs and the Transport Agency to determine the pace of change across their networks. For some this may mean significant investment in safety infrastructure on high volume strategically important routes. For others it may mean a drop in the posted speed limit on high risk areas of their network, supplemented by low cost treatments.

It is not anticipated that there will be a significant increase in the number of speed management interventions implemented (including speed limit changes). However, we do expect to see a more targeted approach to address the highest benefit opportunities in order.

A robust business case should be part of your speed management planning to ensure value for money from each dollar invested. A business case approach is now embedded in the Transport Agency's Investment Assessment Framework for the National Land Transport Fund. Programmes that are developed using this Guide and tested through a business case approach are likely to support a stronger case for investment than those which do not.

5.3 MEASURING PERFORMANCE – EVALUATION FRAMEWORK FOR SPEED MANAGEMENT

Evaluation of speed management activities ensures information is captured to measure progress and value. This practical evaluation framework focusses on monitoring and evaluating speed management activities at an individual project and/or regional level. However, it can also be used to develop a consistent approach across regions so activities can be evaluated nationally too.

Monitoring and evaluation of speed management activities is essential for:

- tracking progress towards key performance indicators (KPI's)
- communicating progress and effectiveness to policy makers, local authorities and the wider public.
- demonstrating accountability for investment
- identifying areas for remedial action during the implementation stage
- identifying outcomes which were not intended (either positive or negative)
- measuring the effectiveness of new approaches that contribute to the knowledge base

The key measures of success we want to see progress on are that:

- Speed management as a whole becomes more consistent and prioritised to risk, and road users see the same types of risks consistently identified and targeted no matter who manages the road network.
- Travel speeds will align to the framework over time, and become more appropriate for road function, design, safety and use, starting with the highest risk routes to build public understanding and support.
- Mean speeds will moderate on lower classification or less safe roads. Deaths and serious injuries will reduce, while economic productivity is maintained or enhanced across the road system overall.
- The road system as a whole will become more self-explaining and consistent over time, and speed management will be more credible to the public.

Monitoring and evaluation are on-going processes to integrate into all project stages including:

at the beginning (checking programme logic and design along with baseline data collection),

during (process, implementation and monitoring evaluation) and;

at the end of the project or following implementation (outcome evaluation).

Although monitoring and evaluation may use similar data sources, they are different:

Monitoring involves assessing progress and collecting information before, during and after a project

Evaluation shows the effectiveness of speed management activities already implemented, using monitoring and other data. It also critically analyses the merit or worth of the activities

It is important early on to identify and agree who will carry out both monitoring and evaluation activities, when these activities will occur, and the kind of data and level of evidence needed for the

particular project or speed management activity. Having KPIs ensures progress is tracked, and ‘success’ clearly defined.

5.3.1 How to monitor and evaluate

A logic model is a good starting point to show the key aspects of speed management that should be considered for evaluation. Once the logic or rationale has been established, the detail of how specific items should be measured can be considered. The following two tables present the implementation and outcome measures separately.

Evaluating the implementation of Speed Management activities

Indicator	Description/Rationale	How to measure/key considerations
Number and type of Speed Management Activities Implemented	Identify the frequency of implementation for different types of speed management, e.g. engineering, speed limit, enforcement	Documented in various RCA reporting requirements A single speed management Activity Log is required. When? As activities are planned and implemented
Consistency and quality of speed management activities	The quality of Speed Management activities and alignment with the Guide	Should be carried out via independent audit process. When? During planning and after initiatives are implemented
Dollar Invested on speed management activities	A measure of investment in speed management e.g. proportion of regional spend and from which budget (i.e. safety budget, operational, maintenance)?	Part of RCA speed management Activity Log Through NLTP programmes When? budgeted (before) and Actual (after)
Barriers to implementation	Provides data if speed management activities were not implemented as planned (e.g. public resistance, lack of resources). Can also be used to plan for risk ahead of activities	Part of RCA speed management Activity Log When? Both before and after implementation
% of network with Safe and Appropriate speed limits	Regional or district proportions of the network with limits that align to the national framework – a measure of national consistency and credibility	When? Yearly as part of Activity Log
Extent of engagement	The extent of engagement activities and the number of people reached through engagement	Part of engagement and consultation processes When? Throughout

Evaluating the outcomes of speed management activities

Indicator	Description	How to measure/key considerations
Speed		
Point speeds	Mean, 85 th Percentile, Speed distribution	Tube counters, radar or induction loops at key locations When? Before and after speed management activities to measure change
Geospatial speeds	In-car GPS derived speeds, can be accessed through national database	This method is still being developed for national use When? Before and after speed management activities to measure change
Difference between posted and mean speeds	Compare point speed with the planned or changed posted speed limit. Mean speed should match posted speed and 85% speed should be within 10% of the posted speed	Analysis using data already collected When? Immediately after speed management changes and 6–12 months following.
Traffic Efficiency		
Traffic volumes	Traffic volume should be measured as Annual Average Daily Traffic (AADT), the two-way daily traffic that passes a point (e.g. 10,000 vehicles per day)	Tube counters, radar or induction loops at key locations When? Before and after speed management activities to measure change. Most RCAs have on-going measurement databases for this
Travel times	The time it takes traffic to travel between locations	This method is being developed for national use. At specific locations travel times can be measured using GPS, ANPR or Wi-Fi surveys. When? Before and after speed management activities to measure change
Level of service	A description of the road quality based on a framework of important items (e.g. KiwiRAP)	Crucial for speed setting process in the Guide. When? As part of the speed management process and should be measured afterwards
Perceptions & Behaviour		
Awareness of speed management activities	Awareness of speed limit change or engineering	Focus groups and/or surveys with local residents or road users via meeting, mail or online When? Before and after
Perceptions of speed management activities	Perceived effectiveness, compliance and likelihood of enforcement; level of support	Focus groups and/or surveys with local residents or road users via meeting, mail or online When? Before and after

Indicator	Description	How to measure/key considerations
Other road user counts and latent demand	Numbers of cyclists or pedestrians using the road. Latent demand means that more cyclists or pedestrians might use the road if conditions were different.	This is important because speed management activities have impacts (positive or negative) on other road users. Estimate latent demand via surveys, destination audits and school/workplace travel surveys When? Should be carried out for all urban activities.
Road User Behaviour	Behaviour of other road users, such as pedestrians and cyclists	Pre-post observation of pedestrian and cyclist behaviour. Gains an understanding of how 'user friendly' road environments are for walkers and cyclists. Very important in urban areas. Usually by direct observation or video. When? Should be carried out before and after all urban speed management activities.
Crashes, deaths and injuries		
Speed-related crashes	Injury crashes where speeding or travelling too fast for the conditions has contributed.	When? Before and after all speed related all speed management activities using established crash databases (i.e. CAS and reports from CAS)
Crash data	Analysis of all crashes on network, by F,S,M and non-injury	When? Before and after all speed related all speed management activities using established crash databases (i.e. CAS and reports from CAS)