I   Continuous improvement monitoring workbook

Content

I.1   Introduction

A safety management system (SMS):

- is a method for managing the road network to improve safety

- documents road safety strategies, policies, standards, procedures, staff expertise, management and audit systems of the road controlling authorities (RCAs)

- is an integral part of the overall management system for the road network.

An SMS is the fundamental means of achieving the vision of a greater degree of consistency in how the national road environment appears to road users. In order to ensure that an RCA is continually achieving its vision through the use of its SMS, it is vital that the RCA is able to continually improve and develop their SMS over time.

Continuous improvement is the term used to describe the fact that system improvement takes place in incremental steps. It never stops. However good things may be, they can always be better. Continuous improvement is a relentless effort to improve the SMS, in order to add value to the customer, the road user.
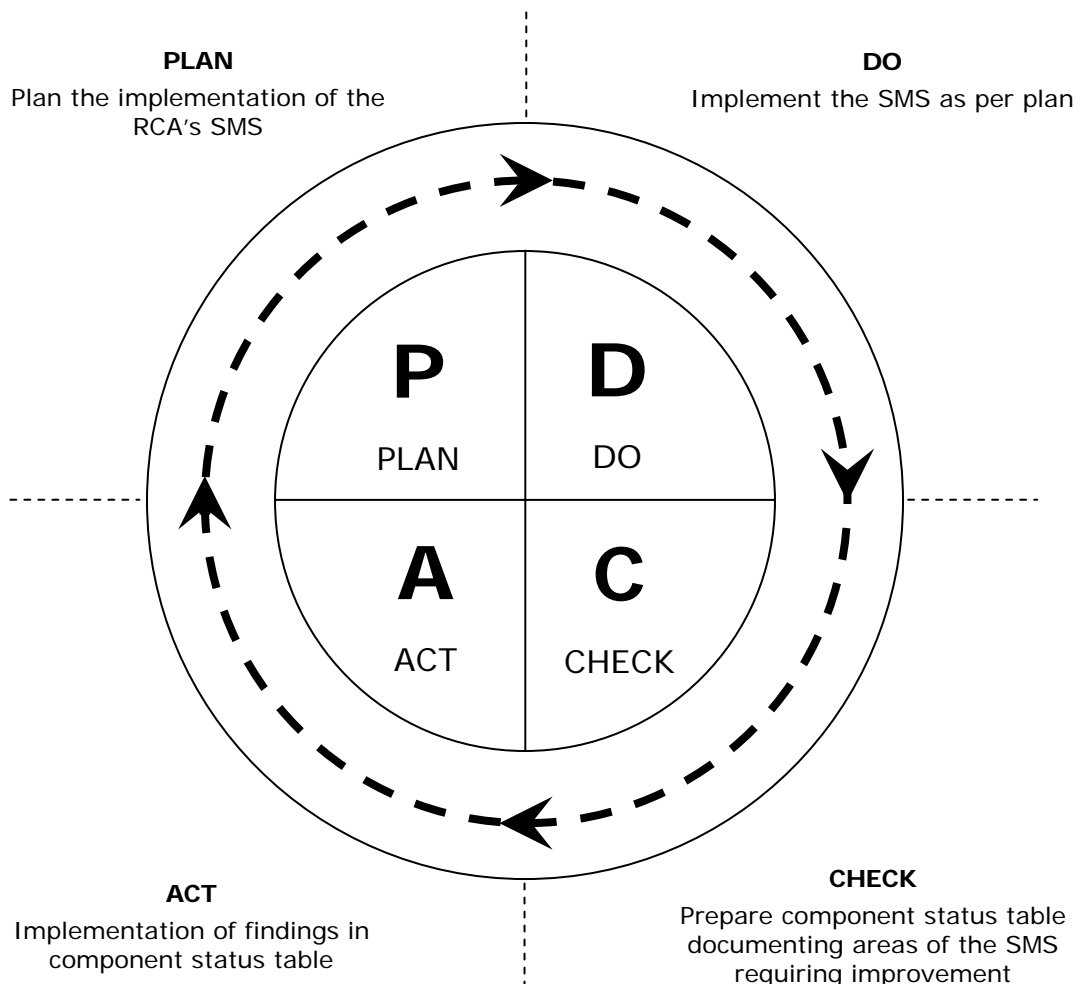
Once the RCA commences implementing their SMS they begin the process of continuous improvement. This workbook contains a set of checklists to assist the RCA during the process of implementation of their SMS. These checklists assist the RCA to ensure that all of the issues identified within their SMS documentation are being implemented appropriately.

It should be noted that due to the diverse nature of each RCA, not all issues and items noted in the workbook will be needed. Some of the critical items, however, will be common to all. Other issues unique to a particular RCA, which are not noted in the workbook, may be included in that RCA's SMS.

I.2   Continuous improvement

Continuous improvement is the term used to describe the fact that system improvement takes place in incremental steps. A key tool used to achieve continuous improvement is the Plan–Do–Check–Act (PDCA) cycle. The PDCA cycle is a checklist of four stages which one must work through to get from one stage of the improvement process to the next. The four stages are:

1   Plan.

2   Do.

3   Check.

4   Act.

PLAN
Plan the implementation of the RCA's SMS

DO
Implement the SMS as per plan

P	D
PLAN	DO
A	C
ACT	CHECK

ACT
Implementation of findings in component status table

CHECK
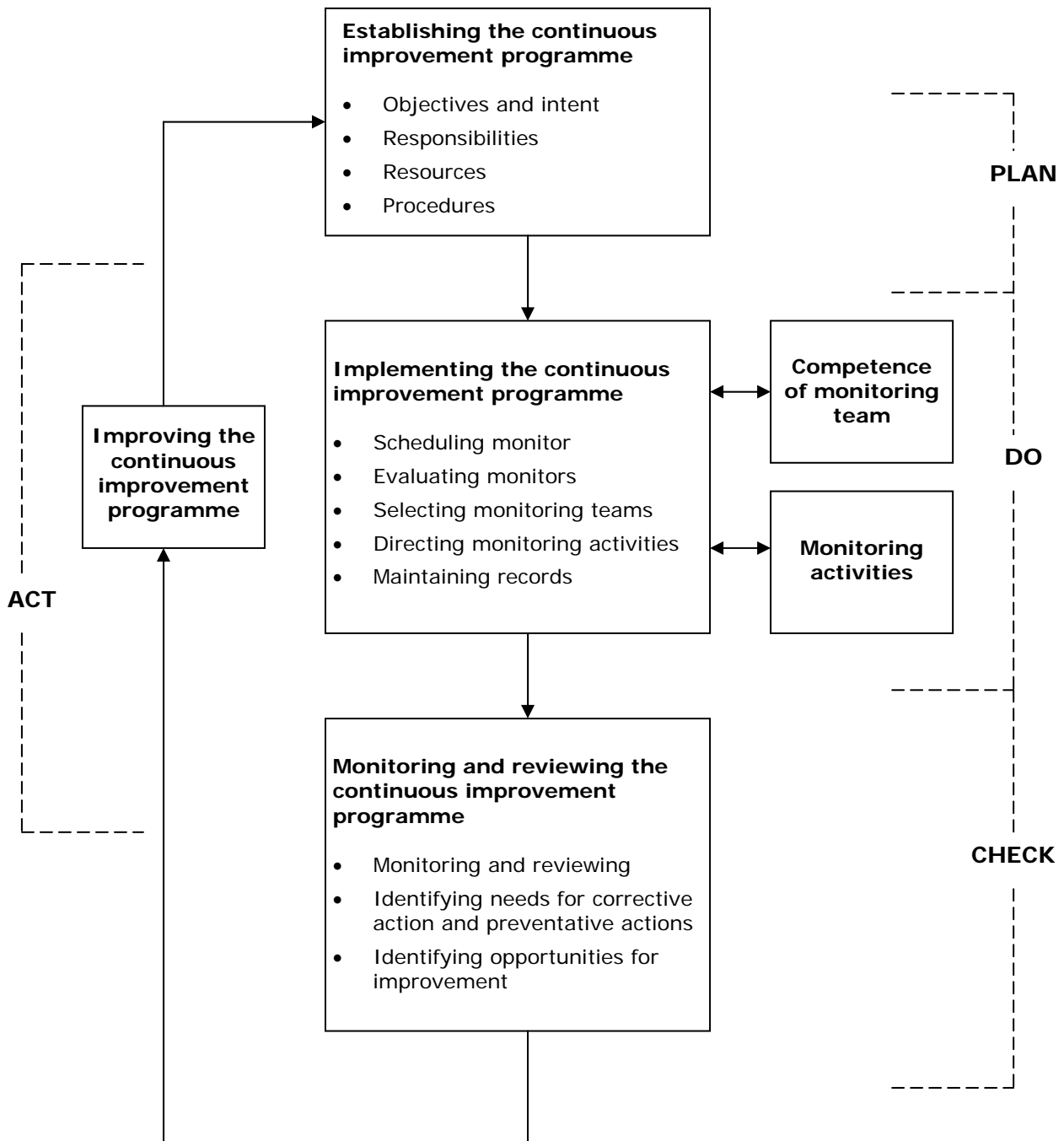Prepare component status table documenting areas of the SMS requiring improvement

The PDCA cycle is at the heart of the continuous improvement programme. It forms the focus of continuous improvement of the RCA's SMS, by ensuring the RCA is always evaluating its SMS with respect to its ability to achieve the required end outcome, meeting its road safety strategy.

I.3   The continuous improvement process

Overview of the process

Continuous improvement is a process that should be planned and managed over a specific timeframe and directed towards a specific purpose.

A continuous improvement programme includes all the planning, organising and conducting of activities in order to determine opportunities for improvement.

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┌────────────────────────────────┐
│ Establishing the continuous    │
│ improvement programme          │
│                                │                              PLAN
│ •   Objectives and intent      │
│ •   Responsibilities           │
│ •   Resources                  │
│ •   Procedures                 │
└────────────────────────────────┘

┌──────────────┐   ┌────────────────────────────────┐   ┌──────────────┐
│ Improving the│   │ Implementing the continuous    │   │ Competence   │
│ continuous   │   │ improvement programme          │◄─►│ of monitoring│
│ improvement  │   │                                │   │ team         │
│ programme    │   │ •   Scheduling monitor         │   └──────────────┘    DO
│              │   │ •   Evaluating monitors        │   ┌──────────────┐
│              │   │ •   Selecting monitoring teams │   │              │
│              │   │ •   Directing monitoring       │◄─►│ Monitoring   │
│              │   │     activities                 │   │ activities   │
│              │   │ •   Maintaining records        │   │              │
└──────────────┘   └────────────────────────────────┘   └──────────────┘

ACT

                   ┌────────────────────────────────┐
                   │ Monitoring and reviewing the   │
                   │ continuous improvement         │
                   │ programme                      │              CHECK
                   │                                │
                   │ •   Monitoring and reviewing   │
                   │ •   Identifying needs for      │
                   │     corrective action and      │
                   │     preventative actions       │
                   │ •   Identifying opportunities  │
                   │     for improvement            │
                   └────────────────────────────────┘
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I.3   The continuous improvement process, continued

The programme

The SMS continuous improvement programme is intended to assist the RCAs with the management of their SMS. This is to ensure the RCA is always striving to achieve its road safety strategy and a vision of a greater degree of consistency in how national road environments appear to road users. The continuous improvement programme comprises three separate stages, conducted over a period of time, as required by the individual RCA, in consultation with Land Transport NZ SMS sponsor. This workbook concentrates on the monitoring aspect of the continuous improvement programme.

Monitoring

The initial stage of the continuous improvement programme is monitoring. The aim of this first stage is to clarify if the RCA is following its obligations, as documented within the RCA's SMS manual, and to determine what improvements are required with the SMS.

Once the RCA's SMS has been endorsed (via the SMS stage 3 documentation review sign-off meeting) it is important to determine if the policies, procedures, systems etc, that the RCA has chosen, are actually being followed and the level to which they are followed. Monitoring seeks to obtain verification through objective evidence, ie the monitoring team will inspect documentation and records held by the RCA to confirm how the RCA implements the SMS.
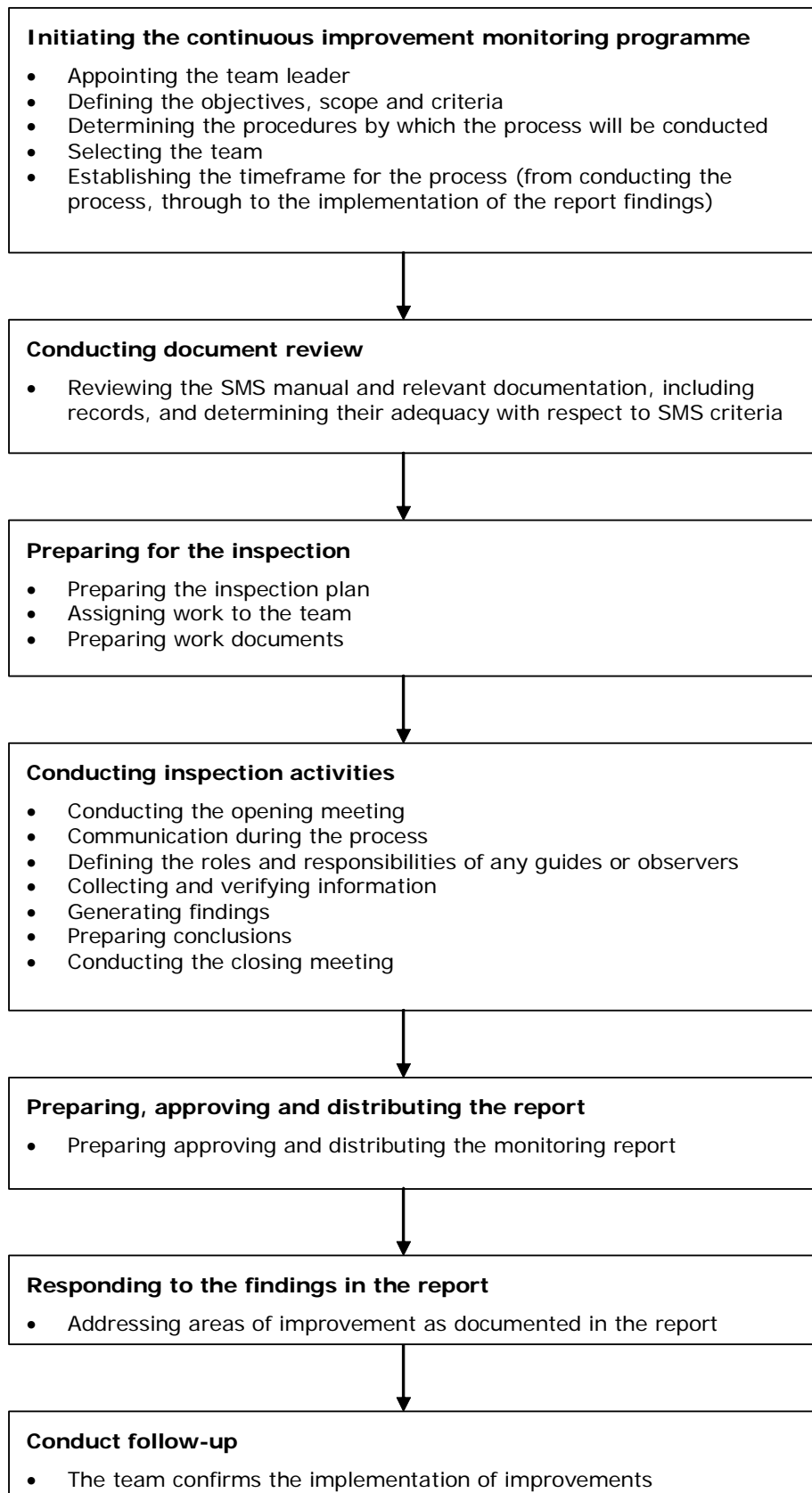
Conducting continuous improvement monitoring

The three different stages of the continuous improvement programme – monitoring, evaluation and SMS review – follow a very similar process, in terms of the manner in which they are conducted and managed. The suggested process is shown on the following page.

Suggested prompt questions are provided on pages 3I-7 to 3I-31. The monitoring team may draw on these to identify how the components included in the SMS are being delivered.

An example component status checkbox for use by the monitoring team is provided on pages 3I-32 to 3I-39. An electronic copy is also proved in part 4–F 1 and 2.

I.3   The continuous improvement process, continued

Initiating the continuous improvement monitoring programme

- Appointing the team leader
- Defining the objectives, scope and criteria
- Determining the procedures by which the process will be conducted
- Selecting the team
- Establishing the timeframe for the process (from conducting the process, through to the implementation of the report findings)

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Conducting document review

- Reviewing the SMS manual and relevant documentation, including records, and determining their adequacy with respect to SMS criteria

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Preparing for the inspection

- Preparing the inspection plan
- Assigning work to the team
- Preparing work documents

↓

Conducting inspection activities

- Conducting the opening meeting
- Communication during the process
- Defining the roles and responsibilities of any guides or observers
- Collecting and verifying information
- Generating findings
- Preparing conclusions
- Conducting the closing meeting

↓

Preparing, approving and distributing the report

- Preparing approving and distributing the monitoring report

↓

Responding to the findings in the report

- Addressing areas of improvement as documented in the report

↓

Conduct follow-up

- The team confirms the implementation of improvements

I.4   Monitoring component checklist: SMS structure

Philosophy

The background philosophy of the SMS should be defined. The SMS can be a high-level document making reference to other documents, a stand-alone document or a combination of both. The intended audience and method of use of the SMS should be defined.

- Where is the RCA's philosophy of the SMS defined?

- Who, in the RCA, uses the SMS document? (Provide examples)

- How do these people use the SMS document? (Provide examples)

- Why (for what reason) do these people use the SMS document? (Provide examples)

- When do these people use the SMS document? (Provide examples)

Linkage to other documents

The SMS will reference and complement other planning and management documents of the RCA. Some documents will be based around the outputs of the SMS, ie the annual plan and asset management plan, others will use the SMS outputs to support regular reviews, ie the district plan. The way the SMS links to other documents should be defined.

- What other RCA (planning and management) documents are referenced within the RCA's SMS documents?

- Why are these RCA (planning and management) documents referenced in the SMS?

- Are RCA (planning and management) documents cross-referenced, ie, are the relevant SMS sections referenced in these (planning and management) documents?

I.5   Monitoring component checklist: road safety strategy

RCAs have many different formats for their road safety strategies (RSSs) and road safety plans (RSPs). The most appropriate format for use in the SMS is to have an RSP that is a prescriptive document detailing specific programmes that can be referred to from the SMS if necessary. The RSS is a less detailed version of the RSP. The RSS is a policy document.

The RSS may or may not be part of the SMS. It could be a separate document that the SMS refers to or it could be a section within the SMS.

The first group of items listed are those that will define the objectives of the strategy.

Vision

The RCA should set a realistic and achievable vision for road safety. For example, it is not realistic to expect no crashes on the roads when many of the crashes cannot be controlled by the RCA.

- How does the RCA define its vision for road safety?
- Who is involved in this process to define the vision for road safety, and why?
- Why does the RCA believe its road safety vision is realistic?
- How does the RCA ensure that its road safety vision is compatible with the national road safety goals?
- How does the RCA plan to update and develop its vision to ensure it remains current?
- How does the RCA ensure that any new developments are included within the SMS and are followed?

Key stakeholders and partners in the community

These are the groups/individuals that will contribute to and benefit from the success of the RSS. The RCA may typically create or join specific community groups to promote road safety. An example is the Road Safety Co-ordination Committee.

- What groups are affected by, or could affect, the RCA's delivery of their SMS?
- How does the RCA consult with these groups, as they develop and maintain their SMS?
- Does the RCA receive any inputs from these groups, and if so, what happens to this input?
- How will the RCA ensure that these groups will be consulted with, as the SMS is developed and improved over time?
- Does the RCA have a system to receive, include, address and respond to, input from these groups?

I.5   Monitoring component checklist: road safety strategy, continued

Problem analysis

The RSS should analyse the level of road safety currently experienced within the area and identify the costs to the local community of road crashes. The analysis should be detailed enough to identify the target safety issues that the RCA considers it could make safety improvements in.

The RCA may also keep a database of crashes reported by the local community to complement the Land Transport NZ crash database. This should not subvert or duplicate the Land Transport NZ database or the scale of the safety problem will be overstated.

- How does the RCA analyse the level of the safety problem within their area?
- Does the RCA compare its analysis with any other RCAs in its peer group, or with Land Transport NZ?
- With respect to the information and data the RCA collects via such analyses:
  - How is it collected?
  - How is it utilised?
  - How is it updated over time to ensure currency?
  - How does the RCA liaise with Land Transport NZ when utilising such information or data?
  - How does the RCA relate this information to show its progress with respect to delivery of its road safety vision?

Key safety issues

Based on the problem analysis, the RSS should identify key safety issues that will influence and improve road safety. These issues should be achievable and realistic and specific to the target areas identified in the problem analysis. Other less well-defined areas such as community involvement should also be included as well as (ideally) education and enforcement issues.

- How does the RCA identify the key safety issues?
- How does the RCA prioritise the key safety issues it has identified?
- How does the RCA develop a response or plan to each of the key safety issues identified during the development and maintenance of the SMS?
- How does the RCA implement the response or plan for each of the key safety issues identified during the development and maintenance of the SMS?
- How does the RCA expect to develop and implement responses to future key safety issues that it might identify?

I.5   Monitoring component checklist: road safety strategy, continued

Scope

It is essential that certain elements are included in the initial SMS. These are the items that the RCA can directly influence. While the community elements are also considered essential, it is acknowledged that they can be more difficult to produce because of the diverse nature of the groups involved. They can be added later if necessary.

How does the RCA address the following elements within its SMS:

- Physical activities on the road reserve.

- Design of improvements.

- Land-use activities including land-use planning.

- Regulatory controls.

- Enforcement.

- Road safety education and publicity.

What other elements or areas has the RCA addressed within its SMS and how has this been achieved?

Community education initiatives

These initiatives will probably involve external organisations and the RCA's involvement with the initiative may be limited. Whether this will be fully included in the RSS or referred to as a separate document will be a matter for each RCA to resolve. Education initiatives should aim to develop a safety culture within the RCA and the wider community at large.

- How does the RCA participate in education initiatives, either on its own or in association with community groups?

- How does the RCA link these education initiatives to its SMS?

- How does the RCA promote a safety culture within its organisation?

- How does the RCA promote a safety culture within its community?

Enforcement initiatives

The RCA should have a good working relationship with all their road safety partners. An important partner is the NZ Police. Sharing knowledge of the safety problems that each is aware of will improve the ability of both organisations to carry out their respective roles in improving road safety. An example is speed management and enforcement.

- How does the RCA exercise its relationship with the Police, to ensure road safety?

- How does the RCA make recommendations on the distribution of Police hours applied to strategic outputs in the National Land Transport Programme (NLTP)?

I.6   Monitoring component checklist: delivery of the strategy

These mechanisms should deliver improved safety with a focus on the key safety issues identified in the strategy above. The order of these items does not indicate their relative importance.

Crash reduction studies

These are formal studies carried out to investigate the cause of groups of crashes at black spots based on the crash analysis system (CAS) and local information (if available). The studies generally produce engineering solutions to identified safety deficiencies at the site. They rely on past safety records to determine the problem.

Some RCAs carry out grey spot studies where a regular analysis of crash data will identify sites that could become black spots. This is a more proactive approach that attempts to prevent sites becoming black spots.

How does the RCA carry out formal crash reduction studies?

With respect to a programme for crash reduction studies:

- How does the RCA identify and address specific safety concerns?

- How does the RCA ensure it has adopted an appropriate approach to address the safety concerns that have been identified?

- How does the RCA ensure that suitable personnel (skills, experience and level of independence) undertake these studies?

- How does the RCA determine which sites are included within a crash reduction study?

- How does the RCA utilise the CAS in its crash reduction studies?

With respect to the actual crash reduction studies:

- How does the RCA determine the goals for the studies?

- How does the RCA measure the expected outcomes of the studies?

- How does the RCA prepare a response to the recommendations of the studies?

With respect to the crash reduction studies and the RCA's relationship with Land Transport NZ:

- How does the RCA liaise with Land Transport NZ throughout the development of the crash reduction studies?

- How does the RCA obtain commentary from Land Transport NZ on the studies and any solutions developed?

Technical auditing

There are a number of different types of audits. These are necessary to ensure that work is appropriately checked and at regular intervals. Some are project audits and some are systems audits. System audits carried out for the SMS are undertaken annually. A proportion of each may be completed in-house, but some must be carried out externally to ensure that in-house work and auditing is of a standard that is equal to the wider industry.

I.6   Monitoring component checklist: delivery of the strategy, continued

Technical auditing, continued	**Project safety audit**

Project safety audit

With respect to the safety auditing for projects – maintenance and/or construction:

- How, and where, does the RCA define its safety auditing policy?

- How does the RCA determine which projects require safety auditing?

- How does the RCA implement its safety auditing policy?

With respect to the performance of the safety audits for projects:

- How does the RCA determine the requirements (eg, skills, experience, training) for the audit personnel?

- How does the RCA determine the scope for the audit?

- How does the RCA conduct the actual safety auditing:

  - what procedures and processes are utilised?

  - what standards or guidelines are referred to – internal and/or external?

  - what relevant documentation, such as audit guides and templates are used?

- How does the RCA manage the audit report process – the development, review of and response to the audit report?

- How does the RCA ensure an efficient and effective remedy is produced in response to issues and concerns noted in the audit report?

Existing road safety audits

How does the RCA ensure safety audits are conducted for existing roads?

How does the RCA programme these safety audits within its forward financial plans?

- *The questions noted under Project safety audit above, may be applied in this section, with a focus on the safety auditing of existing roads, instead of maintenance and construction projects.*

I.6   Monitoring component checklist: delivery of the strategy, continued

Temporary traffic management

Temporary traffic management is becoming increasingly important, as road networks are being developed and maintained with traffic growth requiring greater consideration of the needs of traffic to negotiate the works safely and efficiently. Standards for temporary traffic management have recently changed and the number of different standards consolidated into a single standard. Temporary traffic management schemes should be approved and audited on site to ensure they are safe and comply with standards.

With respect to the RCA's policy for specifying temporary traffic management standards:

- How does the RCA ensure that the policy is current?

- How does the RCA approve schemes prior to their implementation?

- How does the RCA ensure that the standard utilised for temporary traffic management and interpretations is appropriate?

With respect to the auditing of temporary traffic management on the road:

- How does the RCA determine the requirements (eg, skills, experience, training) for the audit personnel?

- How does the RCA determine the scope for the audit?

- How does the RCA conduct the actual safety auditing:

  - what procedures and processes are utilised?

  - what standards or guidelines referred to – internal and/or external?

  - what relevant documentation, such as audit guides and templates are used?

- How does the RCA manage the audit report process – development and review of, and response to the audit report?

- How does the RCA ensure an efficient and effective remedy is produced in response to issues and concerns noted in the audit report?

I.6   Monitoring component checklist: delivery of the strategy, continued

Deficiency analysis and register

The RCA needs to be aware of the specific safety deficiencies within its road network so that improvements can be programmed. Deficiencies can be identified in a number of ways including formal safety inspections. The deficiencies identified should be entered into a database for recording purposes and future ranking. Some of the deficiencies may be used to develop the minor safety programme. Others may need to be programmed for major remedial action or entered onto a maintenance programme.

- How does the RCA conduct routine safety inspections on the roads to identify specific safety deficiencies and at what frequency?

- What other methods does the RCA utilise to identify deficiencies, eg public complaints?

- How does the RCA record the deficiencies identified, to ensure they are utilised for programmes for future upgrading?

- How does the RCA analyse any identified deficiencies, prior to their inclusion in the programme?

- How does the RCA utilise the register in developing the minor safety programme?

- Why does the RCA consider that the method of prioritising the deficiency is appropriate?

Hazard register

The RCA needs to be aware of any recurring intermittent safety issues that may not be able to be remedied permanently such as ice and flooding or growing vegetation that will limit visibility, or vegetation that may fall on the road after strong winds. Other hazards may be identified that are part of a future improvement programme and need to be managed in the interim period. This is not the same as the deficiency register.

- How does the RCA identify and record recurring safety issues, eg a hazard register?

- How does the RCA ensure that contractors are aware of and use the register?

- How does the RCA update the register as new hazards are identified?

- How does the hazard register affect land-use planning?

Road hierarchy

Roading hierarchies can be created for different purposes.

With respect to a roading hierarchy:

- How does the RCA determine its hierarchy for its roading network?

- How does the RCA utilise this hierarchy when:
  - determining funding priorities
  - determining design standards
  - determining maintenance standards.

I.6   Monitoring component checklist: delivery of the strategy, continued

Traffic counting

While not a specific safety issue, it is important for the RCA to understand traffic demands and patterns on its roads.

- How does the RCA utilise its traffic counting programme to provide adequate information of traffic demands on the network?
- How does the RCA use this programme to determine priorities?

RAMM data

An up-to-date inventory system such as road assessment and maintenance management (RAMM) can contribute to road safety. It can tell where sections of the road fail to meet set standards for roads of that type as well as supplying an inventory of road furniture for future maintenance reference. The standards are set to achieve a consistent road environment.

- How does the RAMM gather data to provide information on network (as opposed to structural) deficiencies?
- How does the RCA utilise this information to determine priorities?

Speed management

Speed management should involve both enforcement and engineering to provide a consistent speed environment.

- How does the RCA determine its goals for managing speed?
- How regularly does the RCA review speed limits to ensure appropriateness?
- How does the RCA develop and document actions and strategies to manage speed?
- How does the RCA ensure it has the appropriate outcomes and performance measures to determine success in managing speed?

Maintenance of traffic control devices

Traffic control devices require a regular check to ensure that they have not been vandalised, damaged accidentally or failed due to age. This includes:
- signs
- delineation devices
- road markings
- traffic signals
- any other device the RCA may use.

- How does the RCA ensure there is regular inspection to identify and replace damaged or deficient standards of traffic control devices for each type of device?
- How does the RCA ensure these inspection periods are suitable?
- How does the RCA ensure these replacement or repair response times are adequate?

I.6   Monitoring component checklist: delivery of the strategy, continued

Traffic management facilities

Many local authorities use some form of traffic management devices. These are usually in urban areas and include local area traffic management schemes and urban/rural speed thresholds. The design of these is non-standard and varies among RCAs.

- How does the RCA implement its policies and standards for the use and design of traffic management facilities?

Land-use planning and regulatory controls

Adjacent land-uses can affect road safety if they are not controlled to be sympathetic to the road network. This includes their access points, on-street manoeuvring and parking demand and any associated site specific signage. Advertising signs fall within this category. Excessive amounts of advertising can cause distraction and sign clutter detracting from important regulatory and warning signs. Other signs such as sandwich board signs on the footpath can create a hazard for pedestrians if they are not controlled properly. Typically, these issues are controlled through the district plan and/or bylaws.

- How does the district plan address safety issues when applying for resource consent or subdivision consent?
- How do road safety staff provide input into the resource consent process?
- How do road safety staff provide input into the district plan and bylaw review process?
- How does the RCA conduct safety audits on proposed and new subdivisions?
- How does the RCA conduct safety audits as part of the resource consent process and after approval?
- How does the RCA control and approve advertising signage?

Street lighting

Street lighting has many purposes including road safety. In urban areas, it can improve drivers' vision of pedestrians, cycles and stationary vehicles. It also illuminates properties and can improve security. It can also cause a nuisance to some residents by shining into their rooms and preventing sleep so some balance must be provided between conflicting demands.

In rural areas, street lighting can identify intersections of some importance for approaching drivers and can identify changes in road environment such as at passing lane diverges and merges.

- How does the RCA ensure the AS/NZ Standard is used for road lighting in contracts and maintenance?
- How does the RCA specify the acceptable level of lighting for each road type and/or road?
- How does the RCA address flag-lighting at rural intersections?

I.6 Monitoring component checklist: delivery of the strategy, continued

Landscaping and vegetation control

Experience has shown that many RCAs have difficulty managing design, installation and maintenance of landscaping in the road reserve.

- How does the RCA determine the requirements for landscaping and vegetation control within the road reserve?
- Where does the responsibility for the landscaping lie within the RCA?
- If the responsibilities do not lie within the RCA's department, how does the RCA ensure it has effective control over its activities?

Overdimension and overweight routes

There are safety issues when trucks carrying overdimension or overweight loads use inappropriate roads damaging the road structure and/or street furniture, or may not be able to negotiate intersections such as roundabouts.

- How does the RCA address issues of overdimension and overweight routes for its network?
- How does the RCA enforce the use of these routes?

Vulnerable road users

Vulnerable road users include those with special needs that may not need to be catered for in all projects but their potential presence should be considered and evaluated in any project. These can include children, elderly, tourists, people with intellectual handicaps, sight impaired and specific facilities such as hospitals and schools where these people may congregate.

- How does the RCA ensure they are made aware of the specific needs of vulnerable road users and the facilities and routes they most commonly use?
- How does the RCA address the specific needs for each type of vulnerable road user?
- How does the RCA measure performance for each type of vulnerable road user?

Cycle facilities

Most regional transport strategies have a policy of encouraging modal switch from private passenger vehicles to public transport and cycles.

- How does the RCA encourage modal switch to cycling?
- How does the RCA provide alternative networks for cyclists in its system?
- How does the RCA consider cyclists at all stages of the road planning process?

I.6   Monitoring component checklist: delivery of the strategy, continued

Pedestrian facilities

Pedestrian facilities need to be well designed and used to ensure adequate safety for all road users. The location of the crossing is also important in that it must allow sufficient visibility for the driver to be aware of the facility's existence and intervisibility between the driver and the pedestrian. Where the facility is used at night, adequate lighting should be provided.

Where pedestrians are encouraged to cross the road, a different material from the footpath should be used so that pedestrians recognise that they are no longer on a protected footpath.

- How does the RCA use the appropriate guidelines and warrants for establishing and maintaining the pedestrian facility?
- How does the RCA monitor use of pedestrian facilities to ensure they continue to meet their warrant requirements?
- How does the RCA ensure pedestrian facilities are illuminated when they have significant night-time usage?

Footpaths

Footpaths provide separation between traffic and vulnerable road users such as pedestrians and disabled people. The standard of maintenance of footpaths is critical as they are used by people who may not be able to clear shallow obstructions and may drive mobility scooters. Mobility scooters are often unable to climb steep inclines from the footpath to the carriageway when crossing roads. Footpaths need to be kept clear of vegetation that could obstruct or injure pedestrians.

- How frequently does the RCA inspect footpaths for defects such as tree root damage?
- How does the RCA ensure that footpaths remain clear of vegetation?
- How does the RCA consider mobility scooters when providing footpath access to road crossings?

I.6   Monitoring component checklist: delivery of the strategy, continued

Drainage systems

There are a number of individual parts to any drainage system and each of these should be considered. Rural and urban drainage systems are typically quite different.

Bridges/culverts

Bridges and culverts require regular inspection to ensure that their structural integrity is intact. They also require regular maintenance to ensure that their waterways and headwalls are clear and that steel surfaces are regularly painted. The end treatments are also important to ensure that if a vehicle strays from the carriageway, it does not strike a non-frangible object such as a concrete headwall.

- How does the RCA manage its inventory of all its bridges and culverts?

- How does the RCA ensure it investigates, in a timely fashion, the structural integrity of the bridges and culverts including headwall protection using appropriately qualified personnel?

- How does the RCA ensure it inspects and clears, in a timely fashion, the vegetation in the waterways that would impede flow in the channel?

- How does the RCA ensure it inspects and repairs, in a timely fashion, steel members on bridges?

- How does the RCA protect bridges with safety barriers?

- How does the RCA address the replacement or widening underwidth bridges and culverts?

Catchpits/sumps

These range from soakholes in free draining soils to structural sumps in the carriageway. All are essential and must be maintained appropriately. If not, localised flooding can result causing damage to the roads and adjacent properties, and vehicles may lose control in flood waters. Sump gratings can cause problems for users such as cyclists whose wheels may get caught in the gratings.

- How does the RCA ensure it inspects, in a timely fashion, drainage structures to ensure they are not blocked or damaged?

- How does the RCA specify sump gratings that are perpendicular to and level with the travel path of cyclists?

I.6   Monitoring component checklist: delivery of the strategy, continued

Drainage systems, continued

Kerbs and channels

Kerbs and channels control the flow of water and protect the edge of the road from damage. They also define the trafficable portion of the carriageway and are often used in rural areas around intersections to control the path of traffic around the intersection. Over time, kerbs and channels can become rough and damaged and hold water in puddles or allow it to infiltrate under the road.

- How does the RCA ensure it inspects and replaces, in a timely fashion, kerbs and channels as they are damaged?
- How does the RCA use kerbs and channels in rural areas to define vehicle paths and protect road edges and embankments?

Deep drains and irrigation channels

Deep drains can be a hazard for pedestrians (particularly children) who may fall into them while they are in flood. They may also be close to the carriageway and often have vertical sides that will not allow a vehicle to recover if it is out of control. This is related to clear zone policy.

- How does the RCA address the issue of piping urban drains to prevent access by pedestrians?
- How does the RCA protect traffic from deep drains and irrigation channels adjacent to the carriageway?

Swale drains

These are shallow drains in rural areas that allow overland flow of water from the carriageway to drainage structures. They are usually used in flat terrain. Because of this, maintenance is important to prevent vegetation from slowing the flow of water and creating ponding.

- How does the RCA address the design of swale drains?
- How does the RCA address the maintenance of the vegetation within the swale drains?

I.6   Monitoring component checklist: delivery of the strategy, continued

Vehicle crossings and accessways

All properties are required to have frontage to a road whether or not they use it for vehicle access. Informal vehicle crossings cause damage to footpaths and berms. The structure of footpaths is not usually strong enough to accept vehicles, and damage to footpaths may impact on utilities underneath. Informal vehicle crossings may not be located in the safest location with the best visibility.

- How does the RCA ensure all property owners apply for formal vehicle access?

- How does the RCA ensure the relevant standards are utilised as part of the application process?

- How does the RCA take action against those that do not have an approved vehicle crossing?

- How does the RCA specify visibility requirements for vehicle crossings?

Stock control, crossings and underpasses

Many RCAs have areas where stock may have access to roads. This can be either for droving along the road or crossing the road to access land on the other side of the road. The occurrence of stock crossing has increased recently with the conversion to dairy farms. Control of stock movements is important to prevent uncontrolled interaction between the stock and other road users. Some RCAs subsidised stock underpasses where the movement of stock is frequent.

- How does the RCA implement its policies and bylaws to control stock access to, and movement along the road?

- How does the RCA ensure farmers comply with temporary traffic management practices while their stock are on the road?

I.6   Monitoring component checklist: delivery of the strategy, continued

Effluent disposal facilities

Effluent disposal facilities have become important since new regulations requiring stock trucks to have effluent holding tanks on their trucks have come into force. These rules were promulgated to prevent uncontrolled stock effluent being concentrated on the carriageway and splashed onto vehicles and windscreens. Stock effluent can also degrade the road surface. The effluent disposal sites are generally on high-volume, high-speed rural roads and may be near places where stock are held such as saleyards and freezing works.

- How does the RCA control stock effluent on the roads?
- How does the RCA address the need for effluent disposal sites within their area?

Weighbridges

Weighbridges are provided on the road reserve for the use of the Police. The RCA has a role in approving and usually siting the weighbridge in consultation with the Police. Demand for the weighbridges tends to be on higher-volume, high-speed rural roads and their design is critical to ensure that they are safe.

- How does the RCA address the siting and construction of weighbridges?

Rest areas

Rest areas are provided to allow drivers to stop and rest safely when fatigued. They are also located in places where there is a high natural value and drivers may want to stop to view the scenery or some other attraction without becoming a traffic hazard. Often, they are intended to cater for tourists and their design needs to allow for this.

- How does the RCA address the provision of rest areas within its area?

Safety barriers

Safety barriers have many new forms and can be applied in many situations that were previously uneconomic. However, some uses of safety barriers can create a greater hazard than the hazard they are trying to protect. Examples are when a safety barrier is short or terminates on curves without adequate flaring.

- How does the RCA manage the use of safety barriers?
- How does the RCA ensure the appropriate standards are applied to the design of safety barriers?
- How frequently does the RCA inspect safety barriers to ensure they retain their integrity?

Retaining structures

Retaining structures are generally constructed around structures such as bridges, or to prevent steep, unstable slopes from collapsing onto the carriageway. Particular maintenance requirements include draining the structure adequately to prevent pore pressure building up behind the structure and preventing scour and the loss of material from behind the structure.

- How frequently does the RCA inspect retaining structures to ensure their integrity?

I.6   Monitoring component checklist: delivery of the strategy, continued

Parking

Parking on the street can cause safety problems, particularly on arterial and other major roads. Cyclists can be endangered by parked vehicles, both angle parked and parallel parked. If insufficient width is provided for cyclists adjacent to parallel parked vehicles, drivers may open car doors in front of the cyclist. Angle parking reduces the driver's view of the approaching cyclist. This can be controlled to some extent through appropriate land-use planning and application of bylaws.

- How does the RCA control the amount of on street parking demand by requiring developments to accommodate their parking demand on site?
- How does the RCA address angle parking on streets on main roads?

Emergency response

By their nature, emergencies are unforeseen events. These can vary from vehicle crashes to land slides and water pipe explosions. The RCA must have a flexible plan that allows for an appropriate response to any problem.

- How flexible is the RCA's emergency response plan?

Road closures

Road closures must be approved and advertised prior to the closure. Closures are required for road works or events such as parades.

- How does the RCA manage road closures?
- How does the RCA ensure that its process for managing road closures complies with the legislative requirements?

Pavement maintenance

Scrim analysis

This is a system of testing the skid resistance of the pavement surface.

- How frequently does the RCA conduct testing of its sealed roads for skid resistance?
- How does the RCA specify minimum standards of skid resistance for the sealed roads under its control?
- How does the RCA address the treatment of sections of roads that have deficient skid resistance?

Potholes

While potholes may have been shown to be no more than a minor contributor to crashes, they can cause problems of widespread structural failure due to water ingress if not treated properly. They can also cause serious safety problems to cyclists and pedestrians.

- How frequently does the RCA conduct inspections of the surface for potholes?
- How frequently does the RCA repair potholes?
- How does the RCA determine which standards are to be utilised for the repair of potholes?

I.6   Monitoring component checklist: delivery of the strategy, continued

Pavement maintenance, continued

Physical defects

Long-term deterioration will be picked up by regular RAMM rating surveys. Items such as road roughness will be identified during these surveys. Systematic inspections to identify the maintenance issues should be carried out between surveys to identify visual failures such as rutting and loose material on the carriageway.

In between surveys, there may be sudden failure of the road due to unforeseen circumstances.

- How frequently does the RCA conduct RAMM rating surveys?
- How does the RCA specify systematic visual inspections of the road to identify structural road failures or distress?

Grading unsealed roads

The regular grading of unsealed roads is important to prevent minor problems escalating into larger problems that require reconstruction work.

- How actively does the RCA monitor the condition of unsealed roads prior to grading?

Clear zones

Clear zones attempt to keep the road shoulders clear of obstructions so that an out of control vehicle has some chance of recovery or stopping without striking a solid obstruction. This includes the gradient of shoulders. Only frangible objects should be placed in the clear zone and even then with caution. Where sufficiently clear zones cannot be provided, protection of the hazard may be the alternative.

- How does the RCA address the provision of clear zones?

Railway crossings

Railway crossings have been the site of many serious crashes over the years. Although the crossings are under the jurisdiction of the rail operator, the RCA has an important advocacy role to ensure that the rail operator maintains and upgrades rail crossings to an acceptable standard for road users. The RCA also provides the advanced signage.

- How does the RCA address railway crossings?
- How frequently does the RCA make contact with the rail operator to discuss concerns about rail crossings?

I.6 Monitoring component checklist: delivery of the strategy, continued

Road openings by utility and other external service authorities

The RCA is responsible for the road network and must exhibit some control over those who work on it. They can only do this effectively when they know who is working on the road and where and when they are working on the road.

- How does the RCA maintain a street openings register to be aware of where and when contractors will be working on the road so they and their work can be inspected/audited?

- How does the RCA specify the temporary traffic management requirements for external service authorities and their contractors to work on the road?

- How does the RCA ensure that these requirements are similar to those that the RCA imposes on its own internal contractors?

Road openings by other departments within the RCA's organisation

Experience has shown that the department nominated as being the RCA often has difficulty in getting the co-operation of other departments within the organisation to comply with the traffic management requirements of road openings. These include departments with assets under the road such as sewer and water pipes and those that maintain landscaping on the road reserve.

- How does the RCA manage its service agreements with other internal departments that control their and their contractors' activities in the road reserve?

Roads under the control of other RCAs

A number of other authorities can have public roads within the RCA area but not under the control of the RCA. These include:
- wharves
- airports
- railways
- Department of Conservation.

It is important that the RCA has a good working relationship with any organisation that has control of roads that will eventually affect the RCA.

Other RCAs have common boundaries. It is important that all of the RCAs regularly discuss and agree on issues that affect them, particularly at the boundaries.

- How does the RCA work with each RCA within its boundaries?

- How does the RCA manage its relationship with other RCAs that have common boundaries with it?

I.7   Standards, guidelines and policies

This section in particular, will need to be updated regularly as the RCA changes or introduces new policies, as new standards are adopted and promulgated by the Standards and Guidelines Steering Group, and others are superseded.

The standards, guidelines and policies used should include all known aspects of:

- design

- construction

- maintenance of all roading assets and road reserves.

Some important elements that should be specified are the road design elements including:

- horizontal alignment

- vertical alignment

- carriageway width

- intersection layout

- solid and flush medians.

It is essential that these are communicated easily and accurately to ensure consistency in the road network of the RCA.

Any deliberate departures from the standards, guidelines and policies should be acknowledged on each occasion and recorded for auditing purposes.

Standards

These are the national (Land Transport NZ requirements) and legal standards (government rules and regulations) that must be complied with. They cannot be modified by local decisions unless prior approval is given.

- How does the RCA ensure it is utilising the relevant standards in relation to its SMS?

- How and where has the RCA documented the appropriate standard for each asset and/or activity?

- How do users of the SMS determine which standards should be applied to each asset and/or activity?

- How does the RCA ensure that the list is updated regularly?

- How does the RCA address interpretations of the standards that may vary from the accepted norm?

I.7   Standards, guidelines and policies, continued

Guidelines

These are the national guidelines that may be complied with. There is no legal requirement to work to these guidelines but they are considered to provide appropriate solutions to some safety problems. The RCA may vary the guidelines to suit local conditions but any local variations or interpretations should be documented to ensure that they are communicated clearly to anyone working on the road network.

- How does the RCA document the guidelines to be used?
- How does the RCA formally adopt the guidelines?
- How does the RCA ensure the appropriate guidelines are listed for each asset and/or activity?
- How do users of the SMS determine which guidelines should be applied to each asset and/or activity?
- How does the RCA ensure that the list is updated regularly?
- How does the RCA address the issue of local variations and interpretations of the guidelines?
- How are these local variations and interpretations recorded and communicated properly to those who work on the roads?

Policies

These are the policies adopted by the RCA to address their specific issues that may not fall within a national standard or guideline.

- How does the RCA document the policies to be used or included in the strategy?
- How does the RCA formally adopt the policies?
- How does the RCA ensure the appropriate policies are listed for each asset and/or activity?
- How does the RCA ensure that the list is updated regularly?

Compliance with standards, guidelines and policies

It is acknowledged that there will be occasions when standards, guidelines and policies for general use cannot be applied. On these occasions, the departure from recognised standards should be documented with the reasons why they were not applied.

- How does the RCA record departures from recognised standards, guidelines and policies?
- How does the RCA check within each project (apart from the safety audits) to ensure that the appropriate standards, guidelines and policies have been complied with?

I.8   Expertise, qualifications and roles

Staff training and competence

The RCA is responsible for ensuring that staff responsible for road safety activities are competent for the task. They must be provided with sufficient resources and authority to complete the tasks successfully.

- How does the RCA ensure that the SMS manager has clearly communicated the level of delegation, with respect to the delivery of the SMS?

- How does the RCA ensure its staff comply with the SMS?

- How does the RCA ensure its external consultants and contractors comply with the SMS?

- How does the RCA ensure its staff attend seminars and training sessions to ensure that they are appropriately trained and with sufficient knowledge of state-of-the-art techniques?

- How does the RCA ensure staff development?

- How does the RCA ensure its staff meet the minimum requirements for fulfilling the position as described in the job description?

- Where no RCA staff are sufficiently skilled to meet the requirements for an aspect of the SMS, how does the RCA ensure it employs a consultant/contractor with an appropriate level of skills?

- How does the RCA ensure that the skill levels required are appropriately described and specified in the SMS?

External service authorities and other commercial road occupiers

It is important that external authorities are required to buy into and accept the requirements of the SMS as part of their authority to occupy and/or work on the road. This is an area where the RCA will need to delegate some responsibility to the external authority but must still ensure compliance with the SMS. Standards must be imposed to prevent the recent examples of a rotten wooden power pole falling on a vehicle, catastrophic blowouts of gas and water mains and other problems such as leaking pipes beneath the road causing road structural failure. Standards of maintenance and acceptable risk need to be defined as well as levels of traffic control while working on the road.

Another significant group is farmers who may use roads for crossing or driving stock, installing irrigation pipes under the roads from time to time without being aware of requirements, shelter belt trimming and tree felling.

- How does the RCA work with external service authorities regarding construction and maintenance standards of its assets that are allowed to occupy the road reserve?

- How does the RCA control irregular and informal occupiers of the road by others?

- How does the RCA specify its requirements for scheduled event management?

I.8   Expertise, qualifications and roles, continued

Appointment of consultants and contractors

Appointing consultants and contractors requires a standardised set of procedures. These procedures must comply with legislation and be transparent to avoid any question of inappropriate behaviour in appointments. Not all contracts will require an open tender process but all must have some form of evaluation and paper trail to ensure that the appointee has the credentials and ability to perform to the standard specified by the SMS.

- How does the RCA appoint consultants and contractors?

I.9   Management of the SMS

Management/o wnership of road safety

The organisation must specify who is accountable for the safety of work and ensure that the SMS is complied with. The person who is accountable for the SMS will continue to be accountable even if they have passed on responsibility for managing and operating the system to others. While it may be possible for a person outside the RCA to perform the duties, it is essential that ownership of the SMS resides within the RCA. Smaller RCAs will need to pay particular attention to areas where their duties might overlap with the management and service delivery functions.

- How does the RCA select a staff member who is responsible for championing the SMS?
- How does the RCA's champion ensure compliance with the SMS over time?
- How clearly has the RCA documented the separation of responsibilities between management of the SMS and service delivery?

Monitoring of staff compliance with the SMS

The RCA will need to ensure that staff are complying with the requirements of the SMS. This can only be done with an adequate paper trail to show how the staff have complied. Staff must be able to demonstrate that in carrying out their duties, they have complied with the SMS requirements for that specific duty.

- How does the RCA review projects and staff performance in-house to ensure compliance with the SMS has been achieved?

Ongoing system development

As this is a living document, it is important to identify and rectify deficiencies in the system as soon as practical. All staff should be encouraged to participate in the ongoing development of the system. This is important to encourage ownership of the system among lower level staff.

- How are staff and external agencies provided the opportunity and encouraged to identify improvements to the SMS?

Operational/ management structure

It is important that the roles of all those involved with implementing and maintaining the SMS should be aware of the operational and management structure within the RCA. This can be most effectively communicated by using of a flow chart to show responsibilities in each area.

- How does the RCA document its organisational structure?

I.10   Monitoring and audit

The system must be regularly monitored and audited to ensure that it is appropriate, meets the needs of the RCA, complies with national standards and is successful. The system must be monitored internally for success, audited externally and perhaps internally to ensure that it meets national standards.

Monitoring and review of RSP, RSS and SMS

The RSP and RSS should be reviewed regularly to assess progress towards the goals. A minor review could be held annually with a major review periodically (perhaps every three to five years) to redefine the vision and goals. As well as these formal reviews, the RSS should be updated as new information becomes available that may affect it.

The SMS should be updated on an as-needs basis when new standards, policies, procedures etc become available.

- How does the RCA ensure it is able to maintain and develop its RSS and document these developments?

- How does the RCA record and report its progress towards achieving the vision and goals?

- How does the RCA monitor its staff's progress towards upgrading their knowledge and qualifications?

- How does the RCA control the number of copies of the SMS to ensure that all copies are current with all amendments included?

SMS audit

This is a system audit to ensure compliance with the processes of the SMS. The assumption is made that by carrying out work in accordance with the SMS, safety will be improved. If safety is not improved but the processes are being followed, it will be necessary to revise the SMS to identify specific failings. This is a circular process with the recommendations of previous audits being included to improve the SMS.

- How does the RCA manage the auditing of the SMS?

- How does the RCA identify the requirements for specified external and internal audits?

- How does the RCA monitor performance in achieving the vision and goals of the RSS?

- How frequently are internal and external audits conducted?

- How does the RCA ensure that the auditors have suitable expertise and experience?

- How does the audit determine if goals are being met and systems complied with?

- How does the RCA use the report from previous audits to make improvements to the SMS?

- How does the RCA address issues and non-compliance with the SMS?

- How wide is the scope for the RCA's audit programme (includes review of the policies, procedures, standards and guidelines for consistency, currency and relevance)?

I.11   Checkbox

This checkbox is designed to be completed by the continuous improvement monitoring team to ensure that they have considered the issues and items included in the SMS. This checklist can also be used to identify gaps in RCA's current practices that could be filled during the process of monitoring the implementation of the SMS.

This checklist includes the following:

- Land Transport NZ ranking. Land Transport NZ has identified items to be included in a SMS for it to address a normally expected level of risk. The ranking is as follows:

    ** item normally expected to be included in the SMS

    * item could be included if it has a safety risk greater than medium.

- The continuous improvement monitoring team is encouraged to evaluate each item and issue listed. They can be identified as:

    − item is included in the SMS:

    1   Relevant documents and records: information related to the item such as linkages.

    2   Innovation noted: information on variations from national standards and guidelines.

    3   Improvement noted: information related to the item that needs further monitoring.

    4   Recommendations made: improvement actions related to the item that the monitoring team identifies for programming for improvement.

    − item has not been included in the SMS but should/may be

    − item has not been included in the SMS but further consideration should be given to including it

    − item does not apply to this RCA or is considered a minor or insignificant safety issue.

Additional items not in the list should be included by the RCA if they consider them to be a medium or greater safety issue.

Land Transport NZ ranking	Item	Included in SMS	Not included in SMS but should/ may be	Not applicable in this SMS	Relevant documents and records	Innovation noted	Improvement noted	Recommend - actions made
Endorsement of the SMS								
**	RCA							
**	Land Transport NZ							
Introduction/executive summary/philosophy								
	Introduction/glossary of terms and abbreviations							
	Cover and document structure							
	Philosophy							
	Linkage to other documents							
	Memorandum of Understanding							
Road safety strategy (RSS)								
**	Vision							
*	Key stakeholders and partners in the community and linkages							
**	Identify problems/issues for the road safety strategy to address							
**	Goals							
**	Targets							

Land Transport NZ ranking	Item	Included in SMS	Not included in SMS but should/ may be	Not applicable in this SMS	Relevant documents and records	Innovation noted	Improvement noted	Recommend - actions made
Road safety strategy (RSS), continued								
**	Interventions • engineering initiatives • community education initiatives • enforcement initiatives							
**	Monitoring and measuring of performance							
**	Review date							
Expertise, qualifications and roles								
*	Staff training and competence							
**	External service authorities and other commercial road occupiers							
**	Appointment of consultants and contractors							
Management of Safety Management Systems								
**	Management/ownership of road safety							
**	Monitoring of staff compliance with SMS							
**	Ongoing system development							
	Operational management structure							

Land Transport NZ ranking	Item	Included in SMS	Not included in SMS but should/ may be	Not applicable in this SMS	Relevant documents and records	Innovation noted	Improvement noted	Recommend - actions made
Audit								
**	SMS internal audit							
**	SMS external audit							
	RSS review and monitoring (see road safety strategy on previous page)							
Delivery of the strategy								
**	Crash reduction studies							
**	Deficiency analysis and database							
**	Road safety hazard register of environmental items							
**	Road hierarchy							
**	Traffic counting							
**	Speed management							
*	Street lighting							
**	Landscaping and vegetation control							
*	Clear and safety zones							
- Technical auditing including								
**	Project safety audit							
**	Existing road safety audit							

Guidelines for developing and implementing a safety management system for road controlling authorities

Land Transport NZ ranking	Item	Included in SMS	Not included in SMS but should/ may be	Not applicable in this SMS	Relevant documents and records	Innovation noted	Improvement noted	Recommend - actions made
	- Maintenance of traffic control devices including							
**	Signs							
**	Delineation, (ie, EMP, RRPM. Bridge end markers, hazard markers)							
**	Road marking							
	Traffic signals							
	Any other devices							
	- Traffic management							
	LATM							
	Land use planning controls including: • District plan • By-laws							
	Over dimension and overweight routes							
	Emergency response							
	Road closures							
**	Temporary traffic management including approval and auditing							

Land Transport NZ ranking	Item	Included in SMS	Not included in SMS but should/ may be	Not applicable in this SMS	Relevant documents and records	Innovation noted	Improvement noted	Recommend - actions made
	- Vulnerable road users							
*	Cycle facilities							
*	Pedestrian facilities							
*	Footpaths							
	- Drainage systems							
*	Bridges and culverts							
*	Catch pits and sumps							
*	Kerb and channel							
*	Deep drains and irrigation channels							
*	Swale drains							
	- Crossings							
*	Vehicle crossings and accessways							
	Stock control, crossings and underpasses							
	Rail crossings							
	- Structures and facilities							
	Effluent disposal facilities							
	Weighbridges, stations and pits							
	Rest areas							
	Retaining structures							

Land Transport NZ ranking	Item	Included in SMS	Not included in SMS but should/ may be	Not applicable in this SMS	Relevant documents and records	Innovation noted	Improvement noted	Recommend - actions made
	- Structures and facilities, continued							
	Safety barrier							
	Parking							
	- Pavement maintenance							
*	Scrim analysis							
	Potholes							
*	Physical defects							
	RAMM data and analysis							
*	Grading unsealed roads							
	- Road openings							
	Under control of RCA's roading dept							
	Under control of other departments							
	By utility and external service authorities							
	- Roads under the control of other RCA's including							
	Boundary issues with neighbouring RCA/s							
	Ports							
	Airports							
	Department of Conservation							

Land Transport NZ ranking	Item	Included in SMS	Not included in SMS but should/ may be	Not applicable in this SMS	Relevant documents and records	Innovation noted	Improvement noted	Recommend - actions made
- Roads under the control of other RCA's including								
	Power/hydro authorities							
Standards and Guidelines								
**	Standards							
**	Guidelines							
**	Policies - national							
**	Policies - local							
**	Compliance with standards, guidelines and policies							
General notes								