

# **Application of Strategic Environmental Assessment to Regional Land Transport Strategies**

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## Glossary

AEE	Assessment of environmental effects
Alternatives	Alternatives are different ways of achieving objectives. They are also referred to as options.
BPEO	Best practicable environmental option
CBA	Cost benefit analysis
CO	Carbon monoxide
CO <sub>2</sub>	Carbon dioxide
EIA	Environmental impact assessment
GAM	Goals-achievement matrix
Indicator	A means by which change in a system or an objective can be measured.
LTA	Land Transport Act 1998
LTMA	Land Transport Management Act 2003
LTNZ	Land Transport New Zealand
LTSA	Land Transport Safety Authority
MCA	Multi-criteria analysis
Measure	An individual action to deliver the objectives of a strategy or plan.
Mitigation	Used in this report to refer to measures to avoid, reduce or offset significant adverse effects on the environment.
Monitoring	Activities undertaken after a decision is made to adopt a strategy, plan or programme to examine its implementation.
MoT	Ministry of Transport
NEECS	National Energy Efficiency and Conservation Strategy
NIWA	National Institute for Water and Atmospheric Research
NLTP	National Land Transport Programme

NO <sub>x</sub>	Nitrogen oxides
NZTS	New Zealand Transport Strategy
OECD	Organisation for Economic Cooperation and Development
Objective	A statement of what is intended, specifying the desired direction of change.
PM	Particulate matter
Project	A measure involving development such as new infrastructure.
PT	Public transport
RLTC	Regional Land Transport Committee
RLTS	Regional Land Transport Strategy
RMA	Resource Management Act 1991
RPS	Regional policy statement
Scoping	The process of deciding the scope and level of detail of the SEA. This includes defining the environmental effects and alternatives that need to be considered and the assessment methods to be used.
SEA	Strategic environmental assessment
Target	A specified desired end, stated usually within a specified time-scale.
TPM	Transport Policy Model
Transfund	Transfund New Zealand
Transit	Transit New Zealand
VOC	Vehicle operating costs



## Executive summary

This report has been prepared to identify opportunities for the use of strategic environmental assessment (SEA) in the preparation of regional land transport strategies (RLTSs). The research undertaken for the report was carried out between July 2004 and April 2005, as part of Land Transport New Zealand's 2004/2005 Research Programme.

Over the last decade, SEA has gained increasing international recognition as a means of ensuring that environmental impacts are considered in transport policy and plan making. To date, experience of SEA in New Zealand has been limited. However, recent policy and legislative changes highlight the need to develop a more systematic approach to environmental assessment in transport planning.

With the introduction of the New Zealand Transport Strategy (NZTS) and the Land Transport Management Act 2003 (LTMA), the obligations on local government to address the environmental impacts associated with transport have been strengthened. Regional councils are now required to prepare strategies that take into account environmental sustainability and contribute to a sustainable land transport system. By providing a stronger framework for environmental assessment, SEA can assist councils in meeting these obligations.

Using the Canterbury, Waikato and Wellington regions as case studies, this report examines the RLTS preparation process and identifies opportunities for incorporating SEA into future strategy development. Analysis of RLTS preparation in the three regions shows some similarities between the steps in strategy development and steps in a typical SEA. Common elements that can be identified include the development of environment objectives, the use of a process to consider alternatives and the opportunities provided for public participation.

The analysis also highlights key areas where environmental assessment can be improved. In general, the approach to assessment in the case study regions was found to be limited. Evaluation of RLTS development against an SEA checklist shows:

- Environmental objectives tended to be of a general nature, lacking sufficient definition to guide strategy development.
- Scoping of environmental issues and collection of baseline data was limited and focused on a narrow range of considerations.
- Processes to identify and evaluate alternative courses of action were not supported by comprehensive environmental analysis. Alternatives were developed primarily in response to existing problems rather than as a way of achieving desired environmental goals.
- Opportunities for public participation were of variable quality and inclusiveness. Industry, commercial interests and road users tended to be better represented than environmental and other public interest groups.

- Monitoring measures were generally insufficient to assess whether the strategies were achieving intended environmental outcomes.

In considering these findings, it needs to be emphasised that the RLTSs selected as case studies were not prepared using SEA. The strategies were also prepared before the introduction of the NZTS and LTMA. The SEA checklist was applied retrospectively as a means of examining existing practice and identifying opportunities for SEA integration in future RLTSs to assist councils meet new legislative requirements.

The results suggest environmental assessment in future RLTS processes could be significantly enhanced by SEA. Within the SEA tool kit, there is a range of methods and tools that could be used to strengthen RLTS development. These include established techniques that are widely used internationally. Drawing on methods best suited to domestic requirements and recognising regional variations, a 'made in New Zealand' approach to SEA could be developed for RLTS purposes.

While this report focuses primarily on environmental assessment, SEA provides a framework that can be adapted to address the social impacts of transport. Given the legislative requirements for RLTSs to take into account a range of social considerations such as access, mobility and public health, SEA could usefully be extended to include these issues.

More broadly, SEA can also be seen as an entry point for sustainability appraisal in support of sustainable development. Sustainability appraisal is an evolving framework for considering the economic, environmental and social impacts of policies and plans. SEA can be seen as a pathway towards sustainability appraisal.

To facilitate the understanding and use of SEA within the transport policy and planning community, the following steps are recommended:

- **Piloting SEA**

To provide an opportunity for 'hands on' experience and build familiarity with methods and tools, a recommended next step is to pilot the application of SEA in an RLTS process. In addition to building the skills of council staff, the pilot would assist in identifying resource and other requirements to support SEA application in future RLTS reviews.

- **Building SEA capacity**

To enhance the resource and skill base necessary for effective SEA, central government, through the Ministry of Transport and/or Land Transport New Zealand, could assist by developing guidance on SEA application and ensuring supporting elements necessary for effective practice are in place. Key elements include baseline environmental data and headline indicators to measure progress towards sustainability objectives.

- **Integrating land use and transport planning**

An integrated approach to land use and transport planning has the potential to play a key role in delivering sustainable transport outcomes. Previous research in this area has suggested there is a lack of integration between land use and transport planning processes in New Zealand. While SEA provides a platform for enhancing integration, it is possible that existing administrative and legislative arrangements present barriers to an integrated approach. Further research is needed to clarify the relationship between land use and transport planning processes and identify how closer links can be made.

- **Enhancing opportunities for public participation**

Within SEA, public participation is seen as playing a key role in integrating the environment into decision making. While the importance of public participation has been recognised in recent amendments to the Land Transport Act 1998, anecdotal evidence suggests there is a very low level of awareness of the Act's participation provisions. Given the central role of public participation in ensuring environmental considerations are taken into account, efforts to enhance community involvement warrant further attention. The success of such efforts will, in turn, play a key role in delivering on the sustainability objectives of current legislation.

## **Abstract**

Strategic environmental assessment (SEA) is gaining increasing international recognition as a means of ensuring environmental impacts are considered in transport policy and plan making. To date, experience of SEA in New Zealand has been limited. However, the introduction of the New Zealand Transport Strategy and the Land Transport Management Act 2003 has strengthened the obligations on central and local government to address the environmental impacts associated with transport. Regional councils are now required to prepare regional land transport strategies that take into account environmental sustainability and contribute to a sustainable land transport system. By providing a stronger framework for environmental assessment, SEA can assist councils in meeting these obligations.

Analysis done in 2004-2005 of strategy preparation in three case study regions highlights key areas where environmental assessment can be improved. The analysis shows approaches to environmental assessment in past strategy development have been limited. Results suggest that SEA has the potential to assist in significantly improving future processes. Within the SEA tool kit is a range of methods that can be used to strengthen RLTS development. To facilitate the understanding and effective use of these methods, central government could usefully assist by providing guidance and support for SEA application.

## **1. Introduction**

### **1.1 Purpose of this report**

Over the last decade, strategic environmental assessment (SEA) has gained increasing international recognition as a means of ensuring environmental impacts are considered in transport policy and plan making. To date, experience of SEA in New Zealand has been limited. However, recent policy and legislative changes highlight the need to develop a more systematic approach to environmental assessment in transport planning.

With the introduction of the New Zealand Transport Strategy (NZTS) and the Land Transport Management Act 2003 (LTMA), the obligations on transport planning agencies to address the environmental impacts associated with transport have been strengthened. Transport planning agencies are now required to prepare programmes and strategies that take into account environmental sustainability and contribute to a sustainable land transport system. By providing a stronger framework for environmental assessment, SEA can assist in meeting these obligations.

This report presents the results of research carried out to identify SEA methods appropriate for use in the preparation of regional land transport strategies (RLTSs). Using the Canterbury, Waikato and Wellington regions as case studies, the report examines the RLTS development process and identifies opportunities for incorporating SEA approaches into future RLTS preparation.

The key objectives of the report are to:

- identify opportunities for SEA use in regional land transport strategy preparation,
- assist regional councils and Land Transport New Zealand (LTNZ) meet the requirements of the LTMA,
- contribute to the delivery of the sustainability objectives of both the LTMA and NZTS.

The research undertaken for the report was carried out between July 2004 and April 2005 as part of LTNZ's 2004/2005 Research Programme.

### **1.2 Background to research**

As part of Transfund New Zealand's<sup>1</sup> research programme for 2003/2004, research was carried out to explore the use of SEA overseas and its potential application to New Zealand transport planning (Sadler et al. 2004). The results of the research identified the RLTS preparation process as a key entry point for SEA in New Zealand. This report is designed to provide practical suggestions for integrating SEA into future strategy development processes.

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<sup>1</sup> Transfund New Zealand is part of Land Transport New Zealand from 2004.

### **1.3 Approach to research**

The research has involved five main stages.

- In stage one, the researchers examined the development of RLTSs in the three case study regions (Canterbury, Waikato and Wellington). This stage sought to identify the processes and methods used in RLTS development.
- In stage two, the researchers compared the RLTS development process with a typical SEA process. This stage sought to identify areas where SEA approaches could be used to enhance future strategy preparation.
- In stage three, recommendations for integrating SEA methods into RLTS development were drafted. The recommendations and results of the analysis undertaken in stage two were made available for peer review.
- In stage four, a workshop was held with regional council staff and representatives of transport planning agencies to discuss the potential use of SEA methods in RLTS development. The workshop was designed to provide the opportunity for members of the transport policy community to provide input into and critical comment on the draft research results.
- In stage five, the research results were compiled into a report, taking into account feedback from the workshop. The report was peer reviewed to ensure accuracy and consistency with the research objectives.

### **1.4 Structure of report**

The research results presented in this report are organised as follows:

- Chapter 1 outlines the purpose of and background to the research project.
- Chapter 2 provides an overview of the previous research project and introduces the framework used to analyse the RLTS development process, exploring opportunities for the use of SEA.
- Chapter 3 presents the results of the analysis of RLTS development in the three case study regions.
- Chapter 4 identifies practical SEA methods and techniques that could be used to enhance environmental assessment in future RLTS preparation.
- Chapter 5 presents the report's conclusions and recommendations.

## 2. Exploring opportunities for SEA

*The ultimate aim of SEA is to help to protect the environment and promote sustainability* (Therivel 2004, p.7).

### 2.1 Overview

This chapter provides an overview of SEA and briefly summarises the results of the previous research project. It then introduces the SEA framework used to analyse the RLTS preparation process and identify opportunities to integrate SEA into future strategy development.

### 2.2 Understanding SEA

Strategic environmental assessment can be described as a systematic and transparent process for analysing and addressing the environmental impacts of proposed policies and plans. In advanced applications, social impacts are also addressed opening the way to the wider application of SEA in support of sustainable development.

In essence, SEA is designed to provide information to support sound decision making, ensuring that environmental and related socio-economic considerations are taken into account. The International Association for Impact Assessment (2002) defines an effective SEA process as one that:

- informs planners, decision makers and the affected public on the sustainability of strategic decisions,
- facilitates the search for the best alternative,
- ensures democratic and credible decision making,
- leads to more cost- and time-effective environmental impact assessment at the project level.

Sadler (1998a) identifies the main aims and benefits of SEA as follows:

- To promote sustainable development by:
  - integrating the environment into decision making,
  - designing environmentally sustainable policies and plans,
  - considering environmentally sustainable options and alternatives.
- To strengthen and streamline project environmental assessment by:
  - identifying potential impacts and cumulative effects early,
  - addressing strategic issues related to the justification and location of proposals,
  - reducing the time and effort necessary to assess individual projects.

## 2.3 Opportunities for SEA in RLTS development

Within the international literature, a range of examples of SEA application in the transport sector can be found. These examples highlight the potential contribution SEA can make to sustainable transport outcomes by integrating the environment into transport policy and plan making.

Recent changes to the transport policy and legislative framework provide the opportunity to develop a more systematic approach to SEA in New Zealand. With the introduction of the NZTS and the LTMA, recognition of the environmental and social impacts associated with transport has been strengthened.

Environmental sustainability is one of the key objectives underpinning both the NZTS and LTMA. Transport planning agencies are now required to prepare programmes and strategies that take into account environmental sustainability and contribute to a sustainable land transport system. From an SEA perspective, these changes are notable as they require consideration of environmental impacts at the policy level where transport strategies are being developed.

Previous research has identified the RLTS preparation process as a key entry point for SEA in New Zealand's transport planning framework (Sadler et al. 2004). RLTSs provide one of the main mechanisms through which transport policy is set. They are mandatory planning documents and must be prepared by every regional council in consultation with the public.

The research in this report has been carried out to examine existing practice and identify opportunities for SEA integration in future RLTS development.

## 2.4 The SEA framework

Over the last decade, SEA practice has evolved rapidly. As the field has expanded, SEA performance criteria and good practice guidance have been developed. Drawing on these elements, the researchers developed an SEA framework and checklist to analyse the RLTS preparation and monitoring process.<sup>2</sup> The framework can be described as a set of key SEA components or process steps. It serves as a means of assessing how the environment was considered in RLTS development and identifying ways SEA could be used to improve future practice.<sup>3</sup>

The process steps are set out and summarised in Box 2.1. Many of the steps are similar to those commonly used in policy and plan making and will therefore be familiar to readers. In large part, the component steps of SEA mirror the steps that could be expected to occur in quality planning processes. However, the distinctive feature of SEA is

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<sup>2</sup> In developing the framework, the researchers have drawn primarily on the findings of the previous research report. The UK Department of Transport publication *Strategic Environmental Assessment Guidance for Transport Plans and Programmes* (2004) has provided an additional useful reference source.

<sup>3</sup> While outside the scope of this research, the framework could also be adapted to assess how socio-economic factors were considered in strategy development.



that it serves to focus attention on the environmental implications of decisions and highlights the importance of environmental sustainability.

**Box 2.1 The SEA framework.**

**Key components of SEA**

- Developing environmental objectives
- Scoping environmental issues
- Establishing an environmental baseline
- Consideration of alternatives
- Environmental assessment
- Quality review
- Decision making
- Environmental monitoring
- Public participation

**2.4.1 Developing environmental objectives**

One of the most widely acknowledged principles of SEA is that it should be guided by clear environmental objectives. The term 'objectives-led' is sometimes used to refer to this principle.

The use of environmental objectives is an important means of integrating the environment into decision making and expressing desired environmental outcomes. The objectives also set the framework for subsequent stages of strategy development.

Ideally, objectives should be developed with reference to both legislative requirements and to environmental objectives in other relevant policies and plans. Opportunities for public participation in the formulation of objectives should also be provided to ensure community aspirations are reflected in the goals set.

To assess the development of environmental objectives in the RLTS process, the case study analysis in Chapter 3 considers the following questions:

**Environmental Objectives Checklist**

- Were clear environmental objectives established and used to guide RLTS development?
- Were objectives developed with reference to environmental objectives in other relevant policies and plans?

**2.4.2 Scoping environmental issues**

Scoping is an integral component of both SEA and project level environmental impact assessment (EIA). At the strategic level, scoping should aim to identify the broad issues to be considered, including environmental and relevant socio-economic impacts, and possible alternative courses of action.

Part of the role of the scoping process is to identify constraints that may affect the SEA process. Potential constraints may include the time and resources available, which can impact on the choice of methods and the level of detail of analysis (Department of Transport (UK) 2004).

Scoping should also provide opportunities for public participation. Early involvement of the public at this stage can contribute to identifying key issues and information needs. Providing an open process also promotes transparency and accountability.

Terms of reference or a written report, often called a scoping report, are usually prepared to guide subsequent stages of environmental analysis.

To assess the scoping processes used in RLTS development, the case study analysis in Chapter 3 considers the following question:

**Scoping Checklist**

- Was a scoping process used to identify key environmental issues?

**2.4.3 Establishing an environmental baseline**

Effective SEA requires reliable information on the state of the environment. Baseline information plays an important role in informing planners, decision makers and the public about the nature and scale of current problems and is an essential reference point against which to predict and monitor environmental change (Therivel et al. 1992).

Useful sources of background information include national and regional state of the environment and monitoring reports.<sup>4</sup> While assembling baseline information should be a relatively straightforward process, in practice there may be difficulties in collecting appropriate and sufficient information. Where data gaps exist, they should be identified and efforts made to address them.

The case study analysis in Chapter 3 considers the following question:

**Environmental Baseline Checklist**

- Was information on the current state of the environment collected and used?

**2.4.4 Consideration of alternatives**

Identifying and comparing alternatives is a widely recognised component of SEA. It is also a common step in policy and plan making and is recognised in the Land Transport Act

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<sup>4</sup> In respect of information on social factors, sources such as the Index of Deprivation will be useful. The Index of Deprivation is published by the Department of Public Health, Wellington School of Medicine and Health Sciences. It can be found on the Ministry of Health's website at [www.moh.govt.nz](http://www.moh.govt.nz).

1998 (LTA). The Act requires regional councils to take into account the need to give early and full consideration to land transport options and alternatives (section 175(h)).

At the strategic level, the development of alternatives requires a range of information about prevailing environmental and socio-economic conditions. A preferred alternative is commonly selected by comparing the relative impacts of each alternative. In many studies, the preferred alternative will be the most closely examined and may be the only alternative to be considered in detail. However, it is not uncommon for several alternatives to be investigated at the same level of detail before selecting from among them.

Under a best practice approach, the alternatives considered should include a 'do nothing' option and a best practicable environmental option (BPEO).

The case study analysis in Chapter 3 considers the following questions:

**Consideration of Alternatives Checklist**

- Did the process identify alternatives to support the strategy's environmental objectives?
- Did the alternatives include a "do nothing" and a best practicable environmental option?

**2.4.5 Environmental assessment of impacts**

Environmental assessment is central to the SEA process. Typically, it includes two main stages: impact prediction and impact evaluation.

*Impact prediction*

Impact or effects prediction is aimed at identifying the likely environmental changes that may arise from a specific policy or measure. Ideally, the process should consider factors such as the magnitude of likely changes, the time period over which they will occur, whether they are permanent or temporary, positive or negative and whether there will be any cumulative effects. The distribution of effects should also be considered. Impacts on communities may be distributed differently depending on factors such as car ownership, income and location (Department of Transport (UK) 2004, p.19).

*Impact evaluation*

Impact evaluation is intended to determine whether or not a predicted effect is likely to be significant. Evaluation of an impact's significance can be based on criteria such as compliance with relevant environmental standards, compatibility with community views and aspirations and maintenance of carrying capacity.

Prediction and evaluation methods often involve a degree of uncertainty, particularly where information is limited and environmental impacts are difficult to predict. A good practice SEA process will acknowledge uncertainty and adopt a precautionary approach to decision making.

The case study analysis in Chapter 3 considers the following questions:

**Environmental Assessment Checklist**

- Was an environmental assessment carried out?
- Were methods used to analyse effects and evaluate significance clearly identified and appropriate?

**2.4.6 Quality review**

Quality review is one of the main ‘checks and balances’ built into the SEA process. Key objectives of quality review are to:

- assess the adequacy and quality of information,
- determine if the information provides a sufficient basis for decision making,
- check if information has taken account of public comment.

Within SEA, the quality review process often involves the review of a formal SEA report. Where a report is not produced, the review focuses on the quality of the environmental information used in the process.

The case study analysis in Chapter 3 examines the following question:

**Quality Review Checklist**

- Were quality assurance measures provided for in RLTS preparation?

**2.4.7 Decision making**

When the term ‘decision making’ is used in SEA, it is sometimes taken to mean the final approval or ‘sign-off’ on a policy or plan. However, a series of interim decisions will be made before this point. Of central importance to SEA is the way in which environmental information is treated at each stage of the decision-making process.

To ensure decision making is transparent, a good practice approach will ensure information is provided on the key decisions made throughout the process. In the RLTS context, this would include decisions made by the Regional Land Transport Committee (RLTC) and by others involved in analytical work to support strategy development.

The case study analysis in Chapter 3 examines the following question:

**Decision-making Checklist**

- Was environmental information taken into account and used to inform decision making?

**2.4.8 Environmental monitoring**

Monitoring plays an essential role in providing information on whether a strategy or plan is delivering desired environmental outcomes. It also assists in the early identification of unintended environmental impacts and provides information to update and fill gaps in baseline data, necessary to inform future strategy development.

Box 2.2 summarises the main benefits of monitoring as identified by the UK Department of Transport.

**Box 2.2 The role of monitoring.**

Effective monitoring can contribute to:

- Managing uncertainty
  - checking and adjusting strategy implementation,
  - identifying and managing unanticipated impacts,
  - testing the accuracy of environmental impact predictions.
- Improving knowledge
  - improving impact prediction methods and the quality of future SEAs,
  - updating or filling gaps in existing environmental baseline information,
  - keeping track of changes in the environment.
- Enhancing transparency and accountability
  - assisting in strengthening public involvement,
  - verifying information.
- Managing environmental information
  - structuring information from various monitoring and evaluation activities,
  - presenting monitoring information in a format appropriate for its purpose.

Adapted from Department of Transport (UK) 2004.

The case study analysis in Chapter 3 examines the following questions:

**Environmental Monitoring Checklist**

- Are clear monitoring measures, linked to the strategy's objectives, in place?
- Are monitoring measures adequate to meet environmental information needs?

**2.4.9 Public participation**

Public participation is an important means of integrating the environment into decision making and is a cornerstone of SEA. The public can be a valuable source of information

on potential environmental impacts and assist in identifying alternative courses of action. Public involvement also has a key role in promoting transparency and ensuring democratic and accountable decision making.

Performance criteria developed by the International Association for Impact Assessment (2002) recommend the SEA process should be designed to:

- inform and involve interested and affected public and government bodies throughout the decision-making process,
- explicitly address their inputs and concerns in documentation and decision making,
- provide clear, easily understood information and ensure sufficient access to all relevant information.

Public participation should be distinguished from consultation. Harding (1998) refers to consultation as a process where the public is informed about decisions that are likely to be made. While there is an opportunity for public feedback, this is typically restricted to commenting on the decisions proposed. In contrast, public participation processes are designed to facilitate active public involvement and ensure a two-way exchange of views between the community and decision makers (Harding 1998, pp.122-124).

Effective public participation processes will generally comprise a range of techniques, appropriate to the level and type of decision making. A wide range of techniques is available including:

- citizen advisory committees,
- public liaison groups,
- public meetings and forums,
- public submissions and hearings,
- seminars and workshops,
- surveys,
- internet-based forums.

Effective processes will also aim to ensure equal access to the decision-making process. Access to resources can affect the ability of different groups and individuals to take part in the process. Measures to address resource capacity issues are therefore important to provide all groups and individuals who wish to take part with the opportunity to do so.

The case study analysis in Chapter 3 examines the following questions:

**Public Participation Checklist**

- Were opportunities provided for public participation?
- Did public participation processes help to facilitate involvement?
- Were public interest groups with particular environmental and/or social concerns identified and involved?
- Were the views expressed by the public taken into account in decision-making processes?

## **2.5 Summary**

International experience has highlighted the potential contribution SEA can make to environmentally sustainable transport outcomes. While there is no single, standardised approach to SEA, there are common elements that can be identified within the international literature. Drawing on these elements, this chapter has outlined an SEA framework for analysing RLTS preparation.

Many of the steps discussed above are similar to those commonly used in policy and plan making and will therefore be familiar to readers. In large part, the component steps of SEA mirror the steps that could be expected to occur in quality planning processes. However, the distinctive feature of SEA is that it serves to focus attention on the environmental implications of decisions and highlights the importance of environmental sustainability.

In the following chapter, the results of the case study analysis of the Canterbury, Waikato and Wellington RLTSs are presented.

## 3. Case study analysis

### 3.1 Overview

As discussed, three RLTSs were selected as case studies for the purposes of this report. Selection of the strategies was informed by discussions with LTNZ, regional councils and members of the transport policy community. The three strategies chosen were the:

- Canterbury Regional Land Transport Strategy 2002-2007,
- Waikato Regional Land Transport Strategy 2002-2012,
- Wellington Regional Land Transport Strategy 1999-2004.

All three RLTSs were prepared from a 'zero base', where the existing strategy was set aside and the process begun anew. This chapter begins by outlining the policy and legislative context within which the RLTSs were developed. The general approach to strategy development in the three regions is summarised before a detailed analysis is presented.

### 3.2 Outline of RLTS preparation

#### 3.2.1 Legislative requirements

The RLTSs selected as case studies were developed under the requirements of the Land Transport Act 1998. (LTA) The Act requires an RLTS to be prepared by each region. Regional councils are responsible for appointing a Regional Land Transport Committee to prepare the RLTS.

Under the LTA, an RLTS must "not be inconsistent with" any regional policy statement or plan prepared under the Resource Management Act 1991 or with any national land transport strategy.<sup>5</sup> To monitor implementation of the RLTS, each council is required to prepare an annual monitoring report (section 182).

Before the Act's amendment by the LTMA in 2003, section 175(2) required every strategy to:

- (a) Identify the future land transport needs of the region concerned.*
- (b) Identify the most desirable means of responding to such needs in a safe and cost effective manner, having regard to the effect the transport system is likely to have on the environment.*
- (c) Identify an appropriate role for each land transport mode in the region including freight traffic, public passenger transport, cycling and pedestrian traffic.*
- (d) State the best means of achieving the objectives referred to in paragraphs (b) and (c) above.*

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<sup>5</sup> Preparation of a national land transport strategy is provided for under section 170 of the LTA. A strategy can be prepared at the discretion of the Minister of Transport. However, no national land transport strategy has been prepared under the Act to date. A draft NLTS was prepared and released for public comment in 1997. However, a decision was subsequently made not to proceed with the strategy.



*(e) Include any regional passenger transport plan that has been prepared by the regional council that has prepared the strategy.*

The LTMA repealed section 175(2) and introduced new requirements for RLTS development. Under the amended provisions, an RLTS must:

- Contribute to the aim of achieving an integrated, safe, responsive and sustainable land transport system.
- Take into account how the strategy:
  - assists economic development,
  - assists safety and personal security,
  - improves access and mobility,
  - protects and promotes public health,
  - ensures environmental sustainability.<sup>6</sup>

Among other things, every RLTS must also:

- Avoid, to the extent reasonable in the circumstances, adverse effects on the environment.
- Take into account the need to give early and full consideration to land transport options and alternatives.
- Take into account the need to provide early and full opportunities for public participation in strategy development.<sup>7</sup>

The LTMA also repealed section 176(1) relating to the review and currency of RLTSs. Prior to the introduction of the LTMA, section 176(1) stated:

*A regional land transport strategy prepared under section 175 must at all times be kept current for a period of not less than 3 years in advance but not more than 5 years, and may be renewed from time to time.*

The LTMA amended this section to read:

*A regional land transport strategy prepared under section 175 –*  
*(a) must, at all times, be kept current for a period of not less than 3 years in advance but not more than 10 years; and*  
*(b) may be renewed from time to time, but must be renewed at least once every 3 years.*

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<sup>6</sup> Special conditions apply to the Auckland RLTS. From 1 July 2004, the Auckland RLTS must not include any matters other than those specified in section 175(2) or any regional passenger plan under section 175(2)(k). In addition, it must not include reference to priorities or their prioritisation.

<sup>7</sup> Section 179 provides a list of those who must be consulted in the preparation of the RLTS. The list includes the public in the region, affected communities and Maori. It should be noted that a council is not required to consult if it has already consulted on the matter in the course of preparing its long-term council community plan (LTCCP) under the Local Government Act 2002 (LTA, section 179(4)). This means it is possible a specific consultation process may not take place during the RLTS preparation process.

### 3.2.2 Central government transport policy

At the time that preparation of the Canterbury and Wellington RLTSs began, central government policy was set out in the National Transport Statement (1998). The statement outlined the National Government's overall objective for transport, which was expressed as follows:

*The New Zealand transport system must contribute maximum benefit at minimum cost to New Zealand, consistent with sustainable development.*

This statement was designed to provide guidance for transport policy development but did not have any legal status. The introduction of the statement accompanied the release of *Better Transport, Better Roads* in December 1998 (MOT). This publication outlined proposals for a new road management system based on more direct road pricing. It suggested placing road management in specialist road companies responsible for the day-to-day management of the roading network, funding and investment decisions.

These proposals were the outcome of work undertaken by the Ministry of Transport over the previous five years. The aim of this work was to establish the 'true costs' of road use and explore ways of ensuring that road users met these costs directly. A number of discussion papers on transport pricing, road management and funding were released by the Ministry during the 1990s. *Better Transport, Better Roads* represented the culmination of the work.

The focus of the government on road pricing meant that little guidance was available to regional councils relating to environmental considerations. While legislation required RLTSs to have regard to the environmental impacts of the transport system, no specific guidance was provided by central government to assist councils in meeting this obligation. Regional councils were left to determine how the environment should be taken into account in strategy development. Together, the lack of guidance and proposed changes to the road management system placed RLTS development in an uncertain political climate.

With the change of government in 1999, development of a new transport policy began. This process resulted in the introduction of the NZTS in December 2002. Strategy development in the case study regions was completed prior to the introduction of the NZTS.

### 3.2.3 RLTS development process

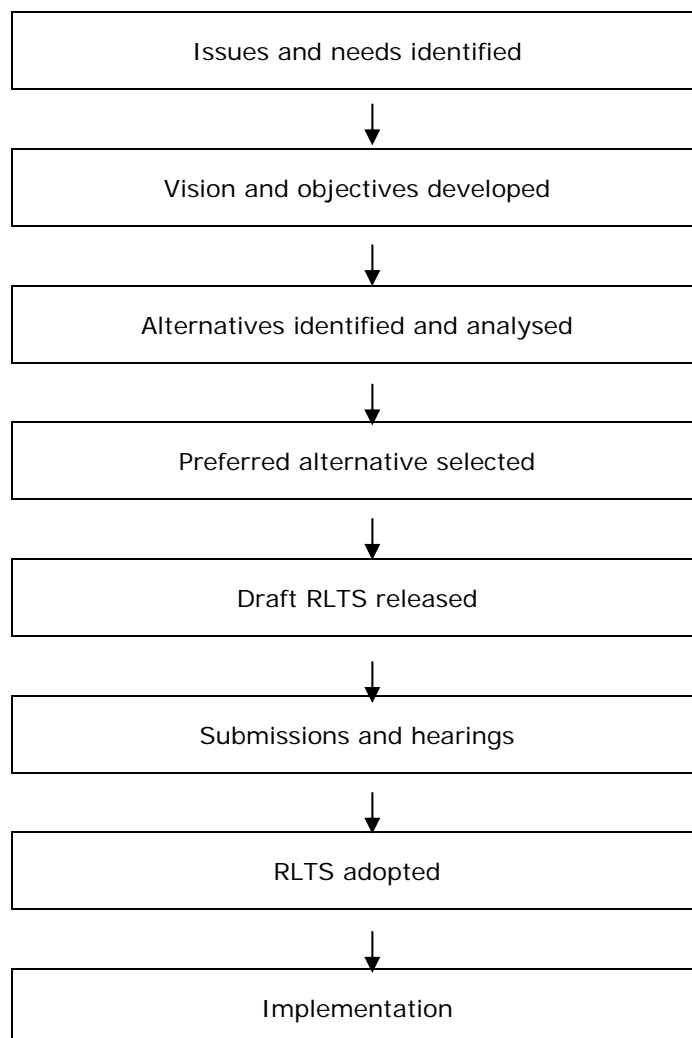
In broad terms, the Canterbury, Waikato and Wellington regions followed a similar process in preparing their RLTSs. The process was led by the RLTC, supported by council staff, technical and other working groups. The RLTC in each region included:

- the regional council,
- territorial authorities in the region,
- Transfund New Zealand,
- Transit New Zealand,

- Land Transport Safety Authority (LTSA),
- New Zealand Police,
- commercial road users,
- private road users,
- public transport users, cyclists and pedestrians.

The working groups comprised mainly officers from the regional council and territorial authorities in the region.

Figure 3.1 illustrates the main steps in RLTS development in the three regions. In summary, the process began with the identification of key issues and needs. A vision and objectives for the RLTS were then developed. This was followed by technical work to identify and analyse alternatives (or 'scenarios' as they were termed in Canterbury and Wellington).



**Figure 3.1 Overview of regional land transport strategy development process.**

In both Canterbury and Wellington, technical analysis relied to a significant extent on the use of computer modelling. In Waikato, computer modelling was not used, and instead, analysis was carried out using a paper-based assessment process.

In each of the three regions, analytical work was led by council staff. Once a preferred alternative was identified, a draft RLTS was prepared and released for public submissions and hearings. Following this process, a completed strategy was adopted by the RLTC and approved by the regional council.

The length of the process ranged from just over two years in Waikato to nearly four years in Canterbury. In Wellington, RLTS development began in early 1997 with a completed strategy adopted some 31 months later in September 1999 (Table 3.1).

**Table 3.1 Approximate timeframe of RLTS development.**

Region	Development commenced	RLTS adopted	Approximate time
Canterbury	June 1998	March 2002	45 months
Waikato	November 1999	May 2002	29 months
Wellington	February 1997	September 1999	31 months

A key influence in the length of the Canterbury process was the time taken to develop the vision and objectives. This stage of the process took around 18 months, mainly because the decision was to link it to a separate 'visioning' process for Christchurch city.

### 3.3 Analysis of RLTS development

An analysis of RLTS development in the three case study regions is presented below, using the SEA framework outlined in Chapter 2.<sup>8</sup> The RLTSs selected as case studies were not prepared using SEA, and were also prepared before the introduction of the NZTS and the LTMA. The SEA checklist was applied retrospectively as a means of examining existing practice and identifying opportunities for SEA integration in future RLTS development.

#### 3.3.1 Developing environmental objectives

##### ***Were clear environmental objectives established and used to guide RLTS development?***

Development of objectives took place at an early stage in the preparation of all three RLTSs. Desired environmental outcomes were variously expressed in strategy objectives, goals and in vision statements.

In Waikato and Wellington, similar vision statements were adopted. These were written as simple statements as follows:

##### **Waikato RLTS vision**

*A sustainable land transport system which meets the environmental, economic, social and cultural needs of the region* (Environment Waikato 2002, p.5).

<sup>8</sup> The appendix provides a detailed summary of the process used to prepare the Canterbury RLTS.

### Wellington RLTS vision

*A balanced and sustainable land transport system that meets the needs of the regional community* (Wellington Regional Council 2002, p.33).

In Wellington, the vision statement was supported by five objectives. 'Sustainability' was one of these objectives.<sup>9</sup> The aim of the objective was:

*To provide a land transport system that:*

- *operates in a manner that recognises the needs of the community,*
- *avoids, remedies or mitigates adverse effects,*
- *uses resources in an efficient way,*
- *supports an optimal demand for energy* (pp.34-35).

Similarly, in the Waikato RLTS 'environmental sustainability' was identified as one of four 'needs' or desired outcomes underpinning the vision statement. Two key goals were identified to support this 'need'. These goals were to:

- *Protect and enhance the physical environment,*
- *Protect and enhance people and communities* (p.7).

In Canterbury, desired environmental outcomes were reflected in both the vision and in the strategy's goals (Box 3.1).

#### **Box 3.1 Canterbury RLTS vision and goals.**

**Vision statement:** "Our vision is to have and enjoy the best possible quality of life".

#### **Goals**

- Goal 1 Equitable access for all sectors of the community.
- Goal 2 An efficient and sustainable transport system that supports a thriving economy.
- Goal 3 A transport system that promotes a social environment that is safe and supportive.
- Goal 4 A transport system that is consistent with a healthy, pleasant and pollution free environment.
- Goal 5 A transport system which is safe.
- Goal 6 A transport system that values and encourages community participation.
- Goal 7 Transport and land use planning are an integrated part of a process that takes account of wider community processes.
- Goal 8 A transport system that encourages innovation and is responsive to change.

*Source:* Environment Canterbury 2002, pp.11-14

While identifiable environmental objectives can be found in all three RLTSs, the objectives set were very broad in nature and the terms used were often not well defined. For example, one of the aims of the sustainability objective in the Wellington RLTS is to provide a land transport system that "supports an optimal demand for energy". However, this phrase is not defined in the strategy. Similarly, in the Waikato RLTS, there is little

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<sup>9</sup> The other four objectives were: accessibility and economic development; economic efficiency; affordability; and safety.

explanation of the goal statements to “Protect and enhance the physical environment” and “Protect and enhance people and communities”.

Notably, while all RLTSs adopt the term sustainability, little explanation is provided to help define the term. To an extent, this may reflect the relatively recent introduction of the concept of environmental sustainability in New Zealand’s transport policy and planning framework. With the Ministry of Transport’s focus on road pricing during the time that two of the three RLTSs were developed, there was little government guidance available to assist councils in developing policies supportive of sustainability.

***Were objectives developed with reference to environmental objectives in other relevant policies and plans?***

In all three regions, the RLTSs contain reference to the objectives and policies set in the regional policy statement (RPS). This can be seen as a reflection of the requirement contained in the LTA that the RLTS must “not be inconsistent” with the RPS.

Each region includes extracts from its RPS in an appendix to the strategy. Both the Wellington and Waikato strategies reproduce the RPS land transport policies and methods. An appendix to the Waikato RPS also provides a diagram showing links between the RLTS and other strategies and plans prepared under the RMA and LTA.

Other than the RPS, the main documents referred to in strategy development were mostly transport-related (e.g. road safety strategies, passenger transport plans). In Canterbury and Waikato, government strategies such as the New Zealand Biodiversity Strategy (NZ Government 2000) could have been usefully considered but do not appear to have been referred to.<sup>10</sup> Objectives within the Biodiversity Strategy relevant to land transport planning include:

- *Objective 1.2 - Integrate and use measures in the sustainable management of production lands and urban environments that are sympathetic to indigenous biodiversity.*
- *Objective 2.1 - Ensure that management mechanisms adequately provide for the protection of freshwater biodiversity from adverse effects of activities on land and in water.*
- Objective 3.3 – (paraphrased) Protect biodiversity in coastal waters from the adverse effects of human activities on land and in the coastal zone (NZ Government 2000).

In Wellington’s case, reference could have been made to the government’s Environment 2010 Strategy (MOE 1995), which was in place during the RLTS development process.

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<sup>10</sup> The New Zealand Biodiversity Strategy was introduced in February 2000. The Canterbury RLTS does note several other central government policies referred to in the process of RLTS development. They include the climate change programme, National Energy Efficiency and Conservation Strategy and the Vehicle Fleet Emission Control Strategy. The Vehicle Fleet Emission Control Strategy was used in Canterbury as a reference point in developing modelling assessment criteria. The Waikato RLTS contains a statement of support for the energy efficiency policies in the National Energy Efficiency and Conservation Strategy. The Strategy was released in September 2001 after objectives had been developed in both Canterbury and Waikato.

### 3.3.2 Scoping environmental issues

#### *Was a scoping process used to identify key environmental issues?*

A formal scoping process to identify environmental issues did not appear to be part of strategy development in any of the three regions. While some initial work was done to establish a framework for RLTS development, this work did not have a strong environmental focus.

In Wellington, in the early stages of RLTS preparation, terms of reference were drawn up to outline the strategy development process. The terms of reference document set out the tasks to be completed. Within the document, however, there was only one explicit reference to environmental considerations. This was included in a list of 'Issues' and read:

*How can the land use/transport system be developed to minimise environmental concerns relating to greenhouse gas emissions, use of non-renewable fuels and effect on the environment, e.g. noise and run-off?* (Wellington Regional Council undated.)

While this question was asked, the terms of reference did not identify how it would be addressed in the strategy development process or what information would be required to answer it.

In Canterbury, some initial issue identification work was undertaken but this work did not progress to a formal scoping stage. Where environmental issues were identified, the information provided was generally limited in detail.<sup>11</sup>

In Waikato, some information on environmental issues was collected and presented in a *Transport Baseline Data and Regional Overview* report (Environment Waikato 2000a). This report provides a two page summary of environmental issues identified as:

- air quality,
- water quality,
- noise,
- debris and spillage,
- hazardous substances,
- energy use in the transport sector.

Each issue is summarised in one to two paragraphs. Reference is also made to studies carried out by the council in previous years.<sup>12</sup> Public submissions on the report were subsequently invited and the issues were discussed at four regional workshops. While this

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<sup>11</sup> Despite the absence of a scoping process, the completed Canterbury RLTS states: "Adverse environmental effects from transport are widespread. There is widespread concern over community severance, traffic noise, vehicle emissions (such as carbon dioxide (CO<sub>2</sub>)), smoky vehicles, and the degrading of the urban environment from traffic growth" (Environment Canterbury 2002, p.1). While this statement may reflect a commonly held view, it appears to be a general statement rather than one based on a comprehensive scoping and environmental assessment process.

<sup>12</sup> Earlier studies focused on stock truck effluent, the transport of hazardous substances and vehicle exhaust emissions.

process did allow for some further issue identification, there was no indication of how the issues raised would be addressed in RLTS development.

### 3.3.3 Establishing an environmental baseline

#### ***Was information on the current state of the environment collected and used?***

As indicated above, for the most part only limited information on environmental issues was collected and used in the RLTS development process. In Waikato, existing data was presented in the *Transport Baseline Data and Regional Overview* report. As noted, this report provided a two-page summary of environmental issues and references to earlier studies on stock truck effluent, the transport of hazardous substances and vehicle exhaust emissions. Noise and water quality were also identified as environmental issues associated with transport but no specific data was presented on their impacts.

In Canterbury, data collection focused on general transport statistics such as vehicle ownership, traffic flows and public transport use. Some information was collected on land area covered by roads, fuel use and carbon dioxide (CO<sub>2</sub>) emissions. Data on the latter showed CO<sub>2</sub> emissions in Canterbury had increased by 98% between 1982 and 1997. Other information on air quality data was available for Christchurch and for some regional centres but was not used to establish an explicit environmental baseline.<sup>13</sup>

No data appear to have been collected to establish impacts on water quality resulting from stormwater run-off from the transport network.<sup>14</sup> Given urban stormwater in Christchurch city is directed into the Avon-Heathcote Estuary, an area which has a high ecological value and recreational use, water quality data could reasonably have been expected to be collected. However, the impact of motor vehicles on stormwater was not separately studied in the Canterbury process.

In Wellington, some data on air and water quality were collected by the council's resource investigations department. In respect of water quality, the department carried out a limited study which sampled one site over a four month period. The study concluded:

*Overall the quality of stormwater emanating from the motorway surface investigated in this study indicates that there would not be any adverse effect on aquatic ecosystems (Wellington Regional Council June 1998a, p.9).*

While the analysis found levels of contaminants in the samples were within recommended levels, it is not clear whether issues relating to the bioaccumulation of contaminants were considered or whether the site was representative.

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<sup>13</sup> Air quality data was available from the five monitoring sites in the city and sites in Timaru, Ashburton and Rangiora. The sites, originally established in response to concerns about deteriorating air quality due to domestic fires, measure particulate matter (PM), sulphur oxides and carbon monoxide (CO). At two of the Christchurch sites, nitrogen oxides (NOx) are also measured. It is estimated that approximately half the CO and the majority of NOx is from motor vehicles. Vehicles also contribute to the PM load.

<sup>14</sup> Motor vehicle use and roads can contribute potentially toxic substances into stormwater systems, including metals such as copper, chromium, nickel and cadmium.



The department also carried out air quality monitoring to provide data for the RLTS process. This involved monitoring carbon monoxide (CO) emissions at two locations within Wellington city. CO monitoring data for three other sites, previously collected by the National Institute of Water and Atmospheric Research (NIWA), was also obtained.

Data results showed two sites were producing CO and associated emissions exceeding or close to international health standards and above or close to acceptable levels stated in the council's Proposed Regional Air Quality Management Plan.<sup>15</sup> While these two sites were later adopted as indicator sites to measure the RLTS air quality target, it is not clear how this information influenced decisions relating to the identification of alternatives in strategy design.

Given regional councils are required to prepare annual reports on RLTS implementation, the expectation was that environmental monitoring data would have been more readily available. However, monitoring data in all three regions appeared to be limited. Monitoring is discussed in more detail in Section 3.3.8 below.

### **3.3.4 Consideration of alternatives**

#### ***Did the process identify alternatives to support the strategy's environmental objectives?***

In all three regions, RLTS development included processes to identify alternatives. In Canterbury and Wellington, a similar approach to identifying alternatives was used. In both regions, the process began with the development of 'extreme' scenarios. These scenarios comprised simplified, single option approaches to transport. In Canterbury, the single option scenarios were termed 'cartoon strategies' to underline their conceptual rather than 'realistic' character.

Table 3.2 outlines the single option scenarios used in Canterbury. A similar list of options was used in Wellington (Table 3.3).

Each of the initial "extreme" options contained a set of specific transport projects and/or policies chosen to address identified congestion points. For example, in Wellington the "free flow roading" option comprised a set of existing and new roading projects, including some controversial developments such as the Inner City Bypass and Transmission Gully.<sup>16</sup>

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<sup>15</sup> The sites are the Vivian/Victoria Streets intersection and the Willis/Manners Streets intersection.

<sup>16</sup> According to the modelling reports, road projects were chosen based on "their ability to alleviate traffic congestion and work to produce a free flow of traffic on modelled roads" (Wellington Regional Council November 1998b, p.4). However, the process used to select the individual projects included in each alternative is unclear. Council files indicate projects were identified with input from members of both the technical working group and the modelling working group but do not record in detail the basis for selection.

**Table 3.2 'Extreme' options modelled in the Canterbury RLTS preparation process.**

Option	Description
Do minimum	Committed schemes and existing services only.
Cars – free-flow roading	Build and manage roads and related infrastructure to provide for all car demands.
High quality public passenger transport (buses/taxis only)	A public passenger transport-based strategy where public passenger transport is given priority over all other modes.
High quality public passenger transport (including rail)	A public passenger transport-based strategy which includes a number of rail-based initiatives.
Cycle dominant	A strategy based on making cycling a dominant mode.
Pedestrian dominant	A strategy based on making pedestrian traffic a dominant mode.
Concentrated land use	A strategy which uses more concentrated urban forms as the primary transport tool.
Full marginal cost pricing	A strategy that seeks to ensure that all modes pay the full marginal cost of use, including congestion costs.
Demand management – regulation including strong parking management	A range of measures to reduce or change demand patterns based around restraints, regulation or charges.
Demand management – education and advocacy only	A range of measures to reduce or change demand patterns based around education and advocacy.
<i>Source:</i> Environment Canterbury 2004b, p.77.	

**Table 3.3 'Extreme' options modelled in the Wellington RLTS preparation process.**

Option	Description
Do minimum	Committed schemes and existing services only.
Free-flow roading	Provide sufficient road capacity to meet demand at all times.
Improved roading	Provide sufficient road capacity to meet off-peak demand and targeted improvements to remove local peak period bottlenecks.
Modern public transport systems	Provide high quality public transport systems (including new methods like light rail) and implement pricing, parking levies and land-use policies supportive of public transport.
Removal of operational subsidies	Undertake investment either for road or passenger transport to meet demand subject to available capital. All passenger subsidies on transport are removed.
Improved public transport systems	Enhance the existing public transport system through bus priority systems and improved interchanges with some road capacity restraints imposed.
Mixed investment	Improve roading and improve public transport systems
Low fares	Enhance the public transport system through higher frequencies and low fares with selective road improvements and parking controls.
Decentralisation	Similar to the "mixed investment" option but with a strong emphasis on developing the sub-regional centres at the expense of Wellington.
Economically efficient pricing	Based on the "mixed investment" option but with a pricing regime that reflects the true costs of travel, including congestion and externalities.
Laissez faire	Any projects qualifying for funding are built.
<i>Source:</i> Wellington Regional Council 1999d, p.18.	

In both Canterbury and Wellington, computer modelling was used to assist in identifying the likely outcomes of each option.<sup>17</sup> In essence, the modelling process was used to move from unrealistic, single options to a preferred combination of options. The first stage of the modelling process concluded that no single option performed well against all criteria used (see Section 3.3.5). As a result, combinations of options were modelled in subsequent stages until a 'preferred' option was identified.

In both regions, the approach to identifying alternatives could be described as reactive rather than proactive. Alternatives were identified primarily in response to existing problems, such as traffic congestion, rather than as a way of achieving the RLTS objectives. In the modelling process, RLTS objectives were used mainly to develop criteria to assess the results of model runs rather than to lead the identification of alternatives.

This approach potentially limited planners' ability to identify alternatives supportive of the strategy's environmental sustainability objectives. For example, alternatives supporting the RLTS's environmental goals could have been expected to give a high priority to land use planning alternatives. The process could have considered land use alternatives requiring changes in residential and industrial development to reduce or possibly eliminate motor vehicle trips. While the Canterbury process did include a 'concentrated land use' option in its initial 'cartoon' strategies, this was effectively set aside in subsequent stages of RLTS development.<sup>18</sup>

Council files suggest land use planning and demand management options may have presented a challenge to a process that has traditionally centred on the provision of road networks. There is some acknowledgment of this in documentation relating to the Canterbury RLTS process. Commenting on the options explored in the modelling stage of strategy development, the council notes a 'car restraint' option is likely to be "the most difficult to assess as it represent[s] a quantum shift from current direction" (Environment Canterbury 2004b, p.79).

Waikato used a different approach to identify alternatives from that followed in Canterbury and Wellington. In the Waikato process, computer modelling was not used. Instead, a series of transport options was developed by working groups and presented in an 'options paper'. The options paper was then distributed for public feedback.<sup>19</sup> The paper identified a mix of broad policy approaches under each objective. For example, options relating to the strategy's environmental sustainability objective included a "policy/regulatory approach", "advocacy approach" and "advisory/education approach"

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<sup>17</sup> The transport models relied primarily on population census data, traffic counts and a model of the transport network to predict the performance of each option.

<sup>18</sup> The concentrated land use option may have been set aside as it was not seen as an option able to be delivered by the RLTS. The draft assessment report on the cartoon strategies notes the "[concentrated land use] strategy is different from the other strategies in that the outcomes can not be b[r]ought about by the transport providers involved in the Region" (Environment Canterbury May 2000, p.19). This comment also points to a lack of integration between land use and transport planning processes.

<sup>19</sup> The options paper provided a questionnaire inviting respondents to use a ranking system to identify their preferred option. Respondents were asked to allocate 100 points between options to record their preferences. These preferences were reported in a separate document. Waikato is unique in this respect in providing for some degree of public input into the selection of preferred options.

(Table 3.4).<sup>20</sup> However, no analysis of the different approaches is presented to assess their relative contribution to the environmental sustainability goal.

**Table 3.4 Waikato RLTS: options for achieving the environmental sustainability objective.**

<b>Option</b>	<b>Description</b>
<b>Option 3.1</b>	<p><b>Policy/regulatory approach</b></p> <ul style="list-style-type: none"> <li>• The Resource Management Act provisions will be used to deal with the adverse effects of transport.</li> <li>• Policies, rules and methods can be built into district plans (for issues such as noise, urban form, forestry harvesting) and regional plans (for issues such as stormwater run-off, stock truck effluent disposal and land disturbance).</li> </ul>
<b>Option 3.2</b>	<p><b>Advocacy approach</b></p> <ul style="list-style-type: none"> <li>• Central government will be encouraged to introduce new measures to address the environmental effects of transport. An example of such measures could be new regulations for smoky vehicles.</li> <li>• Develop and implement land use and planning guidelines.</li> </ul>
<b>Option 3.3</b>	<p><b>Advisory/education approach</b></p> <ul style="list-style-type: none"> <li>• Players in the transport sector will be encouraged through education to minimise their adverse environmental effects.</li> <li>• An example of this is through the use of the national code of practice for the minimisation of stock truck effluent.</li> <li>• Provide for greater awareness of stock crossings in rural areas.</li> <li>• Travel demand will be reduced by changing behaviour.</li> </ul>
<b>Option 3.4</b>	<p><b>Research/investigation/monitoring approach</b></p> <ul style="list-style-type: none"> <li>• Changes in the physical and social environment will be monitored to identify trends/changes.</li> <li>• Use of strategic forward planning through strategy studies. Use of industry data.</li> <li>• Environmental/transport performance indicators will be developed and used.</li> <li>• Alternative transport modes (i.e. electric cars).</li> </ul>
<b>Option 3.5</b>	<p><b>Incentive/encouragement approach.</b></p> <ul style="list-style-type: none"> <li>• Use of incentives, e.g. use of financial incentives to make passenger transport, cycling and walking more attractive.</li> </ul>
<i>Source: Environment Waikato December 2000, p.11.</i>	

#### ***Did the alternatives include a 'do nothing' and a BPEO?***

All three regions included 'do nothing' or 'do minimum' options in the range of alternatives considered. In Waikato, 'do nothing' or 'status quo' options were included among the range of approaches identified in the options paper. In both Canterbury and Wellington, a 'do minimum' alternative was used in the modelling and evaluation process as a reference point against which other options were measured. Modelling of the 'do minimum' option was also used to identify future congestion areas on the network.<sup>21</sup>

However, no evidence was found in any region of efforts to identify a best practicable environmental option (BPEO). Reports on Canterbury's modelling process state that there was "very little difference" between options in the final round of modelling. Similarly, in Wellington modelling found "little difference between options" in terms of both the strategy's sustainability and safety objectives.

<sup>20</sup> The options paper did not identify specific road construction or maintenance projects. In the completed RLTS, projects appear only in an appendix.

<sup>21</sup> These areas were identified by general locations and specific site (e.g., road name).

In the Waikato RLTS process, there is no indication that a specific environmental assessment of the options was carried out or that a BPEO was identified. The broad policy approaches identified in the options paper do not appear to have been subject to any formal environmental assessment process.

### **3.3.5 Environmental assessment**

#### ***Was an environmental assessment carried out?***

As noted above, in the Waikato process no evidence was found that a specific environmental assessment was carried out of proposed options or the preferred alternative. In both Canterbury and Wellington, environmental assessment was restricted to the modelling stage of the RLTS process. At the point where a preferred alternative was selected, no further environmental assessment was undertaken.

In the Canterbury process, modelling results were assessed against a set of criteria derived from six of the strategy's eight goals. The goals of 'community participation' and 'innovative and responsive to change' were not included as they were considered to be process goals. Table A2 in the appendix outlines the assessment criteria used.

Many of the assessment criteria measured traditional time-cost factors (e.g. total vehicle minutes, travel times on specific routes, combined costs of travel time). Three criteria were identified under the 'physical environment' goal. These were:

- global pollutants, measured by CO<sub>2</sub> emissions,
- localised pollutants, measured by CO emissions,
- quality of urban environment, measured by the degree of emphasis on car use.

In Wellington, modelling reports also show three criteria were used to assess the environmental performance of the options modelled. These were identified as:

- environment, measured by total CO and CO<sub>2</sub> emission levels,
- fuel, measured by the expected change in fuel consumption,
- severance, measured by the amount of new/modified road expected under each option.

Other commonly recognised effects of land transport, such as noise, impacts on biodiversity and water quality, do not appear to have been considered to any significant extent in either region.

Interviews with council staff suggest one of the reasons for the limited approach to environmental assessment was the assumption that environmental impacts would be adequately considered when resource consent applications were made under the RMA. This led to the view that there was no need to undertake a comprehensive environmental assessment during RLTS development as environmental issues would be addressed at a later stage.

Another factor identified in interviews was the lack of resources to develop a comprehensive approach to environmental assessment. With a finite time and budget,

environmental assessment tended to focus on factors that could be readily assessed such as CO and CO<sub>2</sub> emissions. Staff also indicated there was a view that some issues, such as vehicle emission standards, would be better addressed at a national level rather than through the RLTS. It was felt there was limited scope to address such issues on a regional basis. They were therefore set aside.

***Were the methods used to analyse effects and evaluate significance clearly identified and appropriate?***

Canterbury and Wellington also used a similar approach to analysis and evaluation. In both regions, analysis and evaluation was undertaken by small 'expert' groups comprised largely of transport planners and engineers. There appeared to be little input from other experts with skills in environmental or social impact assessment, potentially limiting the breadth of knowledge that could have been brought to the process.

While expert groups are commonly used in evaluation processes, problems can arise when the evaluation criteria the group uses are not clearly defined and explained. Clear definitions are particularly important when comparative evaluations are being made using qualitative information. Without clear definitions, it can be difficult for group members to base their assessments on a common understanding. In qualitative assessment, this is a particular issue as different participants bring different understandings to the task.

Lack of clarity in criteria may have affected the assessment process in both Canterbury and Wellington. The use of the term "severance" provides an example. Tate defines severance as "...the divisive effects that result from the provision and use of transport infrastructure" (Tate 1997, p.7). These effects arise from traffic flows and become more pronounced as flows increase, peak periods lengthen and multi-laning is introduced. The issue is complex and involves both:

- Physical severance - the direct effect resulting from the need to travel additional distance or additional time to traverse a barrier.
- Psychological severance - the indirect effect resulting from the relationship between barrier effects and feelings of being "cut off" (ibid. pp.17-20).

Severance is a widely recognised effect of transport. However, limited information was presented to establish a common understanding of the term or to identify threshold levels for severance effects in either Canterbury or Wellington.

Potential problems arising from the lack of clarity of assessment criteria can also be illustrated by Canterbury's qualitative assessment criteria which included similar terms such as "pleasant urban environment" and "quality of urban environment" (Box 3.2).

Another term, "consolidated urban form", could be judged to be either complementary to or incompatible with the above.

**Box 3.2 Qualitative criteria in the Canterbury RLTS.**

- Facilities for transport disadvantaged
- Pleasant urban environment
- Severance
- Free from crime
- Sense of community
- Exposure to weather in walk/wait times
- Facilitates social interaction
- Quality of urban environment
- Consistency with other planning documents
- Consolidated urban form

A further issue arising from the assessment process relates to the mix of both quantitative and qualitative assessment criteria. Undertaking evaluations involving a mix of quantitative and qualitative criteria can be difficult. In both Canterbury and Wellington, staff presented results by using a simple scale (+, 0, -). The scale is illustrated in Table 3.5 which shows outcomes of the stage one modelling process in Wellington.

**Table 3.5 Wellington RLTS: comparison of four 'extreme' options against strategy objectives.**

Objective	Scenario			
	Free Flow Roading	Modern Public Transport	Efficient Pricing	Low Fares
<b>Accessibility</b>				
• Car	++	-	--	--
• Public transport	0	++	--	+
<b>Economic Development</b>	++	0	--	-
<b>Safety</b>	0	0	++	0
<b>Economic Efficiency</b>	?	?	--	?
<b>Affordability</b>				
• User	0	0	--	+
• Funding	--	+	++	--
<b>Sustainability</b>				
• Environment	-	++	++	+
• Fuel	-	+	++	0
• Severance/other	--	0	++	0
<b>Key:</b> + positive (from low to high) 0 neutral - negative (from low to high)				
<i>Source:</i> Wellington Regional Council November 1998b, p.20.				

The use of a simple, qualitative scale has advantages as it avoids the problem of ascribing too much certainty to computer generated values. However, this type of approach relies heavily on decisions made by the 'expert' group and often involves a significant degree of subjective judgement. It is therefore important that the reasons for weightings are clearly identified and assumptions underlying decisions explained and recorded. In both

Canterbury and Wellington, there is little documentation detailing the evaluation process or the assumptions underlying the expert group weightings.

### **3.3.6 Quality review**

#### ***Were quality assurance measures provided for in RLTS preparation?***

A formal quality review process was not part of RLTS development in any region. However, while there was no formal review process some limited types of informal, peer review did take place.

In the Canterbury process, regional and city council staff were invited to review papers and calculations at various times in the process. In Wellington, external consultants were asked to comment on aspects of the technical work. Council files also show the Ministry of Transport made comments on the strategy's compliance with the requirements of the LTA.

In Waikato, the former chair of the RLTC was asked to review the draft RLTS and comment on the likely acceptability of different policy approaches. External consultants were also used to peer review the options paper and associated documentation. In addition, Waikato produced an 'assessment report' documenting the steps it had taken in preparing the RLTS. However, this report was intended to demonstrate compliance with the requirements of the LTA rather than provide a formal quality review.

In all three regions, the main opportunity for some type of external 'check' was through the public submission and hearings process that took place once a draft RLTS was released. However, this process was aimed primarily at gauging comment on the content of the draft RLTS rather than the adequacy of strategy development. No region provided a specific process to review the environmental information used in strategy development.

### **3.3.7 Decision making**

#### ***Was environmental information taken into account and used to inform decision making?***

Decision making can be described as the process of choosing between alternative courses of action. It involves weighing benefits and disadvantages and making choices from a range of options. The role of SEA is to bring information to the process to facilitate environmentally sound decision making.

Given the limited environmental assessment work undertaken in RLTS development, it is questionable whether sufficient information was available for decision making. Gaps in baseline data and the small number of environmental factors used to assess alternatives suggest the process could have been enhanced by access to a wider range of environmental information sources.

Where environmental information was available, it is not always clear how it was used to inform decisions. In all three regions, decisions were made at intervals by council staff,



technical working groups and by the RLTC.<sup>22</sup> From council records, it is often difficult to establish the basis and rationale for decision making at each stage in the process. Generally, RLTC meeting minutes do not record the discussions or debates which preceded decision-making. RLTC workshops, where issues were further discussed, were unlikely to be recorded in any detail. Similarly, technical working group meetings were often not minuted in full.

In Canterbury, draft reports of the modelling process provide some information about the basis for decisions at this stage. However, no final reports were prepared documenting the process in full. In Wellington, modelling reports were published. However, the basis and rationale for decisions is not always made explicit in the reports.

In Waikato, the council's practice of publishing reports at various stages helped in understanding the process steps. Reports published included:

- Transport Baseline Data and Regional Overview (2000a),
- Submissions on the Transport Baseline Data Report (2000b),
- Key Issues and Proceedings from RLTS Workshops (2000c),
- Transport Options for the Waikato Region (2000d),
- Submissions on Transport Options for the Waikato Region(2001a),
- RLTS Assessment of Means: Section 175(2)(b) Assessment: Assessment of Proposed Regional Land Transport Strategy (2001c).

However, while the reports document the process, little information is provided on how environmental data was used to inform decision making. As noted previously, Waikato did not undertake a specific environmental assessment during strategy development.

### **3.3.8 Environmental monitoring**

#### ***Are clear monitoring measures, linked to the strategy's objectives, in place?***

Development of indicators and targets to monitor RLTS implementation followed different approaches in each of the three regions.

In Wellington, indicators and targets were developed early, after the strategy's objectives had been set. Initial work to identify indicators for each objective was undertaken by external consultants.<sup>23</sup> This work resulted in approximately 145 possible indicators being identified for the strategy's five objectives.

To measure progress towards the strategy's environmental sustainability objective, performance indicators initially adopted by the RLTC covered:

- freshwater,
- coastal water,
- air quality,

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<sup>22</sup> The final approval authority for the RLTS is the regional council.

<sup>23</sup> Consultants included Hill Young Cooper Ltd., Opus International Consultants, and Pinnacle Research.

- human health (specifically noise),
- environmentally friendly modes,
- transport and land use.

However, during the strategy development process this list was substantially reduced. In the completed RLTS, just two performance indicators are identified relating to CO emissions and fuel consumption (Table 3.6). The fuel consumption indicator acts as a proxy for CO<sub>2</sub> emissions.

**Table 3.6 Wellington RLTS sustainability targets and performance indicators.**

Target	Performance Indicator
Non compliance with CO guidelines in 2004 does not increase by more than 2.5% over 1999 levels at Vivian and Willis Streets junction	CO emission levels at Vivian/Victoria Street and Willis/Manners Street junctions
Fuel consumption not increased by more than 5% by 2004	Fuel consumption

Of the 145 indicators initially identified for Wellington, only 16 appear in the completed RLTS. From discussions with process participants, the reduction in indicators appears to have been influenced largely by concerns about the practicalities and cost implications of adopting a wider range of indicators. In general, the indicators selected were chosen because they would be easier to monitor.

In comparison to Wellington, Canterbury developed RLTS targets towards the end of the strategy process. In the completed strategy, two specific environmental targets are identified relating to CO<sub>2</sub> and local air quality (Table 3.7).

**Table 3.7 Canterbury RLTS environmental targets.**

Target
Contain carbon dioxide emissions to no more than 10% above 2001 levels.
Maintain or improve local air quality with respect to motor vehicle emissions.

The Canterbury RLTS does not identify indicators for these targets, stating indicators will be developed in future years. At the time the strategy was released in March 2002, it was expected indicators would be in place by 2003.

The Waikato RLTS uses indicators only rather than targets. For environmental sustainability, the indicators relate primarily to air quality and noise (Table 3.8).

**Table 3.8 Waikato RLTS sustainability indicators.**

Indicator
Ambient air quality measured at key locations and compared to the Ministry for the Environment guidelines.
The number of infringement notices, abatement notices and enforcement orders served directly related to transport construction projects.
The compliance rate of vehicle exhaust emissions from an annual, randomly selected and significant sample of vehicles.
Noise levels, adjacent to strategic roads, as measured by RCAs at selected locations.
Measures undertaken by RCAs to control road traffic noise.

***Are monitoring measures adequate to meet environmental information needs?***

As required by legislation, all three regions produce annual monitoring reports on RLTS implementation. However, reports produced to date show data is not yet being consistently collected to measure strategy progress.

For most of the targets in the Canterbury RLTS, the 2003 monitoring report states either that work has not been done to collect data or that data is not yet available. In some cases, the report anticipates data will not be available until 2006. To date, no indicator has been developed in relation to the air quality target. For the CO<sub>2</sub> target, an indicator has been developed and data recorded for the 2003 year.

Canterbury has subsequently introduced some additional indicators, such as annual per capita diesel fuel usage, which over time will allow a broader, region-wide picture to be gained. At present, however, data inadequacies mean the council cannot adequately assess whether environmental objectives are being met.

In Wellington, the 2004 monitoring report provides data relating to the fuel consumption indicator. For air quality, the report notes, “[a]s only five months of data is currently available, no real trends have emerged and few conclusions will be reached for some years” (Greater Wellington - The Regional Council 2004, p.37).

The report considers three additional indicators. These are:

- noise adjacent to arterial routes,
- surface water quality,
- land use patterns.

Noise data had been collected for 2002 but no subsequent years. Collection is planned once every five years. Surface water quality is proposed as an indicator but no data have been collected to date. Some information is provided in the report on land use patterns.

The situation is similar in Waikato. For three of the five RLTS indicators, the 2004 monitoring report states no data has been collected. Some data has been collected in relation to the ambient air quality measure and the vehicle exhaust emission compliance measure.

In respect of air quality, monitoring undertaken in 2003 shows PM<sub>10</sub> levels (particles less than 10 microns in diameter) in excess of the national environmental standard for ambient air quality.<sup>24</sup> All four locations monitored recorded levels above the standard on a number of occasions.<sup>25</sup> No information is provided in the report on actions to address these breaches. The report states that resource requirements to meet the standard are still being assessed.

### 3.3.9 Public participation

#### ***Were opportunities provided for public participation in the RLTS process?***

For the most part, public participation in RLTS development was limited to making written submissions. More proactive public participation mechanisms such as community group meetings or advisory committees were not used. While some workshops were held, these tended to be targeted mainly at the transport sector rather than the wider community. This meant that workshops were dominated largely by government agencies with transport functions (e.g. Transfund, Transit), commercial transport representatives and road users.

Of the three councils, Waikato provided the greatest number of opportunities for the general public to make submissions. Three documents were released for submission, providing opportunities for public input on the:

- vision, objectives and regional transport issues,
- options paper,
- draft RLTS.<sup>26</sup>

Regional workshops were also held during the initial stages of strategy development and when the draft RLTS was released.<sup>27</sup> However, workshops were predominantly aimed at and attended by council and transport sector representatives rather than the general public.

In Canterbury and Wellington, the main opportunity for the general public to take part was provided by the submission and hearings process on the draft RLTS.<sup>28</sup> While some input was invited in earlier stages of strategy development, this tended to be restricted to groups identified as 'key stakeholders'. By and large, 'key stakeholders' were council and

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<sup>24</sup> Ambient (outdoor) air standards for fine particles (PM<sub>10</sub>), nitrogen dioxide, ozone, sulphur dioxide and carbon monoxide were introduced in 2004 in the first national environmental standard issued under the RMA 1991. By September 2005, councils must monitor and publicly report on air quality levels and any exceedances.

<sup>25</sup> Monitoring occurs at Peachgrove Road in Hamilton and at Tokoroa, Taupo and Te Kuiti.

<sup>26</sup> Copies of documents were sent out via council mailing lists and placed in public libraries. Notices were also placed in newspapers circulating in the region.

<sup>27</sup> Transport sector representatives were also invited to a number of meetings and workshops throughout the development process. These included a RLTC workshop and a full-day workshop of the technical working groups.

<sup>28</sup> Timeframes for public submissions were broadly comparable with statutory timeframes under the RMA. The RMA requires a period of not less than 40 working days for submissions on proposed policy statements and plans. Timeframes for submissions on the draft RLTS ranged from approximately six weeks (30 working days) in Wellington to around three months in Canterbury (60 working days). Waikato provided a period of two months (40 working days) for submissions on the draft RLTS. In earlier stages of the Waikato process, six weeks were provided for responses to the first *Transport Baseline Data and Regional Overview* report while around 10 weeks were provided for responses to the 'options' paper.

commercial transport representatives. Environmental and other public interest groups that could be expected to have an interest in transport were not widely represented.

The Canterbury process involved consultation with 'key stakeholders' at two main points. In the first consultation stage, stakeholders were invited to regional workshops to participate in the development of the RLTS vision, values and goals. Consultation was also carried out after completion of the second round of scenario modelling.<sup>29</sup> Feedback on the modelling results was sought from a small group of stakeholders. This round of consultation also included focus group research undertaken by a public relations firm. However, an opportunity for the involvement of other interested groups and individuals was not provided.

'Stakeholder' consultation in Wellington also involved a two stage process. In stage one, the council consulted key stakeholders to identify transport issues and needs. Council records indicate this process involved a community survey carried out by consultancy firm McDermott Miller. Some 'stakeholder' input was also invited in an RLTC workshop convened to discuss proposed RLTS indicators and targets.<sup>30</sup> A second round of consultation took place following the conclusion of the council's technical analysis. This process involved presentations to stakeholder groups, outlining the two main options identified through the technical work.<sup>31</sup> While some local community groups were involved at this stage, the wider public did not have an opportunity to take part.

***Did public participation processes help to facilitate involvement?***

Where the public was invited to make submissions, some efforts were made to facilitate input. These included:

- use of questionnaires providing a simple way to provide comment,
- provision of free-post envelopes to return submissions,
- opportunities to make submissions by email,
- special editions of council newsletters.

Both Canterbury and Waikato made use of questionnaires to facilitate feedback. In Waikato, a questionnaire-type feedback form was distributed with the 'options paper'. In Canterbury, a newsletter and feedback form were delivered to all households in the region at the time the draft RLTS was released. The feedback form contained a series of 'yes/no' questions designed to gauge support for key aspects of the RLTS. Wellington also produced a specific newsletter when the draft RLTS was released. This was a special

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<sup>29</sup> Consultation at this stage was undertaken to "see if the planners had got a direction and outline content that reflected the aspirations of the community" before moving to the next step of writing the strategy (Ball, R., Environment Canterbury, pers. comm.).

<sup>30</sup> The RLTC held a workshop of invited 'key stakeholders' to discuss the draft RLTS indicators. Feedback from the workshop was discussed at a subsequent RLTC workshop before a set of indicators and targets were adopted. No further opportunity was provided for public comment on the objectives and targets until the draft RLTS was released for public submission.

<sup>31</sup> Presentations were made to several councils and government agencies, including Transit and the Ministry of Transport. Other groups that received presentations included the Automobile Association, Cycle Aware, Institute of Professional Engineers (Wellington Branch), Paremata Residents Association, Road Transport Forum, Transport 2000, Tranz Rail, Wellington Central Rotary Club and the Wellington Chamber of Commerce.

edition of the council's publication *Transport Futures* (Wellington Regional Council 1999e) which summarised key aspects of the strategy.

In some instances, information about the process had limited distribution. For example, in Canterbury the RLTS vision, values and goals were initially published in a poster form. Feedback was invited by mail or telephone. However, distribution of the poster was not widespread and there is no record of any submissions being received in response (Patrick Quinn, Environment Canterbury, pers. comm.). A second publication produced after stage two of the modelling process also had limited distribution.

In Wellington, information relating to the modelling process raised issues in terms of clarity and completeness. The RLTS provided a brief summary of the modelling process and directed readers to the modelling reports for further information. However, the reports are of a technical nature and data are not always presented in a form that makes them accessible to a wide audience.

***Were public interest groups with particular environmental and/or social concerns identified and involved?***

In general, environmental and other public interest groups did not participate in RLTS development in large numbers.

In Canterbury, some public interest group representatives were involved in the vision and goals workshops. At this stage of the process, however, no participation was invited from walking and cycling interests.<sup>32</sup> In Wellington, only a small number of environment groups participated in the public submission process. One former Wellington RLTC member suggested a more proactive approach was needed to foster participation by environmental groups in transport planning.

In Waikato, only one representative of an environment group took part in the first round of regional workshops. Participation in the second round of workshops was also limited. Few environment groups made written submissions during the RLTS process. The first discussion paper attracted submissions from just one environment group. The 'options' paper attracted submissions from groups with interests in health and mobility (3), the environment (2) and cycling (2). In comparison, around 17 submissions were received from industry and transport sector groups. Similarly, of the 39 submissions received on the draft RLTS, just two (5%) were from environment groups. Eight submissions (21%) were from industry groups.

Representation of public interest groups was also an issue in respect of RLTC membership. In Wellington, the 24 member RLTC included just one person representing public transport, walking and cycling interests. In Canterbury, two people representing these sectors were appointed to the 27 member RLTC. Representation was also limited in the Waikato process, with one RLTC member appointed to represent cycling interests.<sup>33</sup>

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<sup>32</sup> This sector was invited to participate in subsequent stages.

<sup>33</sup> The process used to appoint representatives of public transport, walking and cycling interests tended to be informal, with approaches being made by the council to a limited number of groups.

***Were the views expressed by the public taken into account in decision-making processes?***

In the early stages of RLTS development, consultation processes provided the opportunity for some public input into the strategy's vision and objectives. However, there were few opportunities for the public to contribute to subsequent stages of strategy development. At the point when a draft RLTS was released for submission, available information suggested public feedback had little effect on the final shape of the strategy. No substantive changes were made to the RLTS after the submission and hearings process in any region.

In Canterbury, changes resulting from submissions were mostly of a minor nature. Requests for more fundamental or far reaching changes were generally declined. Similarly, interviews with members of the Wellington RLTC hearings sub-committee indicate minor changes only were made to the strategy as a result of public submissions. The report of the hearings sub-committee supports this view, suggesting few changes were agreed to following the public hearings process.

In Waikato, public feedback on the options paper appears to have contributed to the shape of the RLTS to some degree. Preferences expressed in responses to the options paper questionnaire were referred to in subsequent reports. However, as in Canterbury and Wellington, no substantive changes were made as a result of public submissions on the draft RLTS. Major changes at this stage of the process would not necessarily be expected if opportunities for public participation had been provided throughout the process. For the most part, however, this was main opportunity for public comment on the content and direction of the RLTS.

### **3.4 Summary**

Analysis of RLTS preparation in the three case study regions shows similarities between the regions in the approach to strategy development. It also shows some similarities between the steps in RLTS development and steps in a typical SEA process. Common steps that can be identified are the development of environment objectives, the use of a process to consider alternatives, and opportunities for public participation.

However, the analysis also highlights areas where SEA could enhance the RLTS process, strengthening the environmental information base and the quality of decision making. In general, the approach to environmental assessment in the case study regions was limited. Analysis of RLTS development against the SEA checklist shows:

- Environmental objectives tended to be of a general nature, lacking sufficient definition to guide strategy development.
- Scoping of environmental issues and collection of baseline data focused on a narrow range of considerations.
- Processes to identify and evaluate alternatives were not supported by comprehensive environmental analysis.

- Gaps in information and the limited environmental criteria used in assessment meant decision making was not underpinned by a strong environmental information base.
- Opportunities for public participation were of variable quality and inclusiveness. Industry, commercial interests and road users tended to be better represented than environmental and other public interest groups.
- Current monitoring measures are generally insufficient to assess whether strategies are achieving intended environmental outcomes.

These results strongly suggest SEA has the potential to assist in improving environmental assessment in future RLTS processes.



## 4. SEA Application to RLTS development

### 4.1 Overview

Based on the results of the analysis presented in Chapter 3, this chapter examines how SEA can be used to assist future RLTS development. It begins by outlining key methodological principles to guide SEA application. It then describes some of the practical SEA methods and techniques available for use in RLTS preparation.

### 4.2 Methodological principles for SEA application

There is no single 'one size fits all' approach to SEA application. Instead, the SEA process should be customised to the context and characteristics of the given situation. This can be identified as *methodological principle number one*. The phrase 'fit-for-purpose' is sometimes used when referring to this principle (Sadler 1998b). In terms of RLTS preparation, it may be appropriate to develop a 'made in New Zealand' approach drawing on methods best suited to domestic requirements and recognising regional variations.

A range of SEA methods and tools are available for use in RLTS preparation. Table 4.1 lists examples of SEA methods derived from EIA and policy appraisal. These methods are discussed in more detail later in this chapter.

**Table 4.1 Examples of methods used in SEA.**

EIA derived methods	Policy appraisal
<ul style="list-style-type: none"> <li>• Checklists</li> <li>• Matrices</li> <li>• Impact networks</li> <li>• Simulation modelling</li> <li>• Comparative risk assessment</li> <li>• Health impact assessment</li> </ul>	<ul style="list-style-type: none"> <li>• Environmental scan</li> <li>• Scenario development</li> <li>• Options appraisal</li> <li>• Multi criteria analysis</li> <li>• Stakeholder analysis</li> <li>• Constraints and vulnerability mapping</li> </ul>

Generally, the simplest tool appropriate for the task should be used (Sadler 2001). At the scoping stage, checklists and matrices are commonly used to identify impacts. In later stages, it is likely more advanced methods will be needed to provide information on environmental impacts. However, the 'simple as possible rule' still applies. This can be identified as *methodological principle number two*.

With certain adaptations, EIA-derived methods should be applicable to RLTS development. These methods will be particularly useful where specific actions (such as new roads) with evident impacts are being considered. Where the environmental effects of actions are indirect then policy appraisal tools may be more appropriate (Sadler & Verheem 1996). However, the decision on which method to use should be made on a case by case basis, taking account of available data and scale considerations. This is *methodological principle number three*.

To enable SEA to be carried out systematically, certain supporting elements need to be in place. This is *methodological principle number four*. Key supporting elements for SEA include:

- **Baseline or background information** to identify the potential environmental impacts of a proposed strategic action.
- **Headline indicators** to assess whether environmental objectives are being met.
- **Policy frameworks** to facilitate consideration of alternatives in relation to environmental and sustainability directions set at a national level (Sadler 2004).

Box 4.1 provides a summary of these principles.

**Box 4.1 Summary of methodological principles for SEA.**

Principle 1	The application of SEA should be customised to context.
Principle 2	The simplest SEA methods appropriate for the task should be used.
Principle 3	The decision on the methods to use should be made on a case by case basis, taking account of data and scale considerations.
Principle 4	Supporting elements need to be in place to enable SEA to be carried out systematically.

### 4.3 SEA tools for RLTS preparation

Table 4.2 lists a range of methods that can be used at each stage of the SEA process. In general, the earlier stages of SEA are associated with what are termed ‘rapid assessment tools’. A rapid SEA approach can be used to:

- scan and characterise the environment (e.g. baseline study),
- scope key environmental issues and formulate alternatives,
- evaluate potential impacts of alternatives against objectives.

In later stages of strategy development, more detailed studies will usually be needed. Geographic information systems (GIS) and other tools can be used to assess the environmental impacts of alternatives and the preferred or best practicable environmental option.

The potential use of the SEA methods outlined in Table 4.2 is discussed below.

**Table 4.2 SEA methods for RLTS preparation.**

Step	Examples of methods
Objective setting	<ul style="list-style-type: none"> <li>• Policy mapping</li> <li>• Focus groups</li> <li>• Goals achievement matrix</li> </ul>
Scoping	<ul style="list-style-type: none"> <li>• Impact identification</li> <li>• Public consultation</li> <li>• Expert judgement</li> </ul>
Baseline study	<ul style="list-style-type: none"> <li>• State of the environment reports and trend data</li> <li>• Land and ecological characterisation</li> <li>• 'Points of reference' from previous studies</li> </ul>
Developing alternatives	<ul style="list-style-type: none"> <li>• Community dialogue</li> <li>• Sustainability screening</li> <li>• Preliminary scan of issues</li> </ul>
Impact analysis	<ul style="list-style-type: none"> <li>• Matrices</li> <li>• Networks</li> <li>• Predictive and simulation models</li> <li>• Geographic information systems</li> <li>• Multi-criteria analysis</li> </ul>
Quality review	<ul style="list-style-type: none"> <li>• Quick scan procedure</li> <li>• Evaluation criteria</li> <li>• Review packages</li> </ul>
Decision making	<ul style="list-style-type: none"> <li>• Trade-off matrices</li> <li>• Policy impact matrix</li> <li>• Threshold test</li> </ul>
Monitoring	<ul style="list-style-type: none"> <li>• Surveillance of plan implementation</li> <li>• Effects monitoring</li> <li>• Effectiveness and performance review</li> </ul>
Public participation	<ul style="list-style-type: none"> <li>• Open houses</li> <li>• Public hearings</li> <li>• Planning round tables</li> </ul>

*Source:* adapted and updated from Sadler & Verheem (1996)

### 4.3.1 Developing environmental objectives

The statutory requirements of the Land Transport Act provide the key starting point for developing RLTS environmental objectives. As discussed, the Act requires every RLTS to:

- contribute to achieving an integrated, safe, responsive and sustainable land transport system,
- take into account how it ensures environmental sustainability.

A major challenge for RLTSs will be to translate the Act's sustainability objectives into a form against which policy and planning alternatives can be evaluated. To inform this process, 'policy mapping' can be used to identify relevant sustainability goals and targets in government strategies and programmes (Sadler 2003).

The LTA requires RLTSs to consider the provisions of the National Energy Efficiency and Conservation Strategy (NEECS). While not required by legislation, a range of other central government strategies with relevance to transport could usefully be considered. In addition to the NZTS, these include:

- New Zealand Biodiversity Strategy,
- New Zealand Climate Change Programme,

- New Zealand Disability Strategy,
- New Zealand Health Strategy,
- New Zealand Urban Design Protocol,
- Vehicle Fleet Emission Control Strategy.

Environmental sustainability objectives informed by policy mapping can be validated or elaborated through public consultation processes.

In subsequent stages of strategy development, objectives can be organised into a goals-achievement matrix (GAM). The matrix provides a framework for evaluating alternatives in terms of their impact on defined aims or outcomes. It has particular value in bringing transparency to an objectives-led approach. Box 4.2 summarises the GAM process.

**Box 4.2 Goals achievement matrix (GAM).**

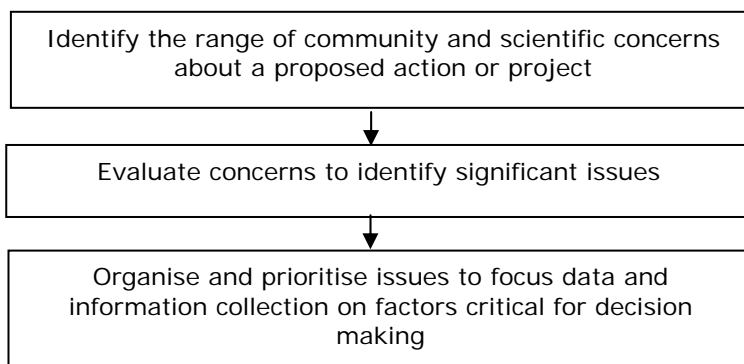
The GAM is an established method for assessing the impact of plans and strategies. It has three key components:

1. identifying community goals,
2. quantifying impacts,
3. application of value weights for each objective, providing a means of scoring the goals achievement of each alternative (derived from multiplying weights by impacts).

Full application of the GAM can be data demanding. The mathematical calculations and some of the weighting assumptions are also open to criticism. For present purposes, the main value of the GAM is its emphasis on organising an assessment to focus on objectives, classifying impacts and issues according to the social groups affected by them and recording the impacts in a way that facilitates comparison of alternatives.

### 4.3.2 Scoping

As a comprehensive process, scoping typically includes the following steps:



A simple but systematic three-step methodology can be used to scope the key environmental issues and impacts that need to be addressed in an RLTS (Sadler & McCabe 2002, pp.229-230):

- **Step 1:** Compile a 'long list' of concerns from available data and information provided by the community. No attempt should be made at this stage to exclude or pre-judge concerns.

- **Step 2:** Derive a 'short list' of key issues and problem areas based on their potential significance and likely importance for decision making.
- **Step 3:** Classify and order the key issues into "impact categories".

At the scoping stage, relatively simple methodologies and tools can be used to identify potential impacts (as compared to more complex, data-demanding methods used in impact prediction). Experience indicates these simple methods assist in providing a systematic approach to impact identification. The most common, formal methods used for impact identification are:

- checklists,
- matrices,
- networks,
- overlays.

Box 4.3 summarises these methods.

**Box 4.3 Impact identification methods for scoping.**

**Checklists** annotate the environmental features or factors that need to be addressed when identifying the impacts of policies and plans. They can vary in complexity and purpose, from a simple checklist to a structured methodology or system that also assigns significance by scaling and weighting impacts. Both simple and descriptive checklists can be adapted for use in the transport sector. Generally, checklists are not as effective in identifying higher order impacts or the inter-relationships between impacts. When used, consideration therefore needs to be given to whether impacts other than those listed may be important.

**Matrices** are grid-like tables used to identify the interaction between proposed activities, which are displayed along one axis, and environmental characteristics, which are displayed along the other axis. Using the matrix, environment-activity interactions can be noted in the appropriate cells or intersecting points in the grid. Entries are made in the cells to highlight impact severity or other features related to the nature of the impact. For instance:

- ticks or symbols can identify impact type (such as direct, indirect or cumulative),
- numbers or a range of dot sizes can indicate scale.

Descriptive comments can also be made.

**Networks** illustrate the cause-effect relationship between proposed actions and environmental characteristics. They are particularly useful in identifying and depicting secondary impacts (indirect or cumulative impacts). Simplified networks, used in conjunction with other methods, help to ensure that important second-order impacts are not omitted from investigation. More detailed networks can become overly complicated, time-consuming and difficult to produce unless a computer programme is used for the task. However, they can be a useful aid to formalising "impact hypotheses".

**Overlays** can be used to map impacts spatially and display them pictorially. The original overlay technique, popularised by McHarg (1971), provides an environmental suitability analysis in which data on topographic features, ecological values and resource constraints are mapped onto individual transparencies and then aggregated into a composite representation of potential impacts.

**Box 4.3 (continued)**

This approach is useful for comparing site and planning alternatives, for routing linear developments to avoid environmentally sensitive areas and for landscape and habitat zoning at the regional level. Disadvantages of this approach relate to the lack of precision in differentiating the likelihood and magnitude of impacts and relating them to proposed actions. The overlay process can also become cumbersome in its original form. Geographic information systems are the modern version of the overlay method but are much more data demanding.

*Source:* adapted from Sadler & McCabe 2002.

**4.3.3 Establishing an environmental baseline**

Analysis of RLTS preparation highlights the need for a more structured approach to collecting baseline data on environmental conditions and trends. Assembling baseline information can be time-consuming and expensive, particularly if field monitoring is necessary to acquire new data. It is therefore critical that work focuses on the key issues identified in the scoping process.

In the first instance, a review of existing information should be undertaken. For example, the RMA requires regional councils to monitor the state of the environment in their region. This work may provide an initial approximation of baseline conditions. It can be supplemented as necessary with studies that describe or characterise the regional environment. Particular attention should be given to:

- environmental features distinctive in the region (e.g. flooding, drought, seismic activity, land instability),
- valued ecosystem components such as sensitive areas or biodiversity features,
- 'black spots' with high pollution concentrations or incidences of traffic accidents.

Based on an appraisal of data availability and quality, further baseline studies may need to be carried out. These can be guided by "points of reference" drawn from previous studies and knowledge of the typical impacts of transport plans. Examples include air and water quality conditions in heavy traffic areas, noise levels in inner cities and neighbourhood severance. Table 4.3 provides an example of a baseline data summary table.

**Table 4.3 Example of a baseline data summary table.**

Topic/indicator	Quantified data	Comparators and targets	Trends
<b>Air</b>			
<b>Biodiversity</b>			
<b>Human health</b>			
<b>Landscape</b>			
<b>Social inclusiveness</b>			
<b>Water</b>			

Difficulties may be encountered in collecting appropriate and sufficient information on area-wide, cumulative impacts associated with the RLTS. In this situation, risk-based

assessment may help to structure and compare the relative importance of different environmental impacts in relation to the likelihood of occurrence.

Given the timeframe for RLTS preparation, it is likely that current baseline conditions will still exist when the strategy is implemented. However, for some proposals with long lead times, assessment may need to be carried out against a projected future state of the environment. This is typically done through trend extrapolation, in some cases using alternative scenarios or 'best' or 'worst' case situations. The following information will be required for this purpose:

- current environmental conditions,
- past and future trends,
- effects of proposals already being implemented,
- effects of other foreseeable proposals.

#### **4.3.4 Consideration of alternatives**

In identifying alternatives in transport policy and planning processes, a three-phase approach can be followed as part of SEA:

- Phase 1: Adopt a tiered approach that as far as possible seeks to secure environmental gains through demand management and traffic management.
- Phase 2: Test the main alternatives against an environmental sustainability frame of reference.
- Phase 3: Analyse the impact of the main alternatives to identify the best practicable environmental option (BPEO).

Ideally, a tiered approach should consider the main types of transport alternative as outlined in Box 4.4. In this framework, priority is given to considering alternatives to manage or reduce demand. Community input can be helpful in the initial generation and analysis of demand alternatives. This can be facilitated through, for example, a policy round table comprising community representatives.

#### **Box 4.4 A tiered approach to consideration of transport alternatives.**

- 1. Demand alternatives** (e.g. pricing or charging to reduce congestion)
- 2. Technological alternatives** (e.g. use of energy-efficient vehicles)
- 3. Supply alternatives** (e.g. new or expanded infrastructure)
- 4. Activity alternatives** (e.g. investing in public transport facilities rather than increasing road capacity)
- 5. Location alternatives** (e.g. network reconfiguration or bypass routing)
- 6. Operational alternatives** (e.g. timing and speed of traffic flows)

*Source:* World Bank 1996

It is possible that some alternatives may be foreclosed by earlier stages of decision making or fall within the responsibility of central government. These alternatives may have to be either acknowledged as 'givens' or in certain cases revisited to see if new legal

and policy frameworks offer opportunities for reconsideration. A preliminary scan of the issues can help to identify the way forward.

When identifying and considering feasible RLTS alternatives, the following questions can be used to gauge their compatibility with environmental sustainability goals:

- How or to what extent will the proposed alternative, on its own, or in combination with others:
  - Move toward or away from prevailing New Zealand guidance on environmental sustainability?
  - Improve resource efficiency?
  - Reduce the use of non-renewable resources?
  - Lead to a shift from non-renewable to renewable resources?
  - Avoid potentially adverse impacts on communities and the environment?

This approach should point towards a 'best practicable environmental option' (BPEO). In the context of RLTS development, the BPEO will be the alternative that delivers the best environmental gain consistent with achieving other transport objectives. This determination usually does not take place until after the impact analysis phase (see Section 4.3.5 below).

The development of viable, demand management alternatives will require a closer integration of transport and land use planning processes. In particular, linking land use planning to the RLTS process will be essential if a full range of demand management alternatives is to be identified and assessed. This means that transport planning must move beyond its tradition role of responding to traffic demand imposed by land use planning decisions. SEA can provide a means of linking land use and transport planning, enabling land use patterns to be considered in combination with alternative transport scenarios.

#### **4.3.5 Environmental assessment**

Analysis suggests environmental assessment in RLTS development has been a relatively limited process to date. Current approaches can be strengthened through the use of a more formalised methodology for impact analysis as follows:

- Phase 1: Identify the impacts to be investigated in detail.
- Phase 2: Predict their likely magnitude and other characteristics.
- Phase 3: Establish mitigation measures.
- Phase 4: Evaluate the significance of residual impacts.

##### **4.3.5.1 Impact identification**

Impact identification builds on and completes the process begun in scoping. It is intended to account fully for the significant environmental impacts, including indirect and cumulative effects. Use of relatively simple and straightforward methods, such as those outlined in Box 4.3, will be sufficient for most purposes.



For those who are not experienced in impact assessment work, the main advantages and disadvantages of methods commonly used are summarised in Table 4.4.

**Table 4.4 Advantages and disadvantages of impact identification methods.**

Method	Advantages	Disadvantages
<b>Checklists</b>	<ul style="list-style-type: none"> <li>• Easy to understand and use</li> <li>• Good for site selection and priority setting</li> </ul>	<ul style="list-style-type: none"> <li>• Do not distinguish between direct and indirect impacts</li> <li>• Do not link action and impact</li> <li>• Process of incorporating values can be controversial</li> </ul>
<b>Matrices</b>	<ul style="list-style-type: none"> <li>• Link action to impact</li> <li>• Good method for displaying results</li> </ul>	<ul style="list-style-type: none"> <li>• Difficult to distinguish direct and indirect impacts</li> <li>• Potential for double-counting of impacts</li> </ul>
<b>Networks</b>	<ul style="list-style-type: none"> <li>• Link action to impact</li> <li>• Useful in simplified form for checking for second order impacts</li> <li>• Handle direct and indirect impacts</li> </ul>	<ul style="list-style-type: none"> <li>• Can become complex if used beyond simplified version</li> </ul>
<b>Overlays</b>	<ul style="list-style-type: none"> <li>• Easy to understand</li> <li>• Focus and display spatial impacts</li> <li>• Good siting tool</li> </ul>	<ul style="list-style-type: none"> <li>• Can be cumbersome</li> <li>• Poorly suited to address impact duration or probability</li> </ul>
<b>GIS</b>	<ul style="list-style-type: none"> <li>• Excellent for impact identification and spatial analysis</li> <li>• Good for experimenting</li> </ul>	<ul style="list-style-type: none"> <li>• Heavy reliance on knowledge and data</li> <li>• Often complex and expensive</li> </ul>

*Source:* adapted from Sadler & McCabe 2002, p.261.

#### 4.3.5.2 Impact prediction

Impact prediction focuses on forecasting the characteristics of the potential environmental impacts. The parameters that need to be considered are summarised in Box 4.5.

**Box 4.5 Key parameters of environmental impact analysis.**

<ul style="list-style-type: none"> <li>• <b>Nature</b> of the impact (positive, negative, direct, indirect, cumulative)</li> <li>• <b>Magnitude</b> of the impact (severe, moderate, low)</li> <li>• <b>Spatial extent/location</b> of the impact (local, regional, global)</li> <li>• <b>Timing</b> of the impact (during construction, operation, decommissioning, immediate, delayed, rate of change)</li> <li>• <b>Duration of the impact</b> (short term, long term, intermittent, continuous)</li> <li>• <b>Reversibility/irreversibility</b> of the impact</li> <li>• <b>Likelihood</b> of the impact occurring (probability, uncertainty or confidence in the prediction)</li> <li>• <b>Significance</b> of the impact (important, unimportant)</li> </ul>
<p><i>Source:</i> Sadler &amp; McCabe 2002, pp.264-265</p>

The tools used for impact prediction include both simple methods used in impact identification (e.g. matrices) and more advanced computer modelling techniques (e.g. GIS). The choice of approach should be appropriate to the cause-effect relationship being

studied. Use of quantitative prediction methods should have particular regard to the level of uncertainty associated with potentially significant impacts.

For each alternative considered, the major impacts should be assessed against the environmental objectives and with reference to baseline conditions. Typically, the next step involves comparing alternatives. Some examples of methods used for this purpose are listed in Table 4.5. These include traditional methods such as cost benefit analysis (CBA) and its various derivatives, which require impacts to be valued in monetary terms.

The range of methods also includes multi-criteria analysis (MCA), which combines weights and scores to rank options. MCA has greater scope than CBA in analysing environmental impacts but does not necessarily produce a single, unambiguous answer. Regardless of the approach or method used, results of the analysis should be communicated clearly with data limitations documented, assumptions stated and uncertainties or confidence limits specified.

**Table 4.5 Methods for comparing alternatives.**

Method	Description
Cost effectiveness analysis	Used to select the option which achieves a target or goal at least cost (environmental or economic). This is a useful technique in cases where actions are clearly constrained by existing environmental targets or objectives, for example, ambient air and water quality standards or emission limits.
Cost-benefit analysis (CBA)	Used to express as many impacts as possible in a unified value; the cost benefit ratio is a basis for choice between the options reviewed.
Multi-criteria analysis (MCA)	Used as an advanced form of CBA in which separate scores on a number of key evaluation criteria are given, rather than using one, unified value to express the significance of all impacts (as is the case in CBA). The combinations of weights and criteria scores provide a ranking of options. MCA does not necessarily lead to one, unambiguous solution; it generally leaves some freedom to decision makers. The 'goals achievement matrix' is a specific form of MCA, which identifies how an action may contribute to a set of defined environmental objectives.
Aggregation methods	Used to translate groups of indicators into one, composite indicator. The aim is to make the environmental information more manageable. In this process, results are often weighed against each other and 'trade-off' choices are made. In principle, these are political decisions and therefore care should be taken in using aggregation methods for SEA. However, some aggregation is usually needed and possible without generating controversy. Some methods are: <ul style="list-style-type: none"> <li>• Index methods - aggregation by valuation and weighed summation.</li> <li>• Monetary methods - all impacts are translated into one unit. As yet, they are insufficiently developed for use in SEA.</li> </ul> Source methods - aggregation on an impact basis, for example, energy sources according to their contribution to CO <sub>2</sub> or air pollution emissions.

Source: adapted from Sadler & Verheem 1996, pp.148-149

#### 4.3.5.3 Mitigation

As part of the impact analysis process, mitigation measures are usually described for each main alternative. This approach is undertaken to gain a systematic understanding of the potential significance of proposed actions for environmental sustainability and to facilitate problem solving.

At all phases of SEA, the approach to mitigation should follow the mitigation hierarchy as follows:

1. Avoid adverse impacts as far as possible by using preventive measures.
2. Minimise or reduce adverse impacts to as low as practicable levels.
3. Remedy or compensate for adverse residual impacts, which are unavoidable and cannot be reduced further.

In transport planning, mitigation is generally carried out by:

- **Structural measures** such as design or location changes to plans or network engineering to modify traffic flow conditions.
- **Non-structural measures** such as economic incentives; legal, institutional and policy instruments; or provision of community services.

#### **Box 4.6 Step-by-step approach to mitigation in transport planning.**

##### **Step One: Impact avoidance**

This step is most effective when applied at an early stage of strategy formulation. It can be achieved by:

- Not undertaking certain actions or projects that could result in severe or irreversible adverse impacts.
- Avoiding areas that are environmentally sensitive.
- Investing in non or low-pollution public transport technology (e.g. a hydrogen-fuelled bus fleet).

##### **Step Two: Impact minimisation**

This step is usually taken during impact identification and prediction to limit or reduce the degree, extent, magnitude, or duration of adverse impacts. It can be achieved by:

- Scaling down or redesigning elements of the strategy or plan.
- Securing energy efficiencies or reducing emissions.
- Reconfiguring networks or relocating proposed new routes.
- Taking supplementary measures to manage or reduce impacts.

##### **Step Three: Impact compensation**

This step is usually applied to remedy unavoidable residual impacts. It can be achieved by:

- Rehabilitation of affected sites or areas (e.g. reseeded and restocking).
- Like-for-like replacement of the same resource values at another location, e.g. wetland improvement and management to provide an equivalent area to that lost through right of ways.
- Comparable offset for loss and damage.

Caution is advised in considering impact compensation. In many situations, compensation will be inappropriate or inadequate to fully account for adverse environmental impacts. A precautionary approach is therefore needed.

*Source:* adapted from Sadler & McCabe 2002, pp.308-309

#### **4.3.5.4 Evaluating significance**

Impact analysis concludes with a determination of the significance of the likely effects that a strategy and its components will have on the environment. The objective of evaluation, as compared to prediction, is to determine whether the impact of one alternative is more serious or important than another. Usually this involves making a subjective or value judgement, based on the magnitude and other characteristics of the impacts. Generally, such judgements can be made by ranking or rating impacts to reflect their relative differences. Where this type of approach is followed, the assumptions made and their implications need to be clearly explained.

As far as possible, evaluation should be done using pre-agreed criteria. These usually fall into three main categories:

- **Legal or regulatory standards** established for air and water quality and noise that provide an objective, technical means of determining the significance of residual impacts.
- **Environmental management objectives** that are qualitative, broadly drawn and require interpretation in relation to the impact of transport plan elements and implementation.
- **Sustainability rules or guidelines** that provide a 'proxy' check on whether a strategy or plan is moving toward or away from key national policy commitments.

In practice, there can be considerable difficulties in applying the last two sets of criteria.

As a general rule, impacts are likely to be significant if they:

- are extensive over space or time,
- are intensive in concentration or in relation to assimilative capacity,
- exceed or approximate to environmental standards or thresholds,
- do not comply with environmental policies, land use plans or sustainability strategies,
- affect ecologically sensitive areas and heritage resources,
- affect community lifestyle, traditional land uses and values.

Box 4.7 outlines general guidelines and principles for evaluating significance.

**Box 4.7 Aids and principles for evaluating significance.**

**Key reference points** for evaluating significance include:

- environmental standards, guidelines and objectives,
- level of public concern,
- scientific and professional evidence for:
  - loss/disruption of valued resource stocks and ecological functions,
  - negative impacts on social values, quality of life and livelihood,
  - foreclosure of land and resource use opportunities.

**A test of significance** can be applied by asking three questions:

- are there residual environmental impacts?
- if yes, are these likely to be significant or not?
- if yes, are these significant effects likely to occur?

**Criteria to evaluate adverse impacts** on natural resources, ecological functions or areas designated for conservation purposes include:

- reduction in species diversity,
- depletion or fragmentation in plant and animal habitat,
- loss of threatened, rare or endangered species,
- impairment of ecological integrity, resilience or health e.g.:
  - disruption of food chains,
  - decline in species population,
  - alterations in predator-prey relationships.

**Criteria to evaluate the significance** of adverse social impacts that result from biophysical changes include:

- threats to human health and safety (e.g. from emissions, noise or traffic concentration),
- disruption in access to land, resources or community interaction,
- deterioration or loss of areas that have cultural, recreational or aesthetic value.

*Source: Sadler & McCabe 2002, pp.277-278*

#### **4.3.5.5 Assessment of cumulative effects**

Cumulative effects are an important and problematical aspect for assessment. Most plans will include proposed measures that have a range of environmental effects (e.g. on air and water quality, flora and fauna, noise levels, climate and hydrological systems) and direct and indirect socioeconomic consequences (e.g. public health and safety issues).

These effects are cumulative to the extent they:

- combine with each other to make the sum greater than the parts,
- add to the regional environmental burden.

Cumulative effects associated with transport commonly include:

- climate change,
- air quality deterioration,
- changes in land use,
- fragmentation of habitats,

- loss of biodiversity,
- changes in landscape character,
- loss of tranquillity,
- health problems,
- community severance,
- social inequities, e.g. in access to services (Department of Transport (UK) 2004, p.35).

More than any other factor, assessment of cumulative effects highlights the issue of how to address uncertainties associated with impact analysis. A simple approach is to identify the uncertainties encountered and describe what they mean for decision making. There are also formal, risk-based methods that can be used. These include a qualitative assessment of the relative level of threat to the environment when the probability or frequency of an effect cannot be calculated. In this context, a 'best versus worst case' characterisation of the potential cumulative effects can help focus on the implications for environmental sustainability.

#### **4.3.6 Quality review**

While some types of informal quality review were identified in the case study regions, further checks and balances could be built into the RLTS process to ensure decision making has a sound information base. Given the legislative requirement for RLTSs to be independently audited (LTA, section 175(2)(p)), a systematic and transparent quality review can provide a first line of assurance to decision makers that information used in the process is reliable and robust.

At a minimum, a quality review process should contain specific measures to check that the environmental information provided for decision making is sufficient. It should also identify any deficiencies or shortfalls that need to be corrected or additional work to be undertaken prior to final approval of the RLTS. An initial check may be gained by reference to a number of simple questions related to process completion:

- Has scoping identified key issues, baseline data requirements and alternatives?
- Have the main alternatives been analysed and compared in terms of their impacts?
- Have the views and concerns of affected and interested parties been taken into account?
- Has environmental information been taken into account at key stages in RLTS preparation?
- Is information on environmental impacts documented in the draft strategy or in a separate report?

Review processes can be either formal or informal. A formal, in-depth review is recommended for strategies that include controversial actions. In some cases, quality review may require technical backup through, for example, transport modelling.

Where an informal review process is used, the following steps will be helpful to screen the quality of information:

1. **Focus on the environmental objectives or terms of reference as a basis for reviewing the quality of information:** a simple test is to ask whether the objectives are clearly identified and if they provide a sufficient basis for scoping.
2. **Compare the scope and depth of information on environmental impacts to that available in other RLTS processes:** this can provide a 'yardstick' against which to assess the quality of information, although a further test will be necessary to determine whether the information is sufficient for decision making.
3. **Apply three quick scans to review the quality of information:**
  - Were appropriate studies undertaken to address the environmental issues scoped?
  - Was the environmental assessment process implemented in a clear and transparent manner?
  - Were the findings from the environmental assessment documented or reflected in RLTS formulation?

If the answers at each and all stages are positive, it is likely that the quality of information will be sufficient for decision making. However, it should be noted that these tests are intended to be indicative not definitive.

For situations where a formal SEA report is prepared, guidance on good practice is summarised in Box 4.8. This guidance is drawn from international experience with SEA quality review.

**Box 4.8 Steps to achieve good practice in SEA quality reviews.**

- Set the scale/depth of the review.
- Select reviewer(s) and establish an agreed methodology.
- Use input from public involvement.
- Identify review criteria and aspects to be considered.
- Determine how to remedy any deficiencies.
- Document the findings.

#### **4.3.7 Decision making**

Policy and planning processes consist of a series of implicit or explicit decisions on whether proposed actions are acceptable and justifiable. The process is iterative and conclusions reached at each stage narrow down the choices to be made at the next.

In making decisions, planners, technical staff and others involved in the process consider environmental as well as economic and social factors. Box 4.9 provides a summary of information considered important for decision making. It lists the key aspects that decision makers need to have regard to, particularly when giving final approval to an RLTS.

**Box 4.9 Information considered important for decision makers.**

**Background**

- Background information, including environmental baseline data and trends

**Policy context**

- Basic transport demands and problems being addressed (e.g. congestion, lack of mobility, infrastructure quality or shortage)
- Relationship of issues and problems to environmental policies and plans

**Alternatives**

- Type and range of alternatives considered in strategy formulation
- Economic, environmental and social aspects of major alternatives

**Public involvement**

- Stakeholder and public groups consulted
- Main concerns of interested and affected parties
- Areas of agreement and disagreement

**Impact analysis**

- Adverse and positive environmental effects
- Distribution of gains and losses

**Recommendations**

- Extent to which the draft strategy meets legislative and sustainability objectives

The key obligations with respect to the role of SEA in RLTS decision making are to:

- give due weight and attention to environmental considerations in strategy preparation,
- ensure environmental considerations are incorporated into the selection of alternatives in a fair (unbiased), consistent and balanced manner,
- follow an open and transparent process of planning and decision making in which the reasons for choice are evident and documented,
- include a justification as to why the final strategy is considered environmentally sustainable.

For ease of consideration of environmental impacts, a systematic format should be used to present information to decision makers. A summary of the main characteristics of impacts and their significance is particularly important. Table 4.6 provides an example of an impact characteristic summary table.



**Table 4.6 Impact characteristic summary table.**

Impact Characteristic	Impact Type		
	Air/water/soil	Flora/fauna	Health/social
Nature			
Magnitude			
Extent/location			
Timing			
Duration			
Reversibility			
Likelihood			
Significance			
<i>Source: Sadler &amp; McCabe 2002, p.336</i>			

### 4.3.8 Monitoring

Monitoring the environmental impacts of strategy implementation has a number of different dimensions. These can be seen as part of a broader process of SEA follow up and evaluation. Table 4.7 lists key monitoring activities and their purpose.

**Table 4.7 SEA follow-up activities.**

Activity	Purpose	Characteristics
Surveillance or tracking	To ensure strategy implementation is consistent with environmental objectives	Periodic check on progress; basic indication of SEA performance
Effects monitoring	To ensure environmental impacts of strategy implementation are within acceptable limits	Repetitive measure of environmental change against baseline and control data; key indication of SEA performance (i.e., impacts as predicted)
Impact management	To address any problems identified by monitoring or surveillance	Corrective action(s) taken when impacts are larger than expected or mitigation measures are unsuccessful
Effectiveness and performance audit	To identify the outcomes of the SEA and RLTS process	Ex-post evaluation of the results of the SEA and planning processes; overall measure of success or shortfall
<i>Source: adapted from Sadler 2004.</i>		

Given that collection of monitoring data can be complex and expensive, in the first instance activity should focus on the potential impacts of most concern. Monitoring design should begin during scoping when reference points (trends and conditions) are established for undertaking some or all of the following:

- tracking environmental changes that occur during strategy implementation,
- checking environmental changes are within expected limits or regulatory standards,

- facilitating corrective actions where there are unexpected impacts,
- determining the effectiveness of any mitigation measures,
- identifying the environmental outcomes achieved.

At the strategic level, monitoring needs to be adapted to scale. Some impacts of an RLTS will be linear such as those associated with a road network. These can be monitored at an ecosystem level using GIS or other means of tracking changes over time. Other impacts will be concentrated spatially, such as emissions associated with traffic concentration in urban areas. These can be monitored at known 'black spots' or representative locations using established scientific protocols.

Monitoring to detect whether or not sustainability outcomes are being achieved will require the use of indicators. Traffic volume, safety and other indicators can be used, supplemented by more refined measures. Further work is needed to develop the environmental and social indicators of sustainability in New Zealand. In the interim, some appropriate combination of existing measures may be used to test whether an RLTS leads towards or away from sustainability goals. LTNZ has identified a number of factors to measure the extent strategies and programmes are contributing to the LTMA's objective of environmental sustainability (Transfund New Zealand September 2004). These factors include:

- landscape/townscape effects,
- historic and cultural heritage effects,
- biodiversity effects,
- noise and vibration effects,
- air and water quality,
- effects on non-renewable resources.

The sustainable development indicators being developed by Statistics New Zealand provide another potentially useful resource when setting sustainability indicators for RLTS monitoring purposes.

#### **4.3.9 Public participation**

Undertaking an SEA-based RLTS process will demand a greater level of public involvement compared with previous strategy development processes. The benefits of involving the public are recognised in the LTA, which places an obligation on those preparing RLTSs to take into account the need to provide early and full opportunities for public participation in strategy development.

Amendments to the LTA have also broadened the composition of RLTCs to include a wider range of public interests. Under section 178 of the Act, each RLTC must include “suitable persons” appointed by the regional council to represent the objectives of environmental sustainability, public health, access and mobility. Cultural interests must also be represented.<sup>34</sup>

Notably, the LTMA includes a set of consultation principles (schedule 2) which emphasise the need for consultation processes to provide the public with:

- reasonable access to information,
- relevant information,
- a reasonable opportunity to present their views,
- reasons for decisions made.

The principles also highlight the importance of actively encouraging public involvement throughout the process.

To assist in meeting legislative obligations, RLTCs could usefully adopt a more proactive approach to public participation. In the first instance, a consultation plan should be drawn up to address the following questions:

- Who should be involved?
- What level of public involvement is appropriate?
- How should the public be involved?
- When and where should opportunities for public involvement take place?

A mix of methods is usually required as part of a systematic process of public involvement. In defining an approach, the strengths and weaknesses of different methods should be taken into account (Table 4.12). The process should be tailored to the audience as well as to the sequence of planning activities. For example, the use of mass media may be the best way to launch a public involvement process and keep the general public informed. More interactive techniques, such as community advisory groups, can be used to engage those who have a particular interest in the planning or assessment process and its outcomes.

The LTMA (schedule 2) identifies four stages when consideration could usefully be given to public views. These stages are:

- when problems are being identified and objectives set,
- when options are being identified,
- when options are being assessed and proposals developed,
- when proposals are being adopted.

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<sup>34</sup> Under amendments passed in 2004, each regional council must appoint a sufficient number of persons to represent a balance of objectives. Appointees must be from the wider regional community and must not be representatives of the regional council, territorial authorities in the region, or Land Transport New Zealand.

These stages are similar to what could be expected in an SEA process. In the early stages of SEA, public input can assist in ensuring the full range of environmental issues are identified and that environmental objectives reflect community aspirations.

Public input is also valuable when options are being identified and assessed. At this point, the public can help identify more environmentally sustainable options and ensure the assessment process takes into account relevant environmental criteria.

Ideally, there should also be an opportunity for public scrutiny before proposals are formally adopted. Another potential point for public involvement is in strategy monitoring. At this stage, community involvement can assist in providing information on whether strategic actions are being implemented effectively.

Key opportunities for public engagement in the SEA process are identified in Table 4.11.

**Table 4.11 Key stages for public involvement in SEA.**

<b>Step in process</b>	<b>Reasons for public engagement</b>
Setting environmental objectives	To ensure environmental objectives reflect community aspirations
Scoping	To ensure all significant issues are identified, local information about the environment is gathered and major alternatives for achieving objectives are considered
Assessment of alternatives	To identify information on likely impacts and preferences regarding the best practicable environmental option
Quality review and decision making	To provide a check on the quality of the process and the information available for decision making
Implementation and monitoring	To provide feedback on the effectiveness of plan implementation and outcomes

## **4.4 Summary**

To facilitate the uptake of SEA, the emphasis of this chapter has been on the flexible adaptation of SEA methods and techniques. Table 4.13 summarises key actions suggested to integrate SEA into RLTS development rather than operate as a separate, parallel procedure. The methods summarised in this chapter illustrate the range of practical tools available for this purpose.

Table 4.12 Techniques for public participation.

Technique	Description and use	Advantages	Disadvantages
<b>Level 1. Education and information provision</b>			
Leaflets/brochures	Written material used to convey information. Care should be taken in establishing the boundaries of distribution.	Can potentially reach a wide audience or be targeted towards particular groups.	Information may not be readily understood and may be misinterpreted. May be treated as junk mail.
Newsletters	Written material used to convey information that may involve a series of publications. Care should be taken in establishing the boundaries of distribution.	Flexible form of publicity that can be designed to address the changing needs of the audience. Useful to support liaison groups. Potential for feedback.	Not everyone will read a newsletter.
Unstaffed exhibits/displays	Exhibits or displays set up in public areas to convey information.	People can view the displays at a convenient time and at their leisure. Graphic representations, if used, can help people visualise proposals.	Information may not be fully understood or be misinterpreted. No staff available to respond to questions or receive comments.
Advertising	Advertisement placed to announce proposals, arrangements for meetings and other activities.	Depending on the circulation of the publication, the advert could potentially reach a large audience.	The information will only reach those who read the publication in which the advert is placed. Only limited information can be provided.
Local newspapers	An article published in a local newspaper to convey information about a proposed activity.	A potentially cheap form of publicity and means of reaching a local audience.	Circulation may be limited. There may be problems associated with the misinterpretation of information.
National newspapers	An article published in a national newspaper to convey information about a proposed activity.	Potential to reach a very large audience.	Unless an activity has gained a national profile, it may be of limited interest to the national press and a national audience.
Television and radio	Use of television or radio to convey information about a proposed activity.	TV and radio have a potentially large audience. People may be more likely to watch or listen to a broadcast than read leaflets and brochures.	Broadcasts alone may be insufficient. Further information may need to be made available in other forms so that people can find out more about the issues raised. Relatively expensive.
Video	Production of a video to convey information. May incorporate computer graphics and other images.	Under the control of the producer. Can be watched at the viewer's convenience.	Can be perceived as biased propaganda. Relatively expensive to produce if the final product is to look professional and credible.
Site visits	Organised site meetings to provide first hand experience of a particular activity and the issues involved.	Issues brought to life through real examples.	Often difficult to identify a site which replicates all issues under consideration. Not suitable for large groups of people.

Level 2. Information feedback			
Staffed exhibits/displays	Exhibits or displays set up in public areas to convey information and staffed by specialists who can provide information, answer questions and receive comments.	People can view the displays at a convenient time and at their leisure. Graphic representations, if used, can help people visualise proposals. One to one contact can be achieved. Particular groups can be targeted e.g. residents directly affected.	Requires a major commitment of staff time. May attract a small proportion of third parties.
Staffed telephone lines	A telephone number for people to call to obtain information, ask questions or make comments about proposals or issues.	A convenient way of receiving comments from interested parties. Not intimidating, therefore easier for people to participate and provide comments. Promotes a feeling of accessibility.	Discussions over the telephone may not be as good as face-to-face. Operating staff may not have technical knowledge available to respond to questions.
Internet	A web-site on the internet used to provide information or invite feedback. Care should be taken to keep the information up to date. More interactive forms of participation on the internet may also be developed, e.g. on-line forums and discussion groups.	The audience is potentially global. Costs are reduced as no printing or postage costs are incurred. A convenient method of participation for those with internet access.	Not all interested parties will have access to the internet, therefore alternative means of information dissemination will also be required.
Public meetings	A gathering of interested and affected parties to present and exchange information and views on a proposal.	If run well, can provide a useful way of engaging with the community. Demonstrates the proponent is willing to meet with other interested parties.	While appearing simple, can be complex and unpredictable. Public meetings can be intimidating and may be hijacked by interest groups or vocal individuals. May result in no consultation, only information provision.
Surveys, interviews and questionnaires	Encompass a range of techniques for obtaining information and opinions. May be self-administered, conducted face-to-face, by post or over the telephone.	Can gather information from people who would not attend public meetings or become involved in other activities. Confidential surveys may result in more candid responses. Can identify existing knowledge and concerns.	Can have a poor response rate. Responses may not be representative and only reflect opinion at that time. Opinions may change. Designing and administering a good survey/questionnaire can be costly and time consuming.

Level 3. Involvement and consultation			
Workshops	Meetings for a limited number of participants which can be used to provide background information, discuss issues in detail and solve problems.	Can provide a more open exchange of ideas and facilitate mutual understanding. Useful for dealing with complex, technical issues and allowing more in-depth consideration. Can be targeted at particular groups.	To be most effective, only a small number of individuals can participate. Full range of interests unlikely to be represented.
Focus groups/forums	A meeting of invited participants designed to gauge the response to proposed actions and gain a detailed understanding of people's perspectives, values and concerns.	Provides a quick means of gauging what public reaction to a proposal is likely to be.	Selection of group members may exclude some sectors of the community. Groups require facilitation and process can be time consuming.
Open-house	Interested parties are encouraged to visit a designated location, e.g. at a site or operational building, on an informal basis to find out about a proposal and provide feedback.	An effective way of informing the public and other interested parties. People can visit at a convenient time, view materials and ask questions at their leisure.	Preparation for and staffing of the open house may require considerable time and money.

<b>Level 4. Participation</b>			
Community advisory/liaison groups	Small groups of people representing particular interests or areas of expertise, e.g. community leaders, meet to discuss issues of concern and provide an informed input.	Can consider issues in detail and highlight the complexities involved. Promotes a feeling of trust.	Not all interests may be represented. Requires commitment from participants. A longer-term process requiring more resources than some other methods.
Citizen juries	A group of citizens brought together to consider a particular issue. Evidence is received from expert witnesses and cross-questioning can occur. At the end of the process a report is produced, setting out the views of the jury, including differences in opinion.	Can consider issues in detail and in a relatively short period of time.	Not all interests may be represented. Limited time scale may limit time available for participants to fully consider information received.
Consensus conference	A forum at which a citizens' panel, selected from the general public, questions 'experts' on a particular topic, assesses responses, discusses the issues raised and reports its conclusions.	Can provide a unique insight into the ways in which issues are perceived by members of the public. Suited to dealing with controversial issues of public concern.	Not all interests may be represented. Limited timescale for consideration of issues.
Visioning	A technique for developing a shared vision of a desirable future for a local community.	Develops a common view of future needs. Promotes trust and a sense of purpose.	Lack of control over the outcome. Needs to be used in the early stages of the decision-making process.
<i>Source:</i> (UK) Institute for Environmental Management and Assessment 1999.			

N.B. Table 4.12 shows four levels of techniques for public participation. At level 1, the methods shown are simple and generally involve one-way communication with the public. The degree of public communication increases at levels 2 and 3, progressively providing for more public input. At level four, the methods shown aim to provide for direct public involvement in decision-making processes.



**Table 4.13 Suggested actions to integrate SEA.**

<b>Key components of effective SEA</b>	<b>Actions required</b>
Developing environmental objectives	Identify clear environmental objectives to lead the RLTS process
Scoping	Use scoping to identify the key issues requiring detailed analysis
Establishing an environmental baseline	Review available information, determine further data needs and effective collection methods
Consideration of alternatives	Identify alternatives consistent with achieving environmental objectives and sustainability goals
Environmental assessment	Assess the environmental impacts of each alternative, including indirect and cumulative impacts
Quality review	Carry out review of the quality of environmental information used in the RLTS process
Decision making	Follow an open and transparent process giving due weight and attention to environmental considerations and ensuring reasons for decisions are evident and documented
Monitoring	Focus on the impacts of most concern (as identified through scoping) and monitor against baseline reference points
Public participation	Identify who should be involved, at what level, by what means and when

## 5. Conclusions and recommendations

*The basic idea of appraisal has been knocking around for a long time...The idea is when you [begin a] policy or plan you take a step back and say 'Hang on, what is this going to do for objectives that we take seriously...water resources, greenhouse emissions and so forth' (Roger Levett quoted in Thomas 2004).*

Over the last decade, international experience has highlighted the contribution that SEA can make to environmentally sustainable transport outcomes. In essence, SEA is designed to provide information to support sound decision making and ensure that environmental considerations are taken into account. In advanced applications, social effects are also addressed opening the way to the wider application of SEA in support of sustainable development.

### 5.1 Value of SEA

Table 5.1 summarises the key ways SEA can add value to policy and planning processes.

**Table 5.1 Value added to strategic decision making by SEA.**

SEA elements	Value added
Developing environmental objectives	Ensures the process focuses on desired environmental outcomes
Establishing an environmental baseline	Assists in identifying environmental problems and provides a base for impact prediction and monitoring
Scoping	Ensures the process focuses on key environmental issues
Consideration of alternatives	Assists in identifying environmentally sustainable alternatives
Environmental assessment	Provides a systematic process for assessing the environmental impacts of alternatives
Quality review	Ensures the environmental information used to inform decision is reliable and robust
Decision making	Provides information to support sound decision making and ensures the reasons for choices are evident
Monitoring	Ensures appropriate environmental monitoring mechanisms are put in place and deliver required information
Public participation	Ensures objectives reflect community aspirations, assists in identifying environmental problems and alternative courses of action, and provides a "check" on decision making

*Source:* adapted from Therivel 2004, pp.49-50

Analysis of RLTS preparation in the three case study regions has assisted in identifying similarities between the steps in strategy development and steps in a typical SEA. Common elements that can be identified include the development of environment objectives, the use of a process to consider alternatives and the opportunities for public participation.

The analysis also served to highlight key areas where environmental assessment could be improved in the future. In general, the approach to environmental assessment in the case study regions was limited. Analysis of RLTS preparation against the SEA checklist found:

- Environmental objectives tended to be of a general nature, lacking sufficient definition to guide strategy development.
- Scoping of environmental issues and collection of baseline data focused on a narrow range of considerations.
- Alternatives were developed primarily in response to existing problems rather than as a way of achieving environmental goals.
- A limited set of environmental criteria was used to evaluate alternatives.
- Opportunities for public participation were of variable quality and inclusiveness.
- Monitoring measures were insufficient to assess whether the strategy was achieving intended results.<sup>35</sup>

These results highlight the need for a more systematic approach to environmental assessment, such as that provided by SEA. The case for SEA is strengthened when the requirements of legislation are taken into account. Under the LTA, regional councils are now required to prepare RLTSs that take into account environmental sustainability and contribute to a sustainable land transport system. By providing a stronger framework for environmental assessment, SEA can assist councils in meeting these obligations.

The SEA tool kit contains a range of methods that can be used to strengthen RLTS development. These include established techniques, such as simple checklists, that are widely used internationally. Drawing on methods best suited to domestic requirements, a 'made in New Zealand' approach to SEA could be developed for RLTS purposes.

While this report has focused primarily on environmental assessment, SEA provides a framework that can be adapted to address the social impacts of transport. Given the legislative requirements for RLTSs to take into account a range of social considerations such as access, mobility and public health, SEA could usefully be extended to include these issues.

More broadly, SEA can also be seen as an entry point for sustainability appraisal in support of sustainable development. Sustainability appraisal is an evolving framework for considering the economic, environmental and social impacts of policies and plans. SEA can be seen as a pathway towards sustainability appraisal.

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<sup>35</sup> In considering these findings, it needs to be emphasised that the RLTSs selected as case studies were not prepared using SEA. The SEA checklist was applied retrospectively as a means of examining existing practice and identifying opportunities for SEA integration in future RLTS development.

## 5.2 Facilitating SEA – Next steps

To date, experience of SEA in New Zealand has been limited. As a result, knowledge of SEA methods and tools is not widespread. This research project has made a modest contribution to raising awareness of SEA within the transport policy and planning community.<sup>36</sup> However, the researchers recommend further work should be undertaken to develop SEA knowledge and skills. To facilitate the understanding and use of SEA, the researchers have identified the following steps.

### 5.2.1 Piloting SEA

To provide an opportunity for 'hands on' application and build familiarity with methods and tools, a recommended next step is to pilot SEA in an RLTS process. A pilot could be done with one or more regional councils. Key stages in strategy development where SEA could usefully be trialled include the:

- development of environmental objectives,
- scoping of environmental issues,
- establishing an environmental baseline,
- identification and assessment of alternatives,
- design of public participation processes.

In addition to building skills of regional council staff, the pilot would help identify resource requirements needed to enable SEA methods and tools to be applied effectively in future RLTS reviews. As an interim step, councils could begin by trialling SEA approaches in sub-strategy studies such as corridor plans. The experience gained could then be applied when the council is reviewing its RLTS. The pilot process would also be useful in identifying areas where national guidance is needed.

### 5.2.2 Building capacity for SEA

To enhance the resource and skill base necessary for effective SEA, assistance from central government (through the Ministry of Transport and/or Land Transport NZ) could be usefully provided. In addition to developing guidance on SEA application, assistance could be directed towards ensuring the supporting elements for effective practice are in place.

As discussed in Chapter 4, key supporting elements for SEA include:

- **Baseline or background information** to help identify potential environmental effects of a proposed strategic action.

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<sup>36</sup> In addition to the three case study councils, the project has endeavoured to include other agencies with responsibilities for transport planning. This has been done primarily through the project workshop held in Wellington on 17 March 2005. The workshop was hosted by Wellington Regional Council and opened by the Minister of Transport, Hon. Pete Hodgson. It was attended by staff from the Ministry of Transport, Land Transport New Zealand, Ministry for the Environment as well as staff from Waikato and Wellington regional councils. Several regional councillors and RLTC members also attended. The workshop provided the opportunity for members of the transport policy community to provide input into and comment on the draft research results.

- **Headline indicators** to enable evaluation of whether environmental objectives are being met.
- **Policy frameworks** to facilitate consideration of alternatives in relation to environmental and sustainability commitments established at national level.

With respect to baseline data and monitoring, analysis of RLTS preparation in the case study regions showed limited environmental information was collected and used in strategy development. Often, there were significant gaps in data, exacerbated by limited provision for ongoing monitoring. Central government support would be useful in ensuring a consistent and comprehensive approach to data collection throughout the country.

The Ministry of Transport's 2003 report on land transport research needs also identifies baseline data and monitoring as areas where there are potential gaps. The report recommends further work should be undertaken to:

- identify the baseline data required to monitor successful implementation of the NZTS,
- create an inventory of available data to identify the nature of the data, where and how it is collected and who maintains it (Ministry of Transport 2003, pp.55-56).

Participants at the workshop held as part of this research project also identified the need for guidance and support in respect of baseline data collection and monitoring. Given that baseline data is critical for effective environmental assessment, such support would enhance councils' ability both to undertake effective SEA and to meet legislative requirements. Central government could usefully work with regional councils to identify priority areas for action.

### **5.2.3 Linking transport and land use planning**

Transport is a major consumer of land. Estimates compiled by the OECD suggest that 25 to 35% of land is devoted to streets in modern cities (OECD 1996, p.27). This estimate does not include land used for related transport purposes such as parking, which can raise the proportion of land paved for transportation to very high levels (ibid.). Land use patterns also impact on transport demand. Developing an integrated approach to land use and transport planning therefore has the potential to play a key role in delivering sustainable transport outcomes.

Previous research in this area suggests there is a lack of integration between land use and transport planning in New Zealand. While SEA provides a platform for enhancing integration, further research is needed to clarify the relationship between land use and transport frameworks. Research could usefully be designed to identify the ways that closer links can be made. A suggested framework for this research is to:

- identify and describe central and local government land use and transport planning processes that are undertaken on both a statutory and non-statutory basis,
- evaluate the relationship between land use and transport planning processes to identify linkages,

- review international arrangements to identify examples of good practice in land use and transport planning integration,
- develop a framework (or planning 'map') and supporting guidelines to illustrate ways that closer links can be made between land use and transport planning.

Such a project has the potential to directly benefit both central and local government organisations involved in land use and transport planning including regional councils, territorial authorities and Land Transport NZ.

#### **5.2.4 Encouraging public participation**

Public participation is widely recognised as a key principle of sustainability. At an international level, the role of public participation is recognised in Agenda 21 which identifies it as one of the "fundamental prerequisites for the achievement of sustainable development" (United Nations Conference on Environment and Development 1992, p.219).

Within SEA, public participation plays a key role in integrating the environment into decision-making processes. The importance of involving the public has also been recognised in recent amendments to the LTA. As previously discussed, the Act places an obligation on councils to take into account the need to provide early and full opportunities for public participation in RLTS development.

Anecdotal evidence gathered during the course of this research suggests there is a very low level of awareness of the LTA's provisions for participation. Analysis of RLTS development showed industry, commercial interests and road users have tended to be better represented in RLTS consultation processes than environmental and other public interest groups. Discussions with a range of interest groups suggest there is a need for better information and other resources to facilitate active community involvement in transport planning.

Research could usefully be undertaken to identify ways in which public participation could be enhanced. One option may be to make funding available to community groups to support their involvement. This could be similar to funding provided under the Education and Advisory Services Fund administered by the Ministry for the Environment.<sup>37</sup> This fund is aimed at facilitating community involvement in RMA processes. Under the fund, community and environmental groups can apply for financial assistance to develop information and education resources to enhance community participation.

Given the importance of public participation in ensuring environmental considerations are taken into account, efforts to enhance community involvement warrant further attention. As the agency responsible for administering the LTA, the Ministry of Transport has an important role to play in ensuring effective opportunities for the public to take part in transport planning. The success of the Ministry's efforts will, in turn, play a key role in delivering on the sustainability objectives of current legislation.

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<sup>37</sup> Additional information on this fund can be found on the Ministry's website at [www.mfe.govt.nz](http://www.mfe.govt.nz).

## Appendix: Canterbury Regional Land Transport Strategy development process

### A1. Introduction

Preparation of the Canterbury Regional Land Transport Strategy (RLTS) 2002-2007 (Environment Canterbury 2002b) commenced in June 1998 under the guidance of the Regional Land Transport Committee (RLTC). Strategy development took place over a period of around 45 months. Most of the development work was undertaken by a core team of five to six transport planners from the Christchurch City Council and Environment Canterbury, led by the latter's senior transport planner. The core team was informally constituted as the 'technical working group'.

At various stages, the core team involved a wider group of transport professionals from the city and regional council, the region's constituent district councils and Christchurch-based staff of statutory transport organisations (e.g. LTSA, Transfund New Zealand, Transit New Zealand). This wider group, comprised largely of transport planners, was referred to in reports as the 'stakeholder' group or the 'wider officers' group'.

As Christchurch city and its transport needs were central to the work of the RLTS, elected representatives and staff from the city council played an important role. Three Christchurch city councillors were on the RLTC and city council staff co-led the technical work.

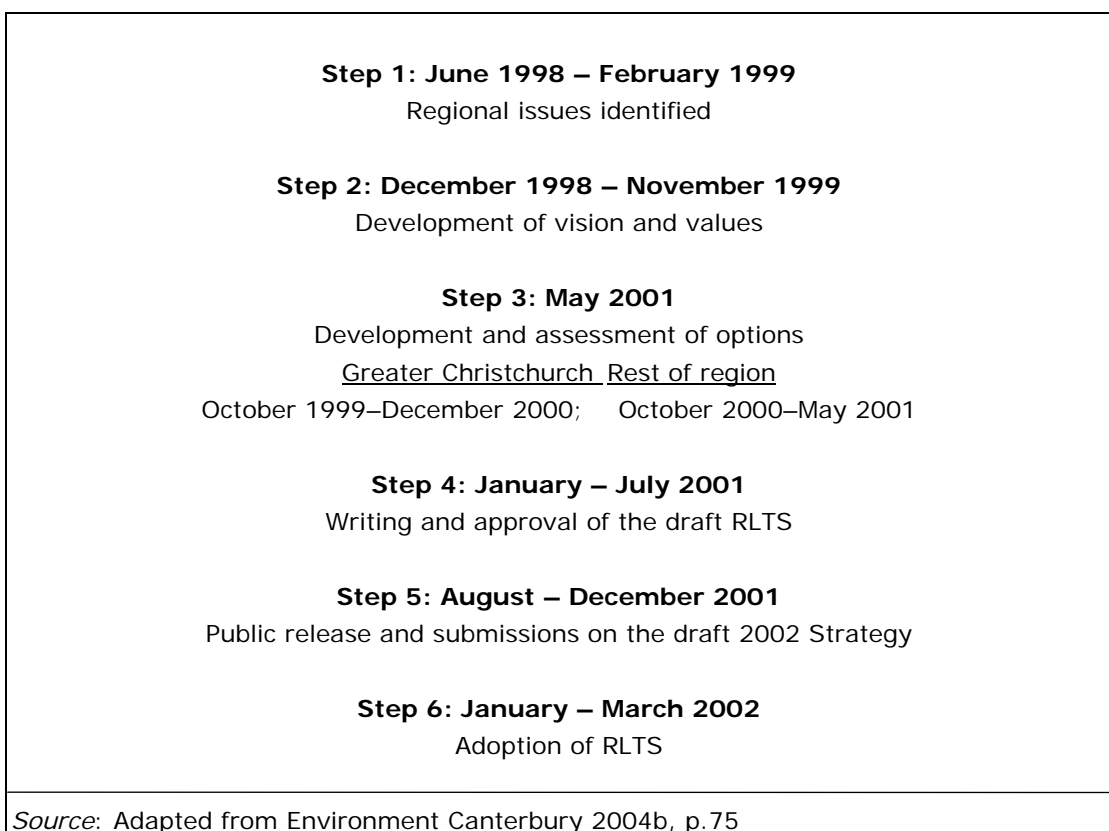


Figure A1 Summary of Canterbury RLTS development process.

The RLTS preparation process is summarised in Figure A1. A detailed description is provided in the following pages. This description is based on information provided in the draft 2005-2015 Canterbury RLTS and a review of unpublished reports and files and interviews with participants.

## **A2. Identifying regional issues**

Development of the RLTS began with the identification of issues regarding the region's land transport infrastructure and performance (Environment Canterbury 2004b, p.76). This process involved preparation by staff of 'issues discussion documents' for use in meetings with a Christchurch-based group (drawn from Christchurch city and nearby towns) and a non-metropolitan, regional group.

The issues discussion document concerning non-metropolitan areas was compiled by Environment Canterbury staff following informal meetings with transport and planning staff from district councils and statutory transport organisations. Consultation meetings were then convened in Amberley, Ashburton and Timaru.

Most attendees at these meetings were councillors and staff of district councils and representatives of statutory transport bodies. Other participants included representatives from the National Council of Women, Federated Farmers, Senior Citizens' Association, road user groups (Automobile Association, Motor Cycle Club), transport operators and other commercial organisations from around the wider Canterbury region. Liaison with Maori was initiated through Environment Canterbury's iwi liaison officer. However, iwi indicated they did not wish to take part in the RLTS process at that stage (ibid.).

Issues of importance for the Christchurch area were identified through monitoring of transport trends. Monitoring data offered information on key trends, particularly those identified as the 'principle drivers' behind the observed and potential growth in travel demand. Other documents identified as relevant to this part of the process were the Regional Policy Statement, Canterbury Regional Council Governance Outcomes, the National State Highway Strategy, the joint Christchurch – Environment Canterbury Public Passenger Transport Strategy, the Christchurch Cycle Strategy, the Christchurch Road Safety Strategy and the Christchurch City Council Strategic Statement and City Plan.

## **A3. Developing a vision, values and goals**

Following on from the issues identification process and overlapping with it in part, was a formal process of developing a vision and goals. In Christchurch, the group set up for this purpose was known as the 'Canterbury Dialogues Transport Vision Group' (TVG). It was based on a stakeholder group established by the Sustainable Cities Foundation, which was separately undertaking a visioning process for Christchurch City at the instigation of the Canterbury Employers Chamber of Commerce.

The TVG group met in small and plenary groups over six months with the guidance of a facilitator. The group was provided with monitoring data referred to above and additional material, including a light rail study commissioned by the city (Booz –Allen & Hamilton



1999b). The group sought and received information about road use, mode use by population group, public transport use and demographic trends. This information was presented in an unpublished report for the group entitled "Taking Stock – A summary of current transport organisations, responsibilities, plans, strategies and processes for greater Christchurch" (Canterbury Regional Council undated(a)).

The group worked over several weeks to produce a draft vision and goals for the RLTS. The draft vision and goals were reported back to regional participants in a second round of meetings in Amberley, Ashburton and Timaru. The outputs of the TVG and the regional meetings were combined to produce a recommended vision and values statement and distributed to all participants for final comment. Eight goals were also identified. Each goal included a short narrative identifying the means by which it could be achieved.

The vision and goals are reproduced in Box A1. The RLTC adopted the vision and goals for the draft RLTS in November 1999.

**Box A1 Vision and goals.**

**Vision** - To have and enjoy the best possible quality of life

**Goals**

- Goal 1 Equitable access for all sectors of the community
- Goal 2 An efficient and sustainable transport system that supports a thriving economy
- Goal 3 A transport system that promotes a social environment that is safe and supportive
- Goal 4 A transport system that is consistent with a healthy, pleasant and pollution free environment
- Goal 5 A transport system which is safe
- Goal 6 A transport system that values and encourages community participation
- Goal 7 Transport and land use planning are an integrated part of a process that takes account of wider community processes
- Goal 8 A transport system that encourages innovation and is responsive to change

The vision and values were subsequently publicised in an A1-sized poster entitled *Destination Canterbury: Planning Tomorrow's Transport* (Canterbury Regional Council undated(b)). The poster also outlined the strategy development process and provided background information, including information about transport trends in Canterbury. It was distributed to groups and individuals who had taken part in the process to date and sent to council offices, libraries and others. Feedback was invited by mail and telephone. However, there is no record of any submissions being received in response (Patrick Quinn, pers. comm.).

## **A4. Identifying and assessing options**

### **A4.1 Introduction**

Development of the strategy involved several rounds of traffic modelling and analysis with considerable technical input from Christchurch City Council staff (Environment Canterbury 2004b, p.76). A working group, comprising staff from Environment Canterbury and the City Council, identified, developed and modelled various transport scenarios (or 'options'), analysed data and evaluated likely costs and benefits (ibid.).

At intervals, scenarios were presented to the wider officers' group for consideration and feedback. This group was joined from time to time by experts from statutory transport bodies and other transport organisations. Some external consultants were also updated on the modelling approach used (ibid.).

The first round of assessment for the RLTS was initiated in October 1999 and went through to May 2000 (ibid.). This round focused on 'cartoon strategies' and involved two key tasks. The first task was to develop the 'cartoon strategies'. The second was to produce a set of assessment criteria to enable the strategies to be compared.

### **A4.2 Development of transport strategies and assessment criteria**

Transport planning staff began the process of producing "cartoon strategies" by developing a list of transport scenarios based on the experience and knowledge of the core team. After several meetings using large scale maps of the city and discussing demand trends and network issues, over 20 different strategies were identified. As some of these were considered to be either unrealistic or similar to another strategy, the 20 were reduced to nine (plus a 'do minimum') for the purposes of assessment (ibid., p.77).

The nine strategies developed for assessment in the first round are summarised in Table A1. They were described as being deliberately simplistic and intentionally "extreme" in nature, as they were designed to represent the primary building blocks that could be used in various combinations to achieve the RLTS vision.

Commenting on the strategies, the council noted:

*With the exception of strategy 8 (and arguably 6 and 7), it can be seen that these first round strategies were based on providing "carrots without the sticks". They may have given priority to one mode over another but did not aim to directly penalise or discourage other modes. For example, the public passenger transport strategies did not include parking restrictions to make it more difficult for car users. This was consistent with the "one-dimensional" nature of the strategies at this stage (Environment Canterbury 2004b, p.77).*

**Table A1 Initial options assessed (Round one).**

	<b>Title</b>	<b>Description</b>
0	Do minimum	Committed schemes and existing services only
1	Cars – free-flow roading	Build and manage roads and related infrastructure to provide for all car demands
2	High quality public passenger transport (buses/taxis only)	A public passenger transport-based strategy where public passenger transport is given priority over all other modes
3	High quality public passenger transport (including rail)	A public passenger transport-based strategy which includes a number of rail-based initiatives
4	Cycle dominant	A strategy based on making cycling a dominant mode
5	Pedestrian dominant	A strategy based on making pedestrian traffic a dominant mode
6	Concentrated land use	A strategy which uses more concentrated urban forms as the primary transport tool (NB: sensitivity testing on this may be a component of all strategies)
7	Full marginal cost pricing	A strategy that seeks to ensure that all modes pay the full marginal cost of use, including congestion costs
8	Demand management – regulation including strong parking management	A range of measures to reduce or change demand patterns based around restraints, regulation or charges
9	Demand management – education and advocacy only	A range of measures to reduce or change demand patterns based around education and advocacy
<i>Source: Environment Canterbury 2004b, p.77</i>		

Each of the strategies was then assessed by the wider officers' group against draft "objectives" derived from the RLTS visioning process and "a review of other plans, policies and transport strategies" (ibid.). The draft objectives were:

1. Mode share
2. Travel times and reliability
3. Safety
4. Availability of transport options
5. Affordability for users
6. Affordability for the regional economy
7. Cost-effectiveness
8. Reduction in pollutants
9. Maintenance of biodiversity
10. Free from crime and personal danger
11. Pleasant to use
12. Supports desired urban form
13. Facilitate social interaction
14. Empowerment and participation

15. Innovative and responsive to change
16. Resilient to disruption

These criteria appear in various forms and combinations in later stages of the process.

#### **A4.3 Analysis of scenarios**

The scenarios were populated with information using computer models (for private and goods vehicles and mode split), spreadsheet analysis (for public transport, cycling, total revenue and expenditure), and qualitative assessment (for intangibles and items that could not be directly measured).

Two computer models were used. The principal model was the Christchurch Transport Study (CTS) model. It was developed initially by Environment Canterbury and Transit New Zealand and subsequently strengthened by the city council. It is a traffic model for assessing road strategies and expected effects of land use changes on the road network but has limitations in assessing non-road strategies. The second model used is a simple (three zone) mode split tool known as the Transport Policy Model (TPM).

Simply stated, the CTS model is a travel demand model designed to estimate road network demand from private motor vehicle use. Responding to "instructions" based on different scenarios, it uses household travel survey data on individual and family travel behaviour to generate car trips between 350 geographic zones and then assigns them to road networks. It calibrates the projections by testing against known (historic) information based on actual observations and measurements.

Modelling work on future vehicle emissions was carried out using Environment Canterbury data and results used to analyse carbon dioxide (CO<sub>2</sub>) and carbon monoxide (CO) emissions. Information generated from the models and/or assembled from other sources was used to assess how well the scenarios met the 16 draft "objectives".

#### **A4.4 Assessment criteria**

The 16 draft 'objectives' assembled from analysis of the goal statements were used as the foundation for the assessment process. Consultancy firm Booz-Allen & Hamilton was engaged to assist with the production of assessment criteria for each of the objectives. In this process, objective 1 (mode share) was set aside. Objective 2 (travel times and reliability) was split into two (low travel times and reliable travel times, criteria used in Transfund's benefit cost calculations). Objective 14 (empowerment and participation), objective 15 (innovative and responsive to change) and objective 16 (resilient to disruption) were judged to be 'process objectives' and set aside. One new objective, "integration between urban and peri-urban transport needs", was added.

The revised assessment criteria were:

1. Low travel times
2. Reliable travel times
3. Safety
4. Availability of transport options
5. Affordable transport options for all users

6. Affordable to the regional economy
7. Cost-effective
8. Reduction in pollutants
9. Maintenance of biodiversity
10. Free from crime and personal danger
11. Pleasant to use
12. Supports desired urban form
13. Facilitate social interaction
14. Integration between urban and peri-urban transport needs

The consultants recommended that objectives 1 to 8 be evaluated numerically. Objectives 9 to 14 were described as highly or particularly subjective and it was recommended that they be evaluated on a five point scale (from - - to + +) (Booz-Allen & Hamilton 1999a).

#### **A4.5 Assessment**

For each of the nine cartoon strategies and the 'do minimum', an assessment was made of the extent to which they assisted in meeting the 14 objectives. This work entailed agreeing on key assumptions then running the models to identify 'network or service improvements' required to 'implement' the scenario. Following this, the probable cost was calculated using information provided by Transfund and other sources on road infrastructure.

Although consultants had recommended the assessment record quantitative values and qualitative scoring in the same process, council staff concluded that extra and unjustifiable weight might be given by political and stakeholder groups to quantitative values and decided to undertake and record the whole assessment using the five point qualitative scale.

Results of the analysis were reported to the wider officers' group and elected members for discussion and feedback. Assessment results highlighted that no single solution would achieve the objectives. It was therefore concluded that various combinations of components would be required (Environment Canterbury 2004b).

### **A5. Round 2 assessment**

#### **A5.1 Introduction**

The Round 2 assessment commenced with the development of a narrower range of scenarios designed to respond to an anticipated increase in trip numbers on the network. On the advice of consultants, the scenarios were based on combinations of three core elements:

- provision for cars,
- alternatives to cars,
- car restraints.

The range of scenarios was constructed to show how each element contributed to or interacted with other elements. Two further elements were introduced:

- travel behaviour changes (trip reduction),
- land use change.

**Box A2 Round 2 scenarios.**

**A. Substantial capacity increase for private motor vehicles**

This strategy catered for increased traffic growth by providing substantial increases in road capacity for private motor vehicles. Existing public passenger transport services would continue but there would be no significant improvement or additional services. No particular priority would be given to public passenger transport (PT), cycle or pedestrians and no restraint measures would be imposed on cars.

**B. Capacity increase for private motor vehicles, improvements for cycling and public transport**

This strategy would also increase the road capacity for motor vehicles, but to a lesser extent than that proposed in strategy A. There would be improvements to cycle and public passenger transport networks along the lines outlined in the Christchurch City Cycle and Public Passenger Transport Strategies but no restraint measures would be pursued.

**C. Strategy B with some constraints on private motor vehicle use**

Same or similar levels to B regarding car, pedestrian, public passenger transport and cycle infrastructure and service provision but some restraint would be introduced. The restraint measures were envisaged as possibly taking a number of forms such as increased parking charges or road pricing.

**D. Minimal capacity increase for private motor vehicle, improvements for cycling and public transport**

Minimal new capacity for cars with commensurate increases in other modes and heavy restraint measures such as parking charges and placing a toll on the Waimakariri River bridge. It was accepted that this strategy was likely to be the most difficult to assess as it represented a quantum shift from current direction.

**E. Business as usual**

Minimal new capacity would be provided for cars. Existing cycling, pedestrian and public passenger transport services would continue improving along recent trends but with no significant improvement or additional services. No particular priority would be given to PT, cycle or pedestrians and there would be minimal restraint measures imposed on car use.

*Source:* Environment Canterbury 2004b.

From this work, four scenarios or strategies plus a business as usual case were identified for assessment. Box A2 describes the scenarios modelled. In brief:

*Comparison between options A and B provided an indication of what may be achieved by redirecting some expenditure away from providing for more cars*

into alternative means of travel. Strategy C used the same expenditure patterns as B but introduced demand restraint measures. Strategy D consisted of a major redirection of expenditure away from cars and into alternatives supported by strong demand restraint measures (Environment Canterbury 2004b, p.79).

## A5.2 Refining the assessment criteria

For stage 2 of the modelling process, transport planners refined the assessment criteria for six of the eight goal areas. The other two goal areas of community engagement and innovative/responsive to change were considered process goals and not useful for determining between scenarios. Table A2 lists the criteria used.

**Table A2 Round two assessment criteria.**

<b>Goal One: Equitable Access</b>	
Travel times	Total vehicle minutes Travel times on specific routes Estimated changes in cycle, bus times
Users, costs	Generalised cost per trip
Reliability	Lane km at Level of Service E or worse <sup>38</sup>
Safety	Total cost Exposure
Total costs per annum	Combined costs of travel time
Availability of transport options	Qualitative based on barriers to use of each mode (e.g. Buses: travel times; exposure to weather in walk/wait times; quality of fleet; etc. Cycles and walk: safety; availability of directness of routes). Generalised cost per trip
Mode share	Car, cycle and bus
Facilities for transport disadvantaged	Qualitative (based largely on overcoming barriers for movement of disabled, elderly, young or low income groups)
<b>Goal Two: Thriving Economy</b>	
Access for people (workers, customers)	Travel times on arterial routes
Access for freight	Travel times on key freight routes Total lane kms of Level of Service E or worse
Total costs	Vehicle operating costs Travel time costs Capital/infrastructure costs Maintenance

<sup>38</sup> Canterbury identified six levels of service relating to the flow of traffic on the road network. Level of service A represented free flow, or the 'best' operating conditions, while level of service F represented the 'worst' conditions.

	Fares/tolls/parking charges
Public finance costs	Public revenue and expenditure
Attractive to live and invest	Qualitative
<b>Goal Three: Social Environment</b>	
Pleasant urban environment/severance/free from crime/sense of community/facilitates social interaction	Qualitative (based largely on degree of emphasis on car use)
Facilities for transport disadvantages	Qualitative (based largely on overcoming barriers for movement of disabled, elderly, young or low income groups)
<b>Goal Four: Physical Environment</b>	
Global pollutants	CO <sub>2</sub> emissions
Localised pollutants	CO emissions (adjustments made based on Vehicle Fleet Emission Control Strategy)
Quality of urban environment	Qualitative (based largely on degree of emphasis on car use)
<b>Goal Five: Safety</b>	
Social cost of crashes	Total cost of crashes
<b>Goal Seven: Integrated Planning</b>	
Consistency with other planning documents	Qualitative (based on review of objectives, policies and targets in other planning documents)
Consolidated urban form	Qualitative assessment
<i>Source: Environment Canterbury 2000a, pp.6-7</i>	

### A5.3 Assessment assumptions

A number of assumptions underpinned the analysis and modelling. Car ownership was assumed to be the same for each scenario as was the total number of trips. The cost of fuel was assumed to be unchanged in 2021 or at least not to influence motor vehicle use if it did increase. Changes in the fuel use profile or the fuel consumption of the motor vehicle fleet through to 2021 were built in with reference to the Ministry of Transport Vehicle Fleet Emission Control Strategy.

Three land use scenarios were also developed for sensitivity testing, based in part on work commissioned from consultants Gabites Porter (2000). These were:

- A continuation of current trends was used as the base scenario to test each option. This included a mixture of in-fill and new developments outside the current urban areas.
- A dispersed development pattern where there would be less in-fill and more development around the city fringe. This would be accompanied by a dispersal of jobs from the central city to surrounding areas.



- A 'nodes and corridors' development pattern. This would see less new green-field development with more redevelopment concentrated around the central city and suburban nodes.

To reduce the number of model runs, not all transport strategies were tested against all land use scenarios. Only land use scenarios that were considered to complement each of the strategies were used.

#### **A5.4 Analysis and assessment**

The CTS model was run for each scenario. Output from each model run provided the following information:

- total vehicle time,
- total vehicle distance,
- travel time on selected routes,
- cost of travel (total cost, operating cost, time cost, cost/trip),
- CO<sub>2</sub> and CO emissions,
- road distance within each level of service category,
- volumes of traffic and delays on each link/turning movement.

Results from spreadsheet analysis provided the following:

- average travel time for all modes,
- travel time costs,
- operating costs,
- public expenditure and revenue (infrastructure/maintenance costs, revenue from fares/tolls).

Qualitative assessment was used to measure:

- reliability of travel (car, bus, cycle, walk),
- availability of transport (car, bus, cycle, walk),
- facilities for the transport disadvantaged,
- comfort and personal danger,
- severance,
- urban environment,
- integration with land use.

Using this information:

- Goal One, equitable access, was assessed using a mixture of qualitative and quantitative data, predominantly the latter.
- Goal Two, thriving economy, used quantitative data only.
- Goal Three, social environment, was assessed using "pleasant urban environment/social interaction", "severance", "free from crime", "sense of community" and "facilities for the transport disadvantaged". "Severance", "pleasant urban environment" and "sense of community" were assessed using a simple proxy of "more or less traffic on the road".

- Goal Four, natural and physical environment, was assessed using emissions of CO and CO<sub>2</sub> and “quality of the urban environment” (as compared to “pleasant urban environment” in Goal Three above). Emissions data was calculated based on modelling and “quality of urban environment” on mode split.
- Goal Five, safety, used mainly qualitative information.
- Goal Seven, integrated planning framework, was judged qualitatively based on a review of objectives, policies, and targets in other planning documents including the Christchurch Public Passenger Transport Strategy, the Christchurch City Cycle Strategy, the Regional Policy Statement and the transport objectives and policies in the Proposed Christchurch City Plan (as amended by decisions in May 1999).

A numeric score of 1 to 5 (1 being very poor, 5 being excellent) was used for the qualitative assessment criteria. Quantitative results were similarly scored on a 1 to 5 scale. An overall ‘score’ per goal on the - - to + + scale was then assigned to each scenario. The results for round two are shown in Table A3. All scoring was done using an informal ‘expert group’ process.

**Table A3 Second Round Assessment Summary.**

Goal Summary	A	B	C	D
Equitable Access	-	0	0	+
Economy	+	0	0	--
Social	--	0	0	++
Environmental	--	-	0	+
Safety	0	0	0	0
Integrated Planning	--	0	0	++
<i>Source: Environment Canterbury 2004b, p.79</i>				

The second round assessment report concluded Strategy D was generally considered to perform best, except in the area of economy. Comparatively, Strategy A was generally the worst, except for economy (Environment Canterbury 2000a).

### A5.5 Consultation on the scenarios

Consultation on the scenarios was undertaken over a two-month period with groups identified as ‘key stakeholders’. Participant groups included the Automobile Association, Airport Company, Red Bus, the Canterbury cyclists association (SPOKES), Transit, territorial authorities, the Christchurch Chamber of Commerce and Transfund (Environment Canterbury 2004b).

The council’s purpose in holding meetings at this point was to get feedback on the proposed direction emerging from the assessment work (ibid.). Two evening and two day-time workshop style meetings were held. A supporting booklet called *The Road We’re On* was also produced. The booklet outlined the background to the process and invited expressions of interest in further consultation. It was distributed to all individuals involved in the process to this stage (ibid.).

This process was complemented by focus group research undertaken by a market research company. The focus groups involved a representative sample of 45 members of the public. Three focus groups were set up consisting of:

- young singles aged 18-24,
- those with dependent children aged under 13, and
- those aged 40-60.

In addition, six “in-depth” interviews were conducted with elderly people (aged over 65) (ibid.).

## **A6. Round 3 assessment**

### **A6.1 Introduction**

Of the four broad strategies included in the second round of analysis, the RLTS core group concluded that the strategy that gave the best overall results against the goal areas was Strategy D (Environment Canterbury 2004b, p.80). This was the scenario that provided minimal new capacity for cars with commensurate increases in other modes and heavy restraint measures. Although Strategy D best satisfied the goals, the results suggested there was potential for further improvement. Based on the results of Strategy D, three new options were developed for round three assessment as follows:

- **Strategy E** was developed to balance the strengths of strategies A and D. This involved more, but still minimal, capacity for cars with commensurate increases in other modes and heavy restraint measures such as parking charges and road pricing. Strategy E aimed to have 83% of trips made by car mode by 2021.
- **Strategy EA** represented a more ambitious version of Strategy E and aimed to have a greater shift in trips from private car to alternative modes, reducing car trips to about 60% of total trips.
- **Strategy EB** was a refined version of EA and assumed a similar mode split but with a slight increase in car and PT travel, with a corresponding reduction in cycling.

For comparison with current trends, the business as usual strategy was also included in the analysis.

### **A6.2 Assessment**

The strategies were again assessed against the six goal areas contained in the vision statement, as outlined above. The assessment was based upon a combination of quantitative and qualitative analysis. As discussed in Section A5.4 above, quantitative analysis included factors such as private expenditure (calculated as the combination of vehicle operating costs (VOC), travel time costs, fares, tolls and parking charges) and public expenditure (derived by estimating capital and operating costs associated with each mode). Revenue expected from fares, parking charges and tolls was also calculated. Qualitative assessment was done using either a ranking scale from 1 to 5 (1 = very poor, 5 = excellent) or by describing the expected outcomes (ibid.).

The council’s summary of the RLTS development process observed:

*Some of the goals are mutually exclusive and so, consequently, no strategy is capable of satisfying all goal areas and, therefore, must be a compromise. The preferred strategy (EB) appeared to be a reasonable compromise in achieving good results against each of the Key Goal Areas. Of the three variations of the preferred Strategy tested, EA appeared to be the best overall, however, it was considered likely to be too ambitious with mode split targets that are not practically achievable (ibid.).*

Strategy EB was considered to have mode split targets that were judged more realistic and came to represent the 'preferred strategy'.

## **A7. Preparing the draft RLTS**

With modelling and assessment complete, the core team began preparing the draft RLTS. This work was guided and instructed by standard engineering publications including *Guidelines for Developing Transport Strategies* (The Institution of Highways and Transportation (UK)1996). Christchurch City Council members of the core group had little involvement at this stage.

The first step in the process was to identify 'key result areas' for the strategy. These were grouped under the following five headings:

- alternatives to cars,
- roads: infrastructure, safety and environment,
- demand management,
- land use planning,
- freight.

Targets for each of these key result areas are shown in Box A3.

The next step was to develop policies and methods for implementing the strategy. These were assembled under the five key result area headings. Added to the policies and methods were specific, major projects for the period 2001-2006 where there was political or funding commitment for them.

The vision, values and goals, a section on current trends and issues for Canterbury, and the targets, policies, methods and major projects comprised the draft RLTS. The trends and issues section included the following reference to environmental issues:

*The increased use of motor vehicles has consequences for our environment. Vehicle emissions of carbon dioxide, a major greenhouse gas, have increased by 43% over the last 10 years despite significant improvements in engine technology and energy efficiency. More travel and increasingly sophisticated vehicles have more than offset the gains from technology, leading to an increase in energy use and carbon dioxide emissions. There is widespread concern over traffic noise, smoky vehicles, and community severance due to traffic growth in towns and cities (Environment Canterbury 2002b, p.10).*

**Box A3 Key results areas and targets.**

**1. Alternatives to the car**

*2011 targets:*

- 12% of all trips (excluding walking trips) made by cycle. (In 1996, 6% of total trips by car, cycle and public passenger transport were made by cycle.)
- 6% of all trips (excluding walk trips) made by public passenger transport. (In 1996, 3% of all trips made by car, cycle and public passenger transport were by public passenger transport.)

**2. Roads**

*2011 targets:*

- No congestion outside Christchurch City.
- No congestion within Christchurch City outside peak periods (7-9am and 4-6pm).
- The amount of congested road during peak periods is contained to 40 lane kilometres or less (1996 = 24, predicted 2011 = 78).
- CO<sub>2</sub> emissions are contained to within 15% of 2001 levels at 2011 (predicted growth to 2011 = 30%).
- Maintain or improve local air quality with respect to motor vehicle emissions.
- Reduce deaths from road crashes to six per 100,000 people or better.
- Reduce serious injuries from road crashes to 125 per 100,000 people or better.

**3. Demand management**

*2011 targets:*

- Reduce motor vehicle travel by an average of 10% by organisations or households where demand management programmes are applied.
- A reduction in the proportion of motor vehicles travelling during peak periods in greater Christchurch.

**4. Land use planning**

*2011 targets:*

- Reduce the distance of journey to work trips.
- Reduce average trip distances by mode.

**5. Freight**

*No targets*

However, environment is not listed as a separate key result area. It appears only within the "Roads: Infrastructure, safety and environment" result area as "Environmental effects". The policy, methods and major projects under "Environmental effects" are reproduced in Table A4. and Box A4.

**Table A4 Major projects relating to environmental effects.**

Major Projects for 2001 - 2006	Responsibility	By
Environmental monitoring and investigations of motor vehicle emissions	ECan, Transit NZ, CCC, Timaru DC	Ongoing
Install a network of stock truck effluent disposal sites	Transit NZ, Territorial Authorities, ECan	2003
Promotion and introduction of pollution-free technologies for public bodies to provide leadership by example	All government agencies	Ongoing
Enforcement of '10 second rule' for smoky vehicles	Police	Ongoing

**Box A4 Policies and methods relating to environmental effects.**

**Policy 2.4**

Ensure adverse environmental effects from transport are monitored and are reduced to levels that are equal or better than national and regional guidelines.

**Methods**

- 2.4.1 Adopt guidelines through planning processes and undertake monitoring and investigation programmes for transport related pollutants, including noise and vibration. [Responsibilities: ECan, Transit NZ, Territorial Authorities]
- 2.4.2 Implement traffic management measures that reduce pollutant levels in areas where these are close to or exceed environmental guidelines. [Responsibilities: Territorial Authorities, Transit NZ]
- 2.4.3 Encourage the development and utilisation of pollution-free technologies, including leadership by example by public bodies. [Responsibilities: All government agencies]
- 2.4.4 Advocate to Government for funding and pricing mechanisms that recognise environmental impacts and provide incentives for the avoidance or mitigation of negative environmental effects. [Responsibilities: ECan, Territorial Authorities]
- 2.4.5 Provide infrastructure to mitigate or avoid adverse environmental effects, such as noise buffers, treatment for water run-off and dump sites for stock effluent from trucks. [Responsibilities: Transit NZ, Territorial Authorities and with ECan where appropriate]
- 2.4.6 Enforce laws against vehicles that emit excess noise or smoke. [Responsibilities: Police]

**A8. Public submissions on the draft RLTS**

In late August 2001, after formal sign off by the RLTC, a draft RLTS was released for public submission. Media packs were sent to key media organisations in early September 2001, with print media advertising placed around the same time. Eight hundred draft RLTS documents were printed and distributed to organisations and individuals involved or

interested in the strategy and to public places such as libraries (Environment Canterbury 2004b, p.82).

A special edition of Environment Canterbury's *Living Here* newsletter was produced and delivered to all households in the Canterbury region during the week commencing 24 September 2001. This newsletter provided information on key parts of the draft strategy and included a freepost feedback form (ibid.).

Public consultation on the draft RLTS was also promoted via the Environment Canterbury web site from August to December 2001, with the option of electronic submissions. Only seven responses were received via the internet. Presentations on the draft strategy were undertaken on request. Presentations were given to various councils, community boards and organisations such as the Automobile Association and the Chartered Institute of Transport (ibid.).

Submissions on the draft RLTS closed in December 2001, with 50 written submissions received. Five hundred feedback forms were received, about 70% from the Christchurch area (which approximates the proportion of Canterbury's population resident in Christchurch). These were analysed based on yes/no "tick box" responses (for example, "Do you support the Vision?" Yes/No). Some submissions included additional comments. The results were summarised and provided to the RLTC for consideration (ibid.). A sub-committee of the RLTC was established to hear and consider submissions on the draft strategy. An officers' report reviewing submissions was prepared and presented to the subcommittee.

Submissions on the draft RLTS were generally positive and supportive of the vision and direction of the strategy. However, a number of changes were sought and eventually made, particularly in response to submissions from the Christchurch City Council and other district councils. A report was prepared itemising changes sought by submitters and identifying the nature and extent of changes made to the draft RLTS as a consequence (Environment Canterbury 2002a). Significant changes made at this stage were the:

- strengthening of the CO<sub>2</sub> emission target from the 'Roads' key result area,
- elimination of the two targets from the 'Land use planning' key result area and addition of a further demand management target.

Following deliberations, the subcommittee recommended a series of changes that were subsequently adopted by the RLTC in March 2002. Submitters were informed of the changes resulting from the hearings process. Environment Canterbury adopted the strategy on 28 March 2002 and it was published in June 2002.

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