

**Strategic Environmental
Assessment:
Application to Transport
Planning in New Zealand**

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Strategic Environmental Assessment: Application to Transport Planning in New Zealand

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Abbreviations

AEE	Assessment of environmental effects
EC	European Commission
EIA	Environmental impact assessment
EU	European Union
LTMA	Land Transport Management Act 2003
LTCCP	Long term council community plan
LTP	Land transport programme
MoT	Ministry of Transport
NLTP	National Land Transport Programme
NZTS	New Zealand Transport Strategy
OECD	Organisation for Economic Cooperation and Development
RLTC	Regional land transport committee
RLTS	Regional land transport strategy
RMA	Resource Management Act 1991
SA	Sustainability appraisal
SEA	Strategic environmental assessment
SOE	State of the environment
Transfund	Transfund New Zealand
Transit	Transit New Zealand
UNECE	United Nations Economic Commission for Europe

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Executive Summary

This report has been prepared to identify opportunities for the application of strategic environmental assessment (SEA) to transport planning in New Zealand. The research undertaken for the report was carried out between July 2003 and June 2004, as part of Transfund New Zealand's 2003/2004 Research Programme.

Strategic environmental assessment is widely used in transport policy development and planning in Europe and North America. SEA provides a systematic and transparent process for analysing and addressing the environmental and social impacts of proposed policies and plans. A distinctive feature of SEA is that it serves to focus attention on the environmental implications of decisions and highlights the importance of environmental sustainability.

The International Association of Impact Assessment 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.

Within the international literature, a wide range of examples of SEA application in the transport sector can now be found. These examples highlight the potential of SEA approaches to integrate the environment into mainstream policy and plan-making. They also underline the potential contribution of SEA to environmentally sustainable transport outcomes.

To date, experience of SEA in New Zealand has been limited. In general, environmental impact assessment has been restricted primarily to identifying the impacts of specific projects and, in particular, to assessments of environmental effects under the RMA. However, recent changes to New Zealand's transport policy and legislative framework provide the opportunity to develop a more systematic approach to SEA.

With the introduction of the New Zealand Transport Strategy (NZTS) and the Land Transport Management Act 2003 (LTMA), recognition of the environmental and social impacts associated with transport has been enhanced significantly. The NZTS has signalled a new policy direction for transport planning. Key objectives underpinning the NZTS include protecting and promoting public health and ensuring environmental sustainability. These objectives are also found in the LTMA.

From an SEA perspective, these changes are notable as they require consideration of sustainability at the policy level where transport strategies and programmes are being developed. Importantly, the provisions of the LTMA also incorporate a number of elements of effective SEA.

These are:

- A focus on sustainability;
- Requirements for early and full consideration of alternatives; and
- Requirements for early and full opportunities for public participation.

At the national level, there are opportunities to employ SEA approaches in the development of any national land transport strategy prepared by the Minister of Transport under the Land Transport Act 1998. While the preparation of the strategy is optional, SEA could provide a valuable means of informing its development. Opportunities also exist to employ SEA in the preparation of strategies being developed by the Ministry of Transport on specific aspects of land transport including freight, rail, cycling and walking.

At the regional level, SEA has the potential to make a significant contribution to the preparation of regional land transport strategies (RLTS). The LTMA has introduced specific requirements for RLTS to take into account how they contribute to environmental sustainability.

The research carried out for this report has identified the RLTS preparation process as a key entry point for SEA in New Zealand's transport planning framework. An examination of the current practice of preparing RLTS shows some similarities with SEA in the process steps employed. The new requirements of the LTMA provide a platform to build on and enhance instances of good practice.

To explore the potential to integrate SEA methods and techniques into RLTS development, further research is recommended. The key objectives of this research should be to:

- Identify cost effective and practical opportunities for SEA use in the regional land transport strategy preparation process.
- Assist regional councils to meet the new requirements of the Land Transport Management Act.
- Contribute to the delivery of the sustainability direction of the NZTS and the LTMA.

In exploring opportunities to adapt SEA approaches to New Zealand, a key point to emphasise is that SEA is context specific. The term "fit-for-purpose" is used to express the principle that SEA should be customised to the context and characteristics of policy and plan making.

The information and analysis set out in this research report should provide useful guidance for the design of any further research. More generally, it should also provide the transport policy community with options for adapting SEA to meet the requirements of the new policy and legislative environment.

Abstract

Strategic environmental assessment (SEA) is widely used in transport policy development and planning in Europe and North America. It is recognised as a valuable means of analysing and addressing the potential environmental and social impacts of transport policies and plans. In focusing attention on the environment, SEA also serves to highlight the importance of environmental sustainability in transport planning. To date, experience of SEA in New Zealand has been limited. However, recent changes to New Zealand's transport policy and legislative framework provide the opportunity to develop a more systematic approach to SEA. The introduction of the New Zealand Transport Strategy and the Land Transport Management Act 2003 has enhanced significantly recognition of the environmental and social impacts associated with transport. Importantly, the provisions of the Act also incorporate a number of elements of effective SEA. These include the Act's sustainability focus, its requirements for early and full consideration of alternatives and for early and full opportunities for public participation in land transport planning. The use of SEA approaches in the development of transport strategies and programmes could provide a valuable means of delivering on these obligations.

1. Introduction

1.1 Purpose of this report

This report has been prepared to identify opportunities for the application of strategic environmental assessment (SEA) to transport planning in New Zealand.

The key objectives of the report are to:

- Enhance knowledge and understanding of SEA within New Zealand's transport policy community.
- Identify opportunities for the use of SEA in transport policy development.
- Raise awareness of SEA approaches appropriate for use in response to new demands arising from the New Zealand Transport Strategy 2002 and the Land Transport Management Act 2003.

The research undertaken for the report was carried out between July 2003 and June 2004, as part of Transfund New Zealand's (Transfund's) 2003/2004 Research Programme.

1.2 Background to research

Strategic environmental assessment (SEA) is widely used in transport policy development and planning in Europe and North America. It is recognised as a valuable means of assisting decision makers to assess the potential environmental and social impacts of proposed transport policies and plans. Internationally, there are now a number of different forms of SEA, ranging from formal, legally prescribed procedures to more informal, flexible approaches.

In New Zealand, SEA is not formally applied to planning in transport or other sectors. Since 1991, environmental impact assessment in New Zealand has been restricted primarily to identifying the impacts of specific projects and, in particular, to assessments of environmental effects (AEEs) under the Resource Management Act 1991 (RMA). A limited form of assessment is also required under the RMA (section 32) when resource management policies and plans are being developed. However, in general, the development and use of tools to assess the environmental impact of policy and planning decisions has been limited.

This report has been prepared to assist in enhancing knowledge and understanding of SEA in New Zealand and to identify opportunities to apply SEA within the current transport policy and planning framework. By identifying improvements to existing approaches, the report also aims to contribute to the aim of the New Zealand Transport Strategy 2002 and the Land Transport Management Act 2003 to develop a sustainable land transport system.

1.3 Structure of report

The research carried out for this report has been organised as follows:

- Section 2 provides a general overview of the development of SEA internationally.
- Section 3 reviews overseas applications of SEA in the context of transport policy and planning, identifying approaches that could be used within the New Zealand transport environment.
- Section 4 outlines the current policy and legislative provisions for transport policy and planning in New Zealand.
- Section 5 examines New Zealand's existing transport policy and planning processes and identifies potential opportunities for integrating SEA approaches.
- Section 6 presents the report's conclusions and recommendations.

2. Understanding Strategic Environmental Assessment

2.1 Overview

This section provides an introduction to strategic environmental assessment (SEA), describing:

- Key trends and issues in the development of SEA.
- Institutional frameworks and processes established for SEA internationally.
- Examples of SEA implementation at the policy and planning level of decision making.

Some initial lessons of SEA good practice are also outlined by reference to internationally accepted aims, principles and procedures.

2.2 Defining SEA

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

The SEA process is designed to provide information for sound decision making, ensuring that environmental and related considerations are taken into account on a par with economic factors. It is widely accepted that SEA should be applied before decisions are made and when alternatives and options are still open to consideration.

Internationally, there is no single accepted definition of SEA. New definitions continue to be developed in the rapidly expanding SEA literature (Box 2.1). Some of the differences in emerging SEA definitions reflect the emphasis given to procedural characteristics. Others are more fundamental, concerning the role and scope of SEA, its relationship to social and economic appraisal and the extent to which SEA can or should provide an entry point to sustainability appraisal.

Sustainability appraisal can be described as the process of evaluating the economic, environmental and social impacts of proposed strategies and actions against an explicit set of sustainability principles and criteria (for example, as set out in national policy documents) to identify the dimensions of loss and change.

In this report, insights into the question “What is SEA?” are gained from SEA arrangements in place in various countries and international agencies. The administrative and legal arrangements identified provide for different forms of SEA, including what has been termed “para-SEA” (Sadler and Dalal-Clayton, 2003). A “para-SEA” process has the same function as SEA systems that are formally established by legislation or administrative order but only some of their features and characteristics. In such processes, SEA elements are either limited or are threaded seamlessly into the wider policy or planning framework.

This report recognises both formal and para-SEA approaches as having the potential to contribute to strategic planning within the New Zealand transport sector.

Box 2.1 Definitions of strategic environmental assessment

Definitions of SEA continue to emerge as the field expands. Early definitions conceived SEA largely as a tool to integrate environmental considerations into higher levels of development decision making (i.e., above the project level). More recent definitions, reflecting an international trend, promote a broader perspective on SEA as a means to integrate environmental and social (and potentially economic) considerations into the formulation of development policies, plans and programmes, or to test proposals against objectives, targets and strategies for sustainable development (Sadler, 1999, 2001).

Three different interpretations of SEA are given below. These examples illustrate the evolving interpretations of the SEA concept.

- SEA is a systematic process for evaluating the environmental consequences of proposed policy, plan or programme initiatives in order to ensure they are fully included and appropriately addressed at the earliest appropriate stage of decision making as a part with economic and social considerations (Sadler & Verbeem, 1996).
- SEA is a process directed at providing the authority responsible for policy development (the "proponent") (during policy formulation) and the decision-maker (at the point of policy approval) with a holistic understanding of the environmental and social implications of the policy proposal, expanding the focus well beyond the issues that were the original driving force for new policy (Brown & Thérèse, 2000).
- SEA is a tool for upstreaming environmental and social issues into development planning, decision making and implementation processes at the strategic level (World Bank, 2002).

2.3 Recent trends and developments in SEA

2.3.1 Status of SEA

The uptake and use of SEA internationally has increased rapidly in recent years and further changes are pending. In outline, the evolution of SEA can be organised into three main phases (Sadler, 2001):

- **The formative stage** (1970-1989) where legal and policy precedents for SEA were laid down but had limited application (largely in the USA).
- **The formalisation stage** (1990-2001) where different provisions for and forms of SEA were instituted by a number of countries and international agencies.
- **The expansion stage** (2001 onward) where international legal and policy developments promise to catalyse wider adoption and use of SEA, particularly in Europe.

Following the recent World Summit on Sustainable Development (WSSD), the potential of SEA to integrate environmental considerations into policies, plans and other high level proposals has gained increasing recognition. SEA is now being recognised as one of the

frontline policy tools that can help to deliver the “holistic, cross-sectoral” approach promoted in the WSSD *Plan of Implementation*.

At present, only a relatively small number of countries, mainly in Europe and North America, have systems for SEA in place. However, numbers are increasing with recent advances in the development of SEA. Accelerating this trend has been the introduction and subsequent implementation of the European Commission *SEA Directive (2001/42/EC)*. Increasingly, good practice policy-making is also following SEA approaches.

To date, SEA has been applied primarily to address major new initiatives in environmentally important sectors, such as energy and transport, and to spatial plans for multiple land use. With advances in the field, SEA is progressively being viewed as a “starting point” for sustainability appraisal of the economic, environmental and social impacts associated with a proposed policy, plan or programme.

However, many issues concerning the robustness and practicality of sustainability appraisal are unresolved, including long standing questions about how to effectively balance environmental protection with the economic and social components of sustainable development. While the practicalities of SEA in this latter context are still subject to debate and experimentation, the potential of SEA to bring a more structured and systematic procedure to policy and plan making in transport and in other sectors is widely recognised.

2.3.2 Current scope of SEA

At present, SEA systems are known to be in force in approximately 20 jurisdictions. These systems are relatively diverse and operate under different arrangements. Collectively, their scope of application encompasses policy, legislation, plans, programmes and other strategies across a range of different sectors.

Few, if any, countries have so far established SEA systems which are comprehensive in coverage. Of the systems in place, only a minority apply to the highest levels of decision making, typically defined by policy and legislation. The application of SEA to plans and programmes is more commonplace, with a particular focus on the energy, transport, waste and water sectors and on spatial or land use plans. At this level, the approach tends to follow that of environmental impact assessment (EIA) process and procedure.

The following table provides a summary of leading examples of institutional frameworks for SEA.

Table 2.1 Examples of institutional frameworks for SEA

Jurisdiction	Provision	Scope and relationship to decision making	Elements of process and procedure
Canada	Cabinet Directive 1990 (amended 1999).	Policy, plan and programme proposals submitted to Cabinet.	Flexible procedure, separate from project EIA.
Denmark	Prime Minister's Office circular (1993 amended 1995 and 1998 when requirement became legally binding).	Bills and other government proposals sent to Parliament or on which Parliament must be consulted.	Minimum procedure, separate from project EIA.
Netherlands	<i>Environmental Impact Assessment Decree</i> (1987, amended 1994).	Listed plans and programmes (strategic EIA).	EIA procedure applies in full.
	Cabinet Order (1995).	Draft regulations and (potentially) other policy intentions sent to Cabinet (known as the environmental test).	Minimum, separate procedure, linked to business and regulatory tests.
New Zealand	<i>Resource Management Act</i> (1991).	SEA elements provided by policy statements, regional and district plans, which govern resource consents.	No procedure, part of "effects-based" policy and plan-making.
United Kingdom	Guidance on Policy Appraisal and the Environment (1991 amended 1997).	Policies and programmes of central government agencies.	Flexible procedure, integrated with wider cost benefit appraisal.
	Planning and Guidance Note 12 (1992 amended 1998) to local authorities.	Development plans prepared under town and country planning regulations.	Qualitative procedure integrated with plan-making process.
USA	<i>National Environmental Policy Act</i> (NEPA 1969) and <i>Regulations</i> (1978).	All major actions but emphasis on programmes, grouped geographically, generically or by technology.	NEPA process applies with minor variations for draft bills.
European Community	Council Directive on the assessment of certain plans and programmes (2001/42/EC). Member states must be in compliance by 2004.	Specified plans and programmes (sector and spatial).	Framework law specifies minimum procedure to be followed by member states.
World Bank	Operational Directive on Environmental Assessment (EA) (OD 4.00, Annex A, 1989; amended as OD 4.01, 1991, becoming OP/BP/GP, 1999).	Bank financed plan, programme or series of projects for a particular sector or region.	Bank EA procedure applies to sector and regional programmes, not to policy-based lending/non-lending.

2.3.3 Comparison of EIA and SEA

Environmental impact assessment (EIA) is a long established procedure, typically applied to assess the environmental effects of specific projects. In New Zealand, EIA is employed largely in the context of assessments of environmental effects (AEEs) carried out under the RMA.

SEA is frequently compared to project-level EIA in order to draw out similarities and differences. One of the main features distinguishing SEA from EIA is the potential capability of SEA to address a range of alternatives at an early stage in their formulation, thereby highlighting the source of environmental effects rather than just treating the symptoms.

Other key differences in the timing, scope and emphasis of the two processes are outlined in the table below.

Table 2.2 Comparison of EIA and SEA

EIA of projects	SEA of policy, plans and programmes
Takes place at end of decision making cycle.	Takes place at earlier stages of decision making cycle.
Reactive approach to development proposal.	Pro-active approach to help development of proposals.
Identifies specific impacts on the environment.	Assesses (and can integrate) environmental, social and economic implications and issues of sustainable development.
Considers limited number of feasible alternatives.	Considers broad range of potential alternatives.
Limited review of cumulative effects.	Early warning of cumulative effects.
Emphasis on mitigating and minimising impacts.	Emphasis on meeting environmental, social and economic objectives and maintaining natural systems.
Narrower perspective, higher level of detail.	Broader perspective, lower level of detail to provide a vision and overall framework.
Well-defined process, clear beginning and end.	Multi-stage process, overlapping components, policy level is continuing and iterative.
Focuses on standard agenda, treats symptoms of environmental deterioration.	Focuses on sustainability agenda, gets at sources of environmental deterioration.
<i>Source: Adapted from CSIR (1996).</i>	

2.3.4 SEA arrangements

Legal and administrative frameworks established for SEA vary from country to country, far more so than in the case of EIA. These frameworks differ in their provision and application to policy, plans and programmes and in their coverage, requirements, procedure, methodology and relationship to decision making.

A basic distinction can be made between statutory and non-statutory frameworks. In statutory frameworks, provision for SEA is made typically in EIA-specific legislation or in a general environmental or resource management law. In non-statutory arrangements, SEA provision is made through administrative instruments, such as orders, directives or guidelines, which are generally considered to lack formal requirements and powers regarding compliance and enforcement.

The issue of whether SEA should be provided for in legislation is the subject of continuing debate. Within the debate, a particular distinction is made between plans and programmes on the one hand and policy on the other. The latter is seen by some as inherently unsuited to legal prescription and best suited to flexible, administrative instruments.

Recently, these matters have been brought into sharper focus with the precedent set by two international legal regimes, namely the European Commission *SEA Directive* (2001/42/EC) and the *SEA Protocol to the United Nations Economic Commission for Europe (UNECE) Convention on EIA in a Transboundary Context* (2003). Many requirements of the Directive and Protocol are the same or similar. This convergence is likely to promote a more standardised, EIA-derived approach to SEA of plans and programmes (Box 2.2). However, policy is omitted from the Directive and is discretionary in the Protocol.

Box 2.2	SEA Directive and SEA Protocol
	<p>The SEA Directive (2001/42/EC) applies to 15 member states and ten accession countries of the European Union. It is a framework law that all 25 states must transpose into legislation by 2004. The Directive is modelled very closely on the procedural requirements established in the earlier EIA Directive (85/311/EEC) and applies mainly to certain plans and programmes that set the framework for consent of projects subject to EIA. According to the SEA Directive, "environmental assessment means the preparation of an environmental statement". Key provisions relate to the information to be included, public involvement, review of alternatives and factors to be considered in decision making.</p>
	<p>The SEA Protocol to the UNECE Convention on Trans-boundary EIA (adopted in 2003) has been signed by 35 countries of the UNECE region, which encompasses Europe, North America and Central Asia. However, it does not come into legal force until ratified formally by more than 15 countries (expected to occur within the next 18 to 24 months). The SEA protocol mirrors the SEA Directive and has mandatory application to specified plans and programmes. Additionally, the SEA Protocol includes reference to policy and legislation, which signatories are encouraged to address on a discretionary basis. Some commentators see this as international "soft law" that over time may establish an obligation rather than an incentive. The SEA Protocol will also be open for signature by non-UNECE countries and, as such, may eventually become a global instrument.</p>

When considered together, both instruments are likely to have international implications for SEA procedure and practice, extending beyond the boundaries of the European Union and the UNECE region. Specifically, the SEA Directive and Protocol establish a legal framework against which other SEA systems may be compared and evaluated. However, this framework establishes a minimum set of procedural requirements, rather than principles and precepts of SEA "good practice". The Directive and Protocol should

therefore be set alongside the practical experience of other countries, which extends beyond an EIA-based approach and offers useful guidance on potential applications to New Zealand's transport sector.

2.4 SEA principles and lessons of good practice

The aims of SEA can be organised into three main categories, often called “top down”, “middle level” and “bottom up” strategies. These are respectively to:

- Promote environmentally and socially sustainable development.
- Integrate environmental considerations into all levels of strategic decision making.
- Strengthen the application of project-level EIA (Sadler, 2001).

A framework of SEA principles with application to the policy and planning levels of decision making has been proposed by several authors (Sadler and Verheem, 1996; Sadler and Brook, 1998; Sadler, 2001). Eight guiding principles have been formulated to offer indicative guidance on the appropriate scope, orientation and content for SEA process design and implementation. These principles are:

- *Fit-for-purpose* - the SEA process should be customised to the context and characteristics of policy and plan making.
- *Objectives-led* - the SEA process should be undertaken with reference to environmental goals and priorities.
- *Sustainability-driven* - the SEA process should identify how development options and proposals contribute to environmentally and socially sustainable development.
- *Comprehensive scope* - the SEA process should cover all levels and types of decision making likely to have significant environmental effects.
- *Decision-relevant* - the SEA process should provide sound information in a form appropriate to the level of decision making (e.g., statement of implications, issues and/or impacts).
- *Integrative* - the SEA process should include consideration of social, health and other effects, as necessary.
- *Participative* - the SEA process should provide an opportunity for public involvement, which is appropriate to the level and issues of decision making.
- *Cost-effective* - the SEA process should achieve its purpose in a timely and expeditious manner, including, as practicable, setting a context for project EIA.

SEA performance criteria, which elaborate on the above principles, have been prepared by the International Association for Impact Assessment (IAIA). These performance criteria are set out in Box 2.3.

Box 3.3 IAIA performance criteria for SEA

A good quality SEA process informs planners, decision-makers and the affected public on the sustainability of strategic decisions, facilitates the search for the best alternative and ensures a democratic decision-making process. A good quality SEA process is therefore:

Integrated

- Ensures an appropriate environmental assessment of all strategic decisions relevant to the achievement of sustainable development.
- Addresses the inter-relationships of biophysical, social and economic aspects.
- Tied to policies in relevant sectors and (trans-boundary) regions and, where appropriate, to project EIA and decision-making.

Sustainability-led

- Facilitates identification of development options and alternative proposals that are more sustainable.

Focused

- Provides sufficient, reliable and usable information for development planning and decision-making.
- Concentrates on key issues of sustainable development.
- Customised to the characteristics of the decision-making process.
- Cost and time effective.

Accountable

- The responsibility of the leading agencies for the strategic decision to be taken.
- Carried out with professionalism, rigour, fairness, impartiality and balance.
- Subject to independent checks and verifications.
- Documents and justifies how sustainability issues were taken into account in decision-making.

Participative

- Informs and involves interested and affected public and government bodies throughout the decision-making process.
- Explicitly addresses their inputs and concerns in documentation and decision-making.
- Has clear, easily understood information requirements and ensures sufficient access to all relevant information.

Iterative

- Ensures availability of the assessment results early enough to influence the decision-making process and inform future planning.
- Provides sufficient information on the actual impacts of implementing a strategic decision to judge whether this decision should be amended and to provide a basis for future decisions.

Source: IAIA, 2002, prepared by Bob Verheem in consultation with members of the SEA section.

The criteria build on the earlier EIA principles issued by IAIA and provide procedural guidance on what constitutes an effective or good quality process.

IAIA (2002) defines such a 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 EIA at the project level.

2.5 SEA procedure and methodology

2.5.1 SEA procedure

As outlined at the beginning of this section, SEA can be described as a formal, systematic process of analysis, which can be instituted within different policy and planning contexts.

A practical understanding of SEA procedures can be gained from the arrangements incorporated in the administrative and legal frameworks in place in certain countries and international agencies. These frameworks make provision for different forms of SEA, which fall broadly into three categories:

- *EIA-based* – the SEA process follows EIA procedure with many or all of the same steps and elements.
- *Appraisal-oriented* – the SEA process is less formalised, more qualitative, combining minimum or modified EIA procedures within a policy appraisal framework.
- *Integrated approach* – SEA elements are woven informally into the process of policy appraisal and development but are limited (or absent) as formal procedure. This level of integration should be differentiated from the integrated assessment of economic, environmental and social effects, which is a necessary but not sufficient basis for sustainability appraisal.

The first two approaches have both differences and similarities with respect to the steps and types of studies carried out. Table 2.3 illustrates EIA-based and appraisal-oriented approaches to the conduct of SEA. While certain stages and components correspond, there are differences in individual aspects. These include the emphasis on public involvement in the EIA-based approach and the use of cost-benefit analysis following the identification of environmental impacts in the policy appraisal approach.

Table 2.3 Comparison of appraisal-oriented and EIA-based approaches to SEA

Appraisal-oriented approach	EIA-based approach
<i>List the objectives of the proposal and summarise the policy issue, identifying constraints & trade-offs.</i>	<i>Screen to trigger SEA and identify likely scope of review needed.</i>
<i>Specify the range of options for achieving the objectives, including the “do nothing” option.</i>	<i>Scope to identify key issues and alternatives, clarify objectives and to develop terms of reference for SEA.</i>
<i>Identify and list all impacts on the environment and consider mitigation measures to offset them.</i>	<i>Compare alternatives including no action options to clarify implications and trade-offs.</i>
<i>Assess the significance of the impacts in relation to other costs and benefits.</i>	<i>Involve the public early, e.g., at the scoping stage and with sufficient information.</i>
<i>Value costs and benefits, including those based on monetary values, ranking or physical quantities.</i>	<i>Analyse impacts, evaluate alternatives, and identify mitigation and follow up measures.</i>
<i>State the preferred option with reasons for doing so.</i>	<i>Document the findings including recommended terms and conditions for implementation.</i>
<i>Monitor and evaluate the results, making appropriate arrangements for doing so as early as possible.</i>	<i>Review the quality of the SEA report to check the information is sufficient and relevant for decision making.</i>
	<i>Carry out follow up measures as necessary to monitor effects, check on implementation.</i>
<i>Source: UK Department of Environment, Transport and the Regions (1991, updated 1998)</i>	<i>Source: UNECE (1992)</i>

These comparisons are indicative only, since not all the steps described in the table will be utilised. In many cases, especially at the level of policy and legislative proposals, a minimal procedure will be followed where the SEA process is simplified into three steps of screening, scoping and report preparation. Other steps and activities will be introduced in moving from a flexible, minimal approach to a full stage, EIA-based procedure. Even in formally prescribed SEA processes, certain steps may be discretionary rather than mandatory (e.g., scoping under the EC *SEA Directive*).

2.5.2 SEA tools and methods

A wide range of methods can be used in SEA practice. These methods are derived from both EIA and policy appraisal (Table 2.4) and include tools that can be used for a preliminary assessment or as part of detailed impact studies. A preliminary SEA generally has three basic functions:

- Scanning and characterising the environment (e.g., baseline study).
- Scoping to identify key issues and formulate alternatives.
- Evaluating the potential effects of the alternatives against the objectives set.

A preliminary SEA can be completed quickly or provide the basis for a more detailed study of the environmental impact of implementing a preferred or best practicable environmental option. For example, for transport planning and other proposals with linear and spatial dimensions, vulnerability mapping can be used to identify the range of impacts and

conflicts (either using simple overlays or GIS-based analysis). Vulnerability mapping is the term used in Central and Eastern Europe to refer to the identification of environmentally sensitive areas, which road networks and routes should avoid or where special mitigation measures may be needed to address environmental effects.

Table 2.4 Assessment methods and their usage in SEA

Step	Examples of Methods
Baseline Study	<ul style="list-style-type: none"> • State of the Environment reports and similar documents • Environmental stock/setting • “Points of reference”
Screening/Scoping	<ul style="list-style-type: none"> • Formal/informal checklists • Survey, case comparison • Effects networks • Public or expert consultation
Formulating Options	<ul style="list-style-type: none"> • Environmental policy, standards, strategies • Prior commitments/precedents • Regional/local plans • Public values and preferences
Impact Analysis	<ul style="list-style-type: none"> • Scenario development • Risk assessment • Environmental indicators and criteria • Policy impact matrix • Predictive and simulation models • GIS, capacity/habitat analysis • Cost/benefit analysis and other economic valuation techniques • Multi-criteria analysis
Documentation for Decision Making	<ul style="list-style-type: none"> • Cross-impact matrices • Consistency analysis • Sensitivity analysis • Decision “trees”
<i>Source: Sadler and Verheem, 1996.</i>	

A number of the tools listed can also be used to undertake regional or area-wide assessment. This type of approach is being promoted by the World Bank to ensure its lending plans and programmes take account of implications for, or impacts on, critical resource assets or valued ecosystem components, such as wetlands, indigenous flora, rare or threatened species and their habitats.

In shifting the focus from plans and programmes to policy, the aggregate footprint of transport or other high-impact sectors can be estimated to gain longer term, larger scale perspectives (e.g., identifying the effects on and conflicts with environmental policy and management objectives). Scenario development can also be used to promote a more proactive approach to simulate sustainable transport futures and alternative ways and means of realising them.

Many of the tools identified in Table 2.4 are in use directly or in modified form in New Zealand already. Further reference to their application in the transport context can be found in section 5 of this report. However, it should be noted that some commentators consider current application to be weak (Dixon, 1994, 2002). Further consideration may therefore need to be given to how particular methods can be used more constructively. With this in mind, step-by-step guidance on SEA good practice in relation to transport policy and plan making is discussed in section 3.

2.6 Overview of SEA in New Zealand

As outlined in the introduction to this report, experience of SEA in New Zealand is limited. SEA is not formally applied to planning in transport or other sectors. However, some SEA-related functions and characteristics can be found in the Resource Management Act 1991 (RMA). While not designed as an SEA instrument, the RMA can be interpreted as providing a general, non-specific mandate for what has been termed “policy environmental assessment” (Bailey and Dixon, 1999), a form of SEA characterised as “threaded through the RMA” (Gow, 1998).

The Act provides for an integrated system of national and regional policy statements and regional and district plans that govern resource management and provide a framework for processing resource consent applications and conducting assessments of environmental effects (AEEs). In establishing an integrated framework for decision making, the RMA has a similar intent to SEA processes elsewhere.

While the RMA contains no formal, explicit requirement to undertake SEA, it places a strong emphasis on policy analysis. Section 32 of the RMA may be interpreted as an opportunity or soft-requirement for a form of SEA. This requirement is reinforced by section 35, which imposes a duty on local authorities to gather information, monitor and keep records as necessary to effectively fulfil their functions under the Act.

It is not yet clear whether or not a more systematic, SEA-related approach will evolve under the RMA. Generally, observers take a cautious view of the RMA’s potential as an SEA instrument, especially in comparison to the more formal SEA arrangements that are in place in other countries (Dixon 1994, 2002; Sadler, 1996, 2001; Ward et al., 2002). As Dixon has stated, much is dependent on the extent to which planners and decision makers take on board the principles of SEA in preparing policies and plans both under the Act and beyond its confines, applying them in the context of the Local Government Act 2002 and central government policies and strategies.

Arguably, the sustainability philosophy the Act embodies supports an SEA approach. In the context of the New Zealand transport sector, however, the RMA provides little incentive or legal scope to address questions commonly raised in other countries through formal SEA procedures.

This is demonstrated in the environmental impact assessment work for major roading projects undertaken by Transit New Zealand (Transit). For example, consideration of alternatives in the AEE typically relates to different alignments and/or construction methods rather than to different ways of meeting transport demand. However, in submissions to council hearings and the Environment Court, public interests commonly seek consideration of traffic management alternatives to roading, such as improved public transport. Their concern is for better consideration of environmental issues at a strategic or policy level (Young-Cooper, 2001).

Within the process of preparing regional land transport strategies, these issues may be addressed. As will be discussed in section 5, the procedural and content steps that Regional Land Transport Committees are required to follow in preparing strategies illustrate another style of SEA within or “threaded through” the planning process. It is within this process that the evaluation of economic, environmental and social aspects of different courses of action or types of investment may be found.

2.7 Summary

Over the last decade, considerable operational experience has been gained from SEA practice in different countries, at different levels and across a range of different sectors and areas. Based on this experience, a series of SEA “rules of thumb” can be distilled (Box 2.4). These rules of thumb serve as “reality checks” intended to demystify SEA and indicate that good practice in this field is consistent with good planning, that is, in accordance with the principles identified by professional bodies such as the New Zealand Planning Institute.

Box 2.4	SEA Rules of Thumb
Key rules of SEA good practice can be identified as follows:	
<ul style="list-style-type: none"> • Begin as early as practicable in the process of policy or plan formulation. • Keep in mind the purpose of SEA is to inform decisions not to produce a study. • Make sure the scope of SEA corresponds with the potential environmental effects of the proposal under review. • Focus on the comparison of major alternatives. • Look to gain environmental benefits as well as avoid adverse impacts. • Use the simplest procedures and methods consistent with the task. • Provide the right information, at the right time for decision making. • Follow through to implementation and evaluate outcomes. • Build professional capacity and strengthen process and procedure based on lessons of experience. 	

In the New Zealand transport setting, a key point to emphasise is that SEA is context specific. The term “fit-for-purpose” is used to express the principle that the SEA process should be customised to the context and characteristics of policy and plan making. Adaptation to the local context will be a critical basis for moving forward with the application of SEA.

As a means of progressing sustainability, SEA can be used proactively as a tool to build a greater measure of confidence in decision making that proposals under consideration are, at a minimum, within safe margins and consistent with the precautionary and polluter pays principles. Table 2.5 illustrates how key elements of existing SEA procedure might be adapted for this purpose on a “getting started” basis.

Table 2.5 Using SEA to test for sustainability appraisal

Stage of SEA	Sustainability test	Key questions
Screening	Direction toward requirements	Is the proposal consistent with sustainability policies? What are the environmental <i>implications</i> in this regard?
Scoping	Distance to target	How does the proposal measure up against key indicators? What are the significant environmental <i>issues</i> in this regard?
Significance	Determination of significance of impacts	What are the environmental <i>impacts</i> of the proposal? How significant are they with reference to sustainability policies and criteria?

3 International Experience of SEA in Transport Planning

3.1 Introduction

Internationally, there is considerable experience of SEA application in the transport sector, perhaps more than in any other single field. The environmental impacts of transport have been recognised for some time in environmental impact assessment (EIA) procedures. Major road development schemes, in particular, have been subject to EIA in numerous countries. In some countries, this approach is now complemented by SEA at the policy and planning level.

Interest in and demand for SEA has arisen from the convergence of trends in strategic transport planning and impact assessment. Strategic transport planning, focussing on sustainable development, is a relatively recent development although it has emerged from a much longer planning tradition. It is a current focus of international collaboration, particularly within the European Community, the United Nations Economic Commission for Europe (UNECE) and Organisation for Economic Cooperation and Development (OECD) member countries.

This section reviews recent trends in, and examples of, SEA application in transport policy and planning.

3.2 Overview of SEA in transport planning

Since the 1970s, the environmental externalities of transport have received growing attention in impact assessment. The introduction of EIA in the United States' National Environmental Policy Act 1969 was a major innovation in this respect. Subsequently, EIA procedures were introduced in Australia, Canada and the European Union.

For much of the period to 1990, in most countries EIA remained a relatively separate, stand-alone procedure. In the transport sector, transport studies continued to focus largely on economic aspects, demand forecasts and engineering issues of route planning and infrastructure design. Where EIA was employed, it was used primarily at the project level.

The limitations of project level EIA in addressing the full scope of transport impacts have been well documented (Dom, 1999). Many deficiencies can be traced to inadequate implementation of EIA procedures or a failure to apply guidance on good practice.

Other limitations are structural or inherent in the scope of EIA application at the project level, where the focus is uni-modal rather than multi-modal and large scale, cumulative and secondary impacts are difficult to comprehensively analyse without reference to the wider transport network and region. For example, early EIAs of proposed road schemes often addressed linear impacts on a section-by-section basis, rather than assessing the overall route and the location options.¹

¹ In much the same way as Transit New Zealand approached the Albany to Puhoi re-alignment north of Auckland.

To a much greater degree than EIA, SEA allows major alternatives to be considered and their environmental effects identified and compared. This capability is particularly important with respect to road transport schemes, which still predominate in the sector. SEA of transport policy and plan making is intended to address the environmental considerations of proposals and options at an early stage.

Over the last decade, there has been significant change in impact assessment approaches. Internationally, a more integrative, strategic approach to transport policy and planning has evolved, particularly but not only in Europe. Within the UNECE region, for example, considerable effort has been directed at developing conventions, norms and standards to integrate transport and the environment.

Recently, the environmental externalities of transport have been the subject of broader and more integrated policy frameworks and approaches. At the 1997 Regional Conference on Transport and the Environment, UNECE governments adopted the Vienna Declaration, committing to make transport environmentally sustainable. This aim can also be seen in the London Charter on Transport, Environment and Health, which calls for the World Health Organisation (WHO) and UNECE to work together to advance a common agenda.

Similarly, the *European Union Strategy for Sustainable Development* (2002) identifies the relationship of mobility, land use and territorial development as one of the main sustainability challenges facing all member states. It notes that current systems of transport are among the main factors shaping spatial development and have an increasing range of effects. It also notes that transport policy has generally responded to increasing demand by building new infrastructure, notably the extension and improvement of road networks and airport facilities.

This trend is associated with severe pollution and congestion throughout Europe, with transport now the fastest growing source of greenhouse gas emissions. While continued growth in traffic is expected, the *EU Strategy* states that this is not sustainable over the long term. Elsewhere in the *Strategy* a call is made for a new approach to policy-making to address the economic, environmental and social dimensions of sustainability. A White Paper is currently being prepared on a common transport policy.

In the United Kingdom (UK), Tomlinson (2001) and other commentators report an ever-widening scope of assessment (or appraisal in UK terminology) of transport schemes. Several White Papers on sustainable development have served to move the government away from the predominant “predict and provide” approach to transport policy. An agenda for integrated transport and land use planning is set out in the 1998 *White Paper on the Future of Transport* (Box 3.1), which calls for a more consistent approach to environmental appraisal.

The trend towards integrated appraisal is exemplified by multi-modal studies, which are used to assess the options for major transport corridors and national road plans in France, the UK and other countries. SEA and a related family of tools are being applied to promote sustainable transport options that meet economic, environmental and social criteria.

However, much still remains to be done in systematically accounting for the environmental impacts of transport.

Box 3.1 A New Approach to Transport Planning and Appraisal in the UK

The UK White Paper on Transport, *A New Deal for Trunk Roads in England* (1998), sets out a new policy framework for integrated transport planning and appraisal. It incorporates five main themes or objectives as follows:

- a) To protect and enhance the built and natural environment.
- b) To improve safety for all travellers.
- c) To contribute to an efficient economy and to sustainable economic growth in appropriate locations.
- d) To promote accessibility to everyday facilities for all, especially those without a car.
- e) To promote the integration of all forms of transport and land use planning, leading to a better, more efficient transport system.

Supporting these objectives, is a set of principles which require transport planning and appraisal to:

- a) Ensure transport costs reflect the wider costs of transport decisions for the economy and the environment.
- b) Enable people and business to take advantage of locations which meet their needs for access with less use of transport or less polluting means of transport.
- c) Appraise a wide diversity of measures to transport problems.
- d) Assess social exclusion and the distribution of the consequences of investment in transport.
- e) Consider health, social, economic and environmental issues on a consistent basis.
- f) Seek wider involvement of all stakeholders in the assessment process with clearer definition of objectives.
- g) Provide for greater transparency and openness in the assessment and decision making processes.

Source: Department of the Environment, Transport and the Regions, 1998.

3.3 SEA and the environmental impacts of transport

SEA of transport policy and plan making is intended to address the environmental considerations of proposals and options at an early stage. EIA of specific projects can then be tiered to the higher-level assessments, leading to a more streamlined and effective process that focuses on the important residual issues (typically related to the impacts of implementation of a proposal).

Such a comprehensive approach facilitates systematic and orderly coverage of the full range of impacts likely to accrue as a result of transport strategy and funding. Policy-level SEA can also be used to identify international commitments to the environment that need to be factored into transport strategies, plans and programmes.

The higher policy and plan level is also the stage at which early warning of global, regional and cumulative effects of a transport network can be best detected and addressed. Key issues and impacts related to the aggregate footprint of a transport system include those of

induced or secondary development, which may be as extensive as direct impacts in terms of urban sprawl, land disturbance or severance. In this context, there will also be flow-on effects in other policy sectors, notably related to energy consumption and the use of metals and non-fuel minerals in construction.

A broad-brush SEA of the environmental impacts imposed by a transport network will normally be wide ranging and include related social and community impacts. Some of these impacts will be general and more or less uniform across different transport systems, such as greenhouse gas emissions and associated climate change contributions. Others will be particular to geographic conditions and characteristics, such as regional air quality or habitat loss and implications for biodiversity.

This level of SEA will also consider modal and spatial alternatives for future development of the transport network with a view to identifying least impact or best practicable environmental options, including opportunities for demand management or use of other non-structural alternatives. In all cases, the assessment of effects of transport alternatives at the network level will be weighed against economic and social impacts, both positive and negative, to come up with preferred alternatives. The value of this approach is to make the environmental burden of a transport network explicit and indicate ways it may be reduced or managed, ideally pointing to creative trade-offs or win-win solutions.

Within this framework, project-specific EIA of transport schemes is still needed to address more localised effects. These will include both spatial and technical alternatives and mitigation of a range of effects associated with the construction and operational (traffic use) phases. In the construction phase, environmental attention would normally be directed to land take and severance, modification of watercourses and drainage patterns, habitat fragmentation and other types of ecological disruption.

Other construction or maintenance impacts include materials extraction, waste disposal and associated dust, noise, vibration, visual intrusion and nuisance concerns for nearby residents. These abiotic impacts will also feature in EIA of traffic use and impacts, together with air pollution, health and safety matters including those associated with transport of hazardous goods and materials.

In the case of “central place” transport schemes, notably new airports or seaports, controversial siting and land zoning issues often arise, including the relative concentration in a defined area of fuel, chemicals and other inflammable and toxic substances. The role and relationship of EIA and SEA becomes somewhat modified in this spatial context, compared to more typical, linear transport networks. A large scale EIA or area-wide or regional-scale environmental assessment is best suited to airport or seaport proposals, enabling consideration of connections with rail, road and other networks.

The French Ministry for Management of Land and Environment has published guidance on the larger scale environmental effects that are associated with transport at the strategic level, with reference to four environmental issues:

- safeguarding biodiversity,

- preservation of quiet zones,
- protection of surface waters and groundwater resources,
- protection of air quality.

Box 3.2 elaborates on these issues.

Box 3.2 Guidance on SEA of transport plans and programmes

Recent French guidance focuses on four larger scale environmental effects that are associated with transport at the strategic level:

Safeguarding Biodiversity: The fragmentation effect on ecosystems constitutes an important element of the adverse environmental impacts that infrastructure may have. The guidance proposes a method for measuring the effect of fragmentation that major infrastructure networks have on ecosystems. Key aspects of the evaluation process include:

- Identifying the main land-unit areas which are separated by the existing transport networks.
- Determining the proportion of land-unit areas showing a significant nature-conservation interest.
- Classifying the land-unit areas in relation to their nature conservation interest.
- Evaluating the induced land quality through the land-splitting effect of transport plans and programmes.

Preservation of Tranquil Zones: Noise is one of the most tangible and direct effects related to the use of transport infrastructure. Because noise levels depend upon local environmental and meteorological conditions as well as traffic levels, forecasting is much less straightforward at national or regional scales. A proposed methodology for this purpose is:

- Identify quiet zones, defined as areas where noise emissions from existing transport infrastructure are less than LAeq 6 am-10 pm = 45 dB(A).
- Map and classify quiet zones according to their importance.
- Assess the impacts of transport plans and programmes by overlaying networks and quiet areas.

Protection of Surface Water and Groundwater: Both the construction and use of transport infrastructure can affect water quality as a result of air pollution from exhaust emissions, fuel spills and pollutants associated with transport of hazardous materials. Indicators to identify the quality of surface water areas and the fragility of groundwater resources in the vicinity of new infrastructure are proposed but have yet to be tested.

Preservation of Air Quality: Concern with air quality relates to two major air pollutants:

- Nitrogen oxides (NO_x), produced by diesel-motor vehicles at much higher rates than petrol vehicles. Their contribution to ozone formation typifies global and local impacts of transportation on air quality.
- Carbon dioxide (CO₂), transportation is a major contributor to emissions of carbon dioxide, the most important greenhouse gas.

A third indicator, not directly related to pollutant emissions, is energy consumption. Reductions in fuel use slow down climate change, acidification and photochemical smog effects.

Source: Cited in *SEA Newsletter*, TRL, 2003.

3.4 Review of selected SEA practice in the transport sector

Three main levels of SEA application in the transport sector can be identified within the international literature:

- *Policy level SEA*, involving review of proposed transport directions and options at the highest level (e.g., guidelines, statements, position papers, legislation and strategies).
- *Sector plan and programme SEA*, involving review of a development or investment programme for transport infrastructure, maintenance or use including proposed actions to influence mobility or traffic patterns.
- *Spatial plan and regional SEA*, involving review of a transport strategy or scheme to establish or extend a network in a particular region or area, where the location of components and linkages is fixed allowing the effects on landscape, land use, habitat and other resources to be identified.

Examples of SEA at the policy and sector plan and programme levels are discussed below.

3.4.1 Policy-level SEA

Experience with SEA of transport at the highest policy level is relatively limited. However, a number of examples can be identified, both from EIA-derived approaches to SEA and from policy environmental appraisal as applied in the UK.

As discussed in section 2, EIA-derived approaches and policy appraisal have many of the same steps and actions. Important differences are the iterative and less procedurally distinct process that is followed in policy appraisal. These aspects can be seen in some of the examples described below (Sadler and Verheem, 1996, Dom, 1999, Fischer, 2002).

- *Environmental Appraisal of Fiscal and Physical Measures for Transport Policy-Planning*

In the early 1990s, the UK Department of Transport commissioned an analysis of public transport options for the environment. The objective was to estimate the urban-wide impact of fiscal and physical measures on road traffic and emission levels in cities of varying size and form. The appraisal was based on models of travel behaviour and traffic flows in participating cities, which were then used for policy testing in other cities with differing characteristics.

The analysis concluded that even extensive improvements in public transport, including the construction of new light rail lines, had a much smaller effect on emissions than policies that directly discouraged the use of cars (e.g., greater restrictions on parking, charging options). The study also suggested that city centre traffic restraint options would lead to a significant reduction in total trips to the city centre (a prognosis that was proven ten years later in the restrictions introduced in the City of London). Strictly defined, the environmental appraisal was a pre-policy study that clarified the relative environmental effects and advantages of a mix of fiscal and physical measures for transport planning (Department of the Environment, 1994).

- *Environmental appraisal of Transport Strategy for South East Scotland*
The Transport Strategy for South East Scotland established a set of policy objectives and principles to govern regional transport strategy. An environmental appraisal was commissioned by the Scottish Office to evaluate the strategy (which was road and rail focused) against environmental and transport objectives and in relation to UK-wide principles for sustainable development. The environmental appraisal of the strategy and its components provided a context for the development of infrastructure proposals, which were subject to project-level EIA. Further details can be found in Box 3.3, which describes the policy-oriented aspects.

Box 3.3 Environmental appraisal of *Setting Forth* – Scottish regional transport strategy

Background: *Setting Forth* was a transport strategy for South East Scotland centred on the Edinburgh metropolitan area. The policy/plan was subject to environmental appraisal. A six-stage approach was followed, corresponding with the Department of Environment’s good practice guidelines for environmental appraisal. Steps one and two involved the definition of policy objectives and principles and appraisal objectives.

Policy objectives and principles: In *Setting Forth*, the government established three key principles or objectives for transportation development, expressed as follows:

- Enhancing accessibility to and from Scotland north of the Forth must be a priority.
- Measures taken must improve the environment of Edinburgh by contributing to the role of public transport.
- Any new works must be environmentally acceptable.

Using these principles, "working" objectives were defined against which policy options could be appraised. Two additional requirements of government policy were added, namely that:

- Any new transport infrastructure should have a positive economic benefit to users.
- The policy should respect the principles of sustainable development as set out in the UK Sustainable Development Strategy and Agenda 21.

SEA focus: A series of appraisal objectives were defined, expressed in terms in which the performance of policy options could be measured. For example, environmental objectives included the following:

- To minimise emissions of carbon dioxide and other traffic related pollutants.
- To minimise loss of or damage to resources of importance to nature conservation, landscape and cultural values.
- To minimise impacts on local environmental quality for residents and others.

Most of the objectives were directional and were expressed in terms of maximising or minimising some effect, although some absolute targets were set. The appraisal exemplified an "objectives-led" approach that starts with a clear understanding of the purpose and principles of the proposal and translates these into "working" objectives against which options can be assessed and the implications of choices clarified.

These objectives were updated in *Travel Choices for Scotland 1998*, the Scottish Integrated Transport White Paper, and on this basis a number of multi-modal studies are being undertaken.

- *SEA of the Outline Plan for the European High Speed Train Network*

The Outline Plan for the European High Speed Train Network was issued in 1990 and covered the period to 2010. The proposed high-speed train (HST) network was European Union wide (then comprising 12 member states) and covered approximately 25,000 kilometres of new or upgraded lines. It was subject to SEA (or multi-modal appraisal) by the European Commission well in advance of formal procedures being in place in member states. Features of particular interest include the comparison of the environmental effects of the HST network with other modes of long distance transport (road, air and conventional rail) and the use of comparisons of “with” versus “without” scenarios (Box 3.4).

Box 3.4 SEA of the European High Speed Train Network

The European High Speed Train (HST) network responded to increasing transport demand and environmental problems of road and air transport in the European Union. An outline plan was drafted for 9800 kilometres (km) of new line (speeds to 300km per hour) and 14,400 km of upgraded line (speeds to +200km per hour). The proposal was subject to SEA.

SEA process: Four alternative scenarios for the outline plan were developed:

- Existing situation (as of 1988).
- Reference situation 1 (to 2010), assuming no further extension of the existing network with transport demand met by car, plane and conventional train.
- Reference situation 2 (to 2010), taking into account the extra mobility resulting from a fully developed HST network (as in the proposed outline plan).
- The proposed outline plan (preferred situation).

Environmental impacts and issues were broadly assessed to include: primary energy consumption, air pollution, noise pollution, spatial impact (i.e., land use, landscape sensitivity) and traffic safety. Methodologies used for this purpose included: GIS, traffic simulation modelling and expert judgement and extrapolation of known data. Both technological developments and national environmental policy objectives were taken into account. The study forecast that the HST network would change the modal split of intercity travel. A "with" versus "without" comparison indicated the HST network would reduce air pollution, lower energy consumption and improve safety (estimated against a roughly equivalent network of main roads and commercial flights).

Source: Sadler and Verheem, 1996.

- *SEA of the Second Transport Structure Plan for the Netherlands*

The Second Transport Structure Plan for the Netherlands consisted of two-tiers. The first had a strong policy orientation and focused on alternatives to organise transport in an energy-efficient manner. The SEA assessed the effects of these alternatives in terms of land take, air quality and other environment-related considerations. In doing so, it helped to set a framework for the second part of the structure plan, which comprised a programme of infrastructure projects that were assessed and compared in terms of their specific impact. This policy level approach was not followed in the Dutch National Traffic and Transport

Plan but it was evident in the transport-anchored spatial policy plan for the Delta metropolis, the urban heartland of the country (Box 3.5).

Box 3.5 SEA of the National Spatial Plan for the West of the Netherlands

The National Spatial Plan for the West of the Netherlands (2001) outlines policy options and possibilities for regional economic development based on new and improved transportation infrastructure. It was a Cabinet-level proposal to create a coherent, internationally competitive metropolitan area, comparable to London, Paris or Frankfurt. This aim was to be achieved by a new, high-speed railway system to reduce the travel time between the four major centres of the region (Amsterdam, the Hague, Rotterdam and Utrecht), integrating them into a super ring city or spatial hub of economic opportunities (called Delta metropolis). Key aspects of the plan were to identify the appropriate rail system for this purpose (conventional versus monorail) and the best areas to locate development (new housing and industry) in relation to the transport network and to protect the green “heart” of the region.

SEA Process: In this case, SEA was a voluntary rather than mandatory process. The purpose of the SEA was to identify the potential environmental, social and, in part, economic consequences and effects. The SEA process followed the formal Netherlands EIA procedure as far as time permitted, recognising that the decision making process was already at a relatively late stage and that certain exemptions would be necessary. Because of time pressures, the SEA process was organised into four main steps in relation to decision making:

Step 1 - draft options and “starting note” for SEA issued.

Step 2 - public participation and advice on the proposal and SEA content.

Step 3 - impact analysis and comparison of options for SEA (six-month period).

Step 4 - publication of draft decision and SEA report, which was released together with the Cabinet decision and included a review by the independent EIA Commission. In this case, the Commission’s advice was provided in a two-week turn around, although no provision was made for public review and comment on the report (an important component of formal EIA procedure).

Consideration of alternatives: Two basic planning models for the spatial structure of the Delta metropolis were presented:

- A “Ring” model in which only the major centres are connected by a high speed train and new housing and industrial areas are situated in proximity to the line.
- An “Inner ring” model in which the suburbs of the cities are connected by mono-rail (the shortest distance for the higher cost transport option) with new housing and industrial areas located within the green belts.

During the SEA process, three further variants of the planning models were identified:

- Ring model with alternative housing and industrial locations outside the green belt and core.
- Ring model with alternative housing and industrial locations proposed by local government.
- Inner ring model with alternative housing and industrial locations.

In accordance with Dutch spatial planning procedures, alternatives were analysed using three steps:

- First, design for the environment, the so-called “green-blue basis”, identified the network of protected natural and water areas (including archaeological and historical sites).
- Second, design of new infrastructure in relation to this network.
- Third, design for housing and industry in relation to “green-blue” and infrastructure networks, i.e., the elements that follow from land and resource use demands.

Since all models showed a large economic deficit, a new transport model was selected, consisting of a combination of three public transport systems: a high speed railway system between the major cities, a metro-system between medium sized cities and light rail and buses between small towns.

Source: Verheem, 2003.

3.4.2 Sector plan and programme SEA

In principle, SEA of transport policy alternatives should provide a framework or context under which SEA of transport plans and/or programmes are tiered. Elements of this approach can be seen in the cases described above. In practice, there are few examples of a systematic, tiered decision making hierarchy applied in transport or in any other sector. Despite this, there are an increasing number of SEA processes or equivalent multi-modal studies at the level of transport plans or programmes. This body of work is expected to increase rapidly in the near future when the *SEA Directive* comes into force in the 25 member states of the European Union.

Several member states already have experience with SEA in transport plans and programmes. Dutch, French, German and UK practice in this sector is particularly extensive. In addition, the World Bank is giving increasing emphasis to sector and regional assessment of lending and development programmes, many with a transport focus or component. Bank activities in this area are introducing SEA processes and elements in developing countries and regions. A few transitional countries already apply SEA processes or elements (e.g., Brazil, Chile, South Africa). Recently, China enacted a new EIA law that includes provision for SEA of plans and programmes in the transport sector.

The following examples are indicative of recent and current practice in SEA of transport plans and programmes.

- *SEA of the Federal Traffic Infrastructure Plan, Germany*

In Germany, Fischer (2001) reports that national and state level transport programmes are prepared in a structured and systematic manner that facilitates SEA application. The *Federal Traffic Infrastructure Plan* sets out the proposed development of national transport infrastructure for the period to 2012. It covers rail, trunk roads, waterways and air transport (i.e., transport responsibilities of the Federal Government). An SEA of the Plan was carried out to assess the effects of the different modes of transport on the environment. A similar approach is followed at the state level as shown by the case study in Box 3.6.

Box 3.6 **SEA of the Nordrhein-Westfalen Road Programme, Germany**

The German counties (Lander) prepare five year programmes for the extension of road networks (with the exclusion of national highways). Environmental objectives are an important component of the programmes. In the county of Nordrhein-Westfalen, an SEA was carried out for the road programme comprising routing and general design of 240 newly proposed regional roads.

SEA process: A three-step approach was followed to identify and analyse the effects of the road network extension on the environment. Route and design inputs were developed as follows:

- In step one, the sensitivity of the environment to road development was mapped with GIS (incorporating baseline data on residential areas, valuable habitat, water resources, landscape and amenity).
- In step two, the various sensitivity criteria were aggregated into an overall index and routes were optimised for passing through the least sensitive areas.
- In step three, the environmental impact of the optimised routes on high value areas and factories was estimated. Mitigation measures were proposed where environmental "bottlenecks" - or impact concentrations - occurred. Residual impacts after mitigation were classified for each section of the programme as "extraordinary", "above average", "average" and "small". Impact amelioration by mitigation measures was classified as high, medium and low.

While the SEA methodology used in the programme was criticised with regard to the baseline data and aggregation method used, the environmental quality of the resulting proposals was improved by use of SEA. New road projects will be subject to EIA tiered to the programme SEA.

Source: DHV Environment and Infrastructure, 1996.

- *South West Area Multi-Modal Study (SWARMMS), UK*

SWARMMS was one of a series of major transport studies commissioned by the UK government in order to plan for the future of transport in England. The studies examined current and projected transport issues and the potential solutions to address them.

Completed in 2002, SWARMMS was the largest of these studies. The aim of the study was to make recommendations on a long-term strategy for addressing passenger and freight transport demands within key transport corridors from London to the south west of England (M4/M5/A303/A30/A38 trunk roads and the parallel rail routes). It was subject to an SEA-type process as part of an integrated approach that examined traffic, economic and safety aspects (Box 3.8).

Box 3.8

South West Area Multi-Modal Study (SWARMMS), UK

SWARMMS was the largest of a series of multi-modal transport studies conducted in the UK from 2000 to 2002. The study provides an illustration of a strategic transport appraisal for a large and environmentally complex area (24,000 square kilometres encompassing two national parks, twelve areas of outstanding natural beauty and 638 kilometres of designated heritage coast). It incorporates an SEA-type process as part of an integrated approach examining traffic, economic and safety elements.

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3.5 Toward SEA good practice

From an examination of existing theory and practice, Sadler has developed step-by-step guidance on the application and use of SEA procedures and methods. Key steps are summarised in Table 3.1. It should be stressed that many of the steps identified may not necessarily be part of the formal SEA process at all levels. For example, in some SEA systems, at the policy level a simplified, minimum procedure is followed. Alternatively, policy appraisal may include a greater number of steps that are integrated into the decision making process rather than addressed separately.

Table 3.1 Step-by-step guidance on application and use of procedures and methods in SEA good practice

<p style="text-align: center;">1</p> <p style="text-align: center;">Proposal</p> <p>Establish the need for and objectives of the proposed action.</p>	<p>Before SEA is initiated, the responsible agency defines the basis for a proposed policy, bill, plan or programme. A preliminary statement should be made of the need, purpose and objectives to be achieved. These aims are not subject to review by an SEA, but the justification of a proposal is conditional on its environmental impact. The SEA process itself must be objectives-led in order to fully evaluate the environmental impacts of a proposal. Preparatory methods of identifying environmental objectives include policy and legal review (e.g. goals, standards and targets outlined in government strategies, obligations under international environmental agreements).</p>
<p style="text-align: center;">2</p> <p style="text-align: center;">Screening</p> <p>Determine if a SEA is required and at what level of detail.</p>	<p>Formal screening procedures can be divided into two types. Listed proposals subject to SEA are specified in legislation or guidelines. Case-by-case screening applies to all proposals to determine which ones have potentially significant environmental effects and warrant full assessment. Screening criteria and checklists from EIA can be readily adapted for this purpose and supplemented as necessary by policy tree diagrams and stakeholder consultation. Use of these methods also helps to indicate the type of approach and level of detail required for a SEA (e.g., policy appraisal versus impact assessment). For certain proposals, timing and tiering are important considerations in SEA screening decisions (e.g., at which level is SEA best carried out, how to relate it to any successive SEA and/or EIA process).</p>
<p style="text-align: center;">3</p> <p style="text-align: center;">Scoping</p> <p>Identify the important issues and impacts that need to be examined.</p>	<p>EIA scoping procedures can be adapted to different types of proposal subject to SEA. An early, transparent and systematic process should be followed to focus on the impacts that matter for decision making and set terms of reference for further study. Modified EIA methods, such as matrices, overlays, and case comparisons can be used to scope the environmental dimensions of specific plans and programmes (e.g., to identify inconsistencies in objectives, issues that require attention and/or the potential impact of implementing the proposal). Where environmental considerations are generalised and less immediate (e.g., proposed immigration, fiscal or trade policies), appraisal methods can be used, such as environmental scanning to clarify the implications and/or issues tracking to a stage when key impacts become clarified (e.g., immigration projections linked to housing demand, nationally or regionally).</p>

<p style="text-align: center;">4</p> <p>Information</p> <p>Assemble environmental information.</p>	<p>The general content of information to be gathered in a SEA can be specified in legislation or procedure. The data that needs to be gathered for a specific proposal will be clarified during screening and scoping. SEA is carried out against a baseline or profile, typically a description or characterisation of the affected environment or media (e.g. air or water quality). Useful sources of background information include state of the environment reports and country environmental profiles. For plans and programmes with a spatial dimension, the baseline can be recorded as environmental stock and critical natural assets. Key indicators are used to measure change in terms of global sustainability, natural resource management and local environmental quality. Appropriate indicators for sector-specific proposals will depend on the key environmental impacts (e.g., emissions-based air quality indicators for energy, transport strategies).</p>
<p style="text-align: center;">5</p> <p>Consideration of alternatives</p> <p>Identify and compare the range of alternatives, including a best practicable environmental option (BPEO).</p>	<p>Formulation of alternatives in the SEA process is central to integrating environment considerations into policy and plan-making. A first step is to identify the range of alternatives that meet the objectives of the proposal and summarise their economic, environmental and social aspects. The alternatives should include a “do nothing” alternative and best practicable environmental option (BPEO). Where a large number of alternatives are open, methods used to systematically compare them include environmental benefit-cost analysis and multi-criteria evaluation. The BPEO helps clarify the environmental trade-offs that are at stake and the basis for choice. Objectives-led SEA is critical for this purpose and also can empower risk and benefit negotiation (e.g., to reduce NO_x emissions as part of a transport strategy).</p>
<p style="text-align: center;">6</p> <p>Mitigation</p> <p>Identify measures to avoid, reduce and offset the main impacts identified.</p>	<p>The EIA mitigation hierarchy should be followed in SEA. The mitigation hierarchy requires avoidance then reduction, followed by offsetting adverse impacts, using appropriate measures and actions. A precautionary approach should be taken when information is incomplete but analysis indicates the risk or possibility of large scale, serious or irreversible environmental change. This may entail rejecting certain proposals or replacing them with “no regrets” alternatives. For low-threat situations, standard mitigation measures can be used to minimise an impact to “as low as reasonably practicable” (e.g., using “best available technology not entailing excessive cost” or contingency policies and plans to cope with low probability but highly damaging risks).</p>

<p style="text-align: center;">7</p> <p style="text-align: center;">Reporting</p> <p>Describe the environmental impacts of the proposal and how they are to be addressed.</p>	<p>Typically, a separate SEA report or statement must be prepared and made available to the public. Other than certain prescribed information content, there is no common format. Depending on the context, a report can be an environmental paragraph in a policy memorandum, a section or chapter in a plan or strategy, or a separate document or annex ranging from a few to several hundred pages. The proposal itself should contain or be accompanied by a brief explanation of the SEA process and a summary of findings (e.g., key impacts, preferred alternative, mitigation measures and outstanding issues). Use of impact display and trade-off matrices help to focus decision making. Changes already made to a proposal as a result of an SEA should be noted on a policy record sheet.</p>
<p style="text-align: center;">8</p> <p style="text-align: center;">Review of quality</p> <p>Check the information is adequate for purposes of decision making.</p>	<p>An SEA report should be reviewed to ensure it provides the information necessary for decision making, prior to its submission. Review procedures can be informal or formal, internal or external, conducted by the competent authority, environment agency or an independent body. Provision for public comment on a SEA report, although not uniform, promotes transparency and robustness. As in EIA, review of quality takes place against terms of reference or other guidance issued for SEA preparation. But the scope of review can differ markedly with the type of proposal and policy context. Use of methods can range from spot checks to comprehensive quality audit.</p>
<p style="text-align: center;">9</p> <p style="text-align: center;">Decision making</p> <p>Approve, reject or modify the proposal, with reasons for decision.</p>	<p>On submission to the final decision making body, a proposal can be approved, rejected or modified (e.g., as a result of condition-setting). When doing so, the decision making body has a duty or obligation to take account of the results of an SEA, including public consultation. Reasons for the decision should be issued, specifying the terms of approval and any follow up requirements.</p>
<p style="text-align: center;">10</p> <p style="text-align: center;">Monitoring</p> <p>Check to see implementation is environmentally sound and in accordance with approvals.</p>	<p>Monitoring implementation of a policy, bill or plan can be a simple check to see if environmental objectives are being met, or a systematic programme to measure impact. Information tracking systems can be used to monitor issues and progress and to focus and streamline any subsequent SEA or EIA process. Cumulative effects monitoring may be appropriate for plans and programmes that will initiate regional-scale change in environmental stock or critical natural assets. Methods and indicators for this purpose are not well developed.</p>
<p><i>Source: Sadler, 2001.</i></p>	

3.5.1 Key elements of SEA practice

Many of the steps and activities undertaken in multi-modal transport studies, such as SWARMMS, are similar to those identified above. Key elements common to both processes are summarised below.

- *Information requirements*
At the level of multi-modal transport plans and programmes, SEA requires considerable information on the environmental characteristics of the area or setting. Existing and readily available data sources (e.g., GIS, state of the environment reports, habitat protection, flood risk maps) can be supplemented by reconnaissance surveys and network overlays. Generally, a SEA of a transport plan or programme will not require the site-specific detailed information or field surveys that are typical of an EIA at the project level. However, certain modelling studies of air quality and noise impacts can be data demanding.
- *Identification and consideration of alternatives*
Typically, a range of alternative transport measures will meet plan or programme objectives. Depending on the level or stage of the transport scheme, these may be extreme alternatives or feasible alternatives. For example, in the case of the UK M4 Common Appraisal Framework, three basic strategies were developed as extreme options in order to discern the extent to which each could by itself contribute to the solution of transport problems.

The options comprised road building, enhanced public transport and traffic demand management strategies. Each strategy employed a mix of infrastructure and policy measures including land use, urban car parking and road pricing actions. The measures were identified through discussions with those responsible for the provision of transport infrastructure and services as well as major users of the networks. In SEA processes, the identification of alternatives would be made during scoping and, ideally, would involve wider public consultation.

- *Selection of issues and indicators*
When assessing transport measures involving different modes, it is necessary to develop objectives and indicators that address the likely environmental impacts. In SEA and multi-modal studies, technical specialists often undertake this task with little involvement in the definition or validation of objectives and indicators by other groups.

At a minimum, however, it is important that these criteria are related to the requirements of decision making. Generally, indicators are selected on the basis of minimising the need for external data assembly and to ensure that all relevant topics are addressed. It is also important to avoid bias across different modes of transport or geographic areas. Table 3.2 illustrates the approach taken in the M4 Common Appraisal Framework.

- *Impact analysis*

Typically, SEA guidance is procedural rather than methodological, although there is a growing body of experience with impact analysis. Depending on the type and level of the transport strategy, the orientation may be toward impact identification (e.g. policy level) or impact prediction (e.g. road network extension plans). The methods available for impact identification and prediction can be found in Boxes 3.10 and 3.11.

Many of the methods used in SEA of transport plans are relatively simple and, in some cases, rapidly applied (e.g., checklists, matrices). For example, certain impact identification tools are suited to the policy level (e.g., transport scenarios) or to plans covering a particular area or having a strong spatial component (e.g., overlays).

Vulnerability mapping can be used at a number of scales of resolution including national transport plans. For multi-modal, integrative transport programmes, environmental benefit cost analysis and multi-criteria analysis are used to compare and rank effects. Key stages in multi-modal studies include:

- Defining geographic and time boundaries for the study.
- Establishing environmental as well as transport objectives.
- Identifying potential effects of transport alternatives and measures.
- Identifying appropriate environmental and other indicators.
- Defining baseline conditions.
- Forecasting effects of transport strategies.
- Appraising relative performance of each transport strategy.
- Identifying the preferred strategy.

- *Reporting*

Except in a general way, there does not appear to be a common format for multi-modal study reports in the manner that will apply once the European *SEA Directive* comes into force. Its formal reporting requirements are detailed below, since they also summarise minimum requirements for good SEA practice:

- An outline of the contents, main objectives of the plan or programme and relationship with other relevant plans and programmes.
- The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme.
- The environmental characteristics of areas likely to be significantly affected.
- Any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of particular environmental importance.
- The environmental protection objectives, established at international, Community or Member State level, which are relevant to the plan or programme and the way those objectives and any environmental considerations have been taken into account during its preparation.

- The likely significant effects on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage, landscape and the interrelationship between the above factors.
- The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programme.
- An outline of the reasons for selecting the alternatives dealt with and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information.
- A description of the measures envisaged concerning monitoring.
- A non-technical summary of the information provided under the above headings.

Table 3.2 M4 common appraisal framework objectives and indicators

Issue	Objective	Strategic Indicator	Data Source
ENVIRONMENT			
Noise and vibration	Traffic noise levels in the vicinity of transportation infrastructure are minimised (EO1).	Length of main transportation network with a change in noise levels.	Transport model
Air quality	Total greenhouse gas emissions from transport are minimised (EO2).	Change in CO ₂ emissions in the regional transportation model area.	Transport model
	Any increase in the acidification loading due to transport is minimised (EO3).	Change in NO _x emissions in the regional transportation model area.	Transport model
	Emissions from transport affecting local air quality are minimised (EO4).	Percentage change in total emissions of NO _x within Newport.	Transport model
Landscape/townscape	Minimise adverse change in designated or historic landscapes (EO5).	Area of transportation infrastructure affecting designated or historic landscapes.	Land use plans, assumed format of transport measures, reconnaissance surveys
Biodiversity/nature conservation	Minimise any adverse effects on the integrity of designated sites of national importance (EO6).	* Area of transportation infrastructure affecting designated sites. * Extent of direct or indirect risk to designated sites.	Land use plans, assumed format of transport measures, reconnaissance surveys
	Minimise adverse effects upon locally designated sites of irreplaceable value (EO7).	* Area of sites of local ecological value directly or indirectly affected.	Land use plans, assumed format of transport measures, reconnaissance surveys
Cultural heritage	Minimise adverse affects on the integrity of nationally designated sites of cultural heritage (EO8).	Number of scheduled ancient monuments or conservation areas experiencing a change in their setting.	Land use plans and local records
Water resources	Minimise any increase in the susceptibility of land use activities to flood risks (EO9).	Area of floodplain occupied by new transportation infrastructure.	Land use plans, assumed format of transport measures
ACCESSIBILITY			
Community severance	To reduce community severance or conflict between motorised and non-motorised travellers (EO11).	Length of transportation infrastructure with a change in severance.	Land use plans, assumed format of transport measures, reconnaissance surveys
INTEGRATION			
Land use, plans and policies	Minimise the need for property demolition or land take (EO12).	Potential for property to be demolished or relocated.	Land use plans, assumed format of transport measures, reconnaissance surveys.

Issue	Objective	Strategic Indicator	Data Source
	Maximise support to transportation, land use planning, environmental sustainability and health policies (EO13).	Extent to which plans and policies are assisted or hindered.	Government policy documents and local policy documents.
Resource use	Minimise the amount of energy consumed by the transportation network (EO14).	Change in the consumption of energy within the regional transportation network.	Transport model.
Construction	To minimise risk of extensive construction disturbance to sensitive features (EO15).	Area of major construction works within 100 metres of properties or designated sites.	Land use plans, assumed format of transport measures, reconnaissance surveys.
<p>Note: Transportation infrastructure includes all transport related works having a discernible physical presence and applies to cycle routes, bus routes, pedestrian facilities and traffic management measures as well as roads and railways.</p>			

Box 3.10 **Some Methods for Impact Identification**

Literature search

- **State of knowledge** - a survey to identify linkages between policy actions and environmental impacts. State of the environment reports and environmental policy plans are useful documents to start with.
- **Case comparison** - comparison of examples from other policy domains or jurisdictions. Analysis of similar actions in other countries can provide insight into the possible impacts of policy options.

Expert judgement

- **Delphi survey** - an iterative canvass of opinions and perspectives from recognised experts in pertinent fields.
- **Workshops** - structured meetings with a problem-solving focus, e.g., to develop alternatives or map possible impacts.

Analytical techniques

- **Scenario development** - projections, based on reasoned assumptions, to outline and compare the means by which, or conditions under which, a proposed action may be implemented, e.g., best versus worst case scenario of risks and impacts.
- **Model mapping** - identification of cause-effect networks to qualitatively illustrate linkages, e.g., policies will influence plans and programmes, which will subsequently initiate projects.
- **Checklists** - checklists developed for project EIA have proven useful at the strategic level, in original or modified form.
- **Indicators** - sometimes it will not be appropriate, possible or necessary to predict all environmental impacts of a proposed policy. Instead, screening against relevant indicators may be sufficient for the purposes of an SEA. In many cases, indicators can be used to establish networks focusing on emissions and paths rather than actual effects on flora and fauna. Because indicators, by definition, need little aggregation, this may reduce the workload considerably. Note, however, the possible distortion that may occur in the simplification process implied by aggregating environmental variables into one single indicator.

Consultative tools

- **Interviews** - interviews with experts, opinion leaders, political representatives.
- **Selective consultation** - with key interest groups and/or communities and sectors directly affected by a proposed policy, plan or programme.
- **Policy dialogue** - round table or other multi-stakeholder process to clarify issues, determine consequences and identify options that meet the concerns and interests represented.

Source: Sadler and Verheem, 1996.

Box 3.12 Some Methods for Impact Analysis

Extended use of identification methods

In most SEAs, relatively simple and straightforward methods will be sufficient. Examples include literature searches, case comparisons, expert judgement, scenario development and model mapping. This last technique is reported to have been effective for SEA. Often, it has proven possible to sufficiently quantify environmental indicators by filling in each parameter of an impact network, based on data from literature, indicative calculations or expert judgement.

Use of matrices

Grid diagrams can be used to cross-reference a list of (sub)actions to a list of environmental impact parameters. Most SEAs make use of matrices in some form. The UK *Guide on SEA for Structure Plans* recommends matrices as the main tool, including for use in consistency analysis to identify potential conflicts between objectives in different policy sectors.

Computer modelling

In some countries, computer models are used to calculate the impact of strategic options on environmental indicators. For example, these have been applied to habitat supply analysis in Canada and the US and to simulate the impact of tax policy on energy use, vehicle mileage and use of public transport in the UK.

Geographic Information Systems (GIS)

GIS are especially useful in land use planning, routing studies and assessing cumulative impacts of several projects in the same area. They may also be used to support impact analysis, e.g., calculation of land occupation or measuring environmental impacts as a function of distance to pollution sources.

Cost effectiveness analysis

Used to select the option that achieves a target or goal at least cost (environmental or financial), 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, emission limits or resource harvesting allocations).

Cost-benefit analysis (CBA)

CBA is a technique in which as many impacts as possible are expressed in a unified value. The cost-benefit ratio is a basis for choice between the options reviewed.

Multi-criteria analysis (MCA)

MCA is 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). Using mathematical operations, combinations of weights and criteria scores provide a ranking of options. The advantage of MCA over CBA is that it allows for the joint analysis of both environmental costs and financial costs, even when the environmental costs cannot be valued in monetary terms. MCA does not necessarily lead to one, unambiguous solution. It generally leaves some freedom to decision makers. A specific form of MCA is the "goals achievement matrix" which helps identify how an action may potentially contribute to a set of specified (environmental) objectives.

Aggregation methods

Used to translate "groups of indicators" into a single composite indicator, aggregation methods aim to make the total amount of 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. Usually, however, some aggregation is needed and possible without generating controversy. Some methods are:

- Index methods: aggregation by valuation and weighted summation.
- Monetary methods: all impacts are translated into one unit.
- Source methods: aggregation on an impact basis, for example, energy sources according to their contribution to the emission of CO₂, air pollution sources according to their contribution to acidification.

Life Cycle Analysis (LCA)

LCA is a standardised method taking into account the total life cycle of goods or services from the use of natural resources, to production to the treatment of waste. A standardised method is scored on ten environmental issues: human toxicity, aquatic ecotoxicity, soil ecotoxicity, greenhouse effect, ozone production, acidification, eutrophication, smell, use of space and use of natural resources. Scores are weighed against existing environmental problems.

Source: Sadler and Verheem, 1996.

3.6 Summary

In terms of international experience, there is now a large body of work on SEA in the transport sector. This experience underlines the potential value of this approach in integrating the environment into the mainstream of policy and plan-making and in achieving a “big picture”, network-wide perspective on the full range of impacts associated with transport schemes and options. It also underlines the opportunities for making transport more environmentally sustainable.

The levels of SEA application to transport proposals described in this chapter began with policy level SEA, where experience is still limited but some examples can be drawn together, such as SEA of the policy tier of the Second Transport Structure Plan for the Netherlands.

At the level of transport plans and programmes, comparatively more examples of recent SEA practice can be found. Every indication is that these will increase significantly in coming years with the entry into force of the EC *SEA Directive* which makes specific reference to plans and programmes in the transport sector.

The examples provided in this chapter are indicative of approaches and methodologies that may be applied in New Zealand rather than models for adoption. As emphasised in the previous section of this report, SEA must be adapted to context and designed to be “fit for purpose”. The generic elements and step-by-step guidance on SEA good practice outlined in this section provide a useful aid for exploring opportunities in New Zealand’s transport policy and planning framework.

In some instances, it may not always be clear where SEA processes or elements end and those of good planning begin, particularly if an integrated approach is adopted. The key distinction of SEA is the contribution it can make to planning and strategy development by taking into account the environmental effects of proposed options and measures and relating these to sustainability.

4. New Zealand Transport Policy and Planning

4.1 Overview

Recent changes to New Zealand's transport policy and legislative framework have enhanced the recognition of environmental sustainability in transport planning. Both the New Zealand Transport Strategy and the Land Transport Management Act 2003 incorporate the concept of sustainability and provide specific recognition of the need to address the environmental and social impacts of transport.

From an SEA perspective, these changes are notable as they require consideration of sustainability at the policy level where transport strategies and programmes are being developed. This section provides an overview of the legislative and policy provisions relevant to SEA in New Zealand's transport planning framework. The section begins by outlining the provisions of the New Zealand Transport Strategy. It then identifies relevant provisions contained within the Land Transport Management Act.

4.2 The Policy Framework

4.2.1 New Zealand Transport Strategy

The New Zealand Transport Strategy (NZTS) was released by the Labour-Progressive Government in December 2002. The strategy establishes a "vision" for New Zealand's transport system and sets five objectives to support it. The vision is stated as follows:

By 2010 New Zealand will have an affordable, integrated, safe, responsive and sustainable transport system (New Zealand Transport Strategy, p2).

The five objectives supporting the vision express desired economic, environmental and social outcomes. The objectives are stated as:

- Assisting economic development,
- Assisting safety and personal security,
- Improving access and mobility,
- Protecting and promoting public health,
- Ensuring environmental sustainability.

The approach taken in the NZTS is to describe broad policy directions, rather than set specific targets or priorities for action. For example, in achieving the objective of ensuring environmental sustainability, the strategy identifies two broad approaches as follows:

- The transport system will have to reduce its negative impacts on land, air, water, communities and ecosystems.
- The transport system will have to make more efficient use of its resources, reduce its use of non-renewable resources and shift over time from non-renewable to renewable resources (New Zealand Transport Strategy, p43).

While the strategy lacks a defined set of actions, it does identify connections to other government programmes and strategies relevant to transport. Within the NZTS, connections are drawn to a number of programmes and strategies with implications for transport policy development including the National Energy Efficiency and Conservation Strategy, the New Zealand Biodiversity Strategy and the New Zealand Health Strategy.

Viewed collectively, these strategies assist to draw attention to the wider environmental and social impacts of transport and provide some guidance on the issues that need to be addressed in achieving the NZTS vision. The key strategies identified in the NZTS are summarised in Table 4.1.

Like the NZTS, some of the identified strategies establish broad policy directions rather than define action plans. However, the framework created by the strategies assists to highlight the need for policy integration across sectors, an important component of SEA. The framework also serves to focus attention on the economic, environmental and social aspects of policy development in the transport sector.

Table 4.1 Key government strategies and programmes identified in the NZTS.

<p>National Energy Efficiency and Conservation Strategy</p> <p>The purpose of the National Energy Efficiency and Conservation Strategy (NEECS) is to promote energy efficiency, energy conservation and renewable energy. The strategy contains a specific action plan setting out three objectives relating to transport. These objectives are to:</p> <ul style="list-style-type: none"> • Reduce energy use through reducing the need for travel. • Progressively improve the energy performance of the transport fleet. • Improve the provision and uptake of low energy transport options.
<p>New Zealand Biodiversity Strategy</p> <p>The purpose of the New Zealand Biodiversity Strategy (NZBS) is to establish a framework for action to conserve and sustainably use and manage indigenous biodiversity. Objectives within the NZBS relevant to land transport planning include:</p> <ul style="list-style-type: none"> • 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: Protect biodiversity in coastal waters from the adverse effects of human activities on land and in the coastal zone.
<p>New Zealand Disability Strategy</p> <p>The New Zealand Disability Strategy identifies the government’s goals and objectives for eliminating barriers to participation in the community experienced by the disabled. Objectives related to transport include:</p> <ul style="list-style-type: none"> • Supporting disabled people living in rural areas to remain in their own communities by improving their access to services. • Requiring all new scheduled public transport to be accessible in order to phase out inaccessible public transport. • Encouraging the development of accessible routes to connect buildings, public spaces and transport systems. • Developing nationally consistent access to passenger services where there is no accessible public transport.

New Zealand Health Strategy

The New Zealand Health Strategy identifies the government's goals and priority areas for health. Key goals and objectives relevant to transport planning include:

Goal 4: A healthy physical environment

Supporting objectives

- Support policies that improve access to public transport.
- Reduce the adverse health effects of environmental hazards.

Goal 6: Healthy lifestyles

Supporting objective

- Increase the level of physical activity.

Goal 9: Injury prevention

Supporting objectives

- Reduce the incidence and impact of road traffic injuries.
- Reduce the incidence and impact of workplace injuries.

New Zealand Tourism Strategy

The New Zealand Tourism Strategy identifies four objectives, which have relevance to the transport sector:

- Working smarter – minimising duplication in activities and structure.
- Securing and conserving a long term future – conserving the natural, cultural and social environment.
- Marketing and managing a world class visitor experience.
- Being financially and economically prosperous.

Growing an Innovative New Zealand

Growing an Innovative New Zealand identifies the government's goals for economic development. The strategy's objectives include:

- An open and competitive micro economy.
- A modern, cohesive society.
- Sound environmental management.
- A globally connected economy.

New Zealand Climate Change Programme

The New Zealand Climate Change Programme sets out the government's approach to reducing New Zealand's greenhouse gas emissions. The programme contains a commitment to reduce the impact of transport on climate change.

Vehicle Fleet Emission Control Strategy

The Vehicle Fleet Emission Control Strategy aims to manage the impacts of vehicle emissions on air quality. The strategy contains action points focusing on reducing harmful emissions from vehicles.

4.2.2 Sustainable Development Programme of Action

In looking at the policy framework for transport and, in particular, the integration of sustainability, reference can also be made to the government's *Sustainable Development for New Zealand Programme of Action*. Released in January 2003, the *Programme of Action* builds on the government's response to the 2002 World Summit on Sustainable Development.²

² The *Programme of Action* identifies four priority areas for action: water quality and allocation, energy, sustainable cities, and child and youth development. While some specific actions are identified in respect of these priority areas, a number of actions were already being progressed before the *Programme of Action* was released, such as the implementation of the National Energy Efficiency and Conservation Strategy. Other

In respect of transport policy development, a potentially useful component of the *Programme of Action* is the set of principles for policy and decision making outlined in the document. These principles are intended to underpin all policy development in the public sector (Department of Prime Minister and Cabinet, p10).

The principles state that the economic, social, environmental and cultural consequences of decisions should be taken into account in policy development by:

- Considering the long term implications of decisions.
- Seeking innovative solutions that are mutually reinforcing.
- Using the best information available to support decision making.
- Addressing risks and uncertainty when making choices and taking a precautionary approach.
- Working in partnership with local government and other sectors and encouraging transparent and participatory processes.
- Considering the implications of decisions from a global as well as a New Zealand perspective.
- Decoupling economic growth from pressures on the environment.
- Respecting environmental limits, protecting ecosystems and promoting integrated management of land, water and living resources.
- Working in partnership with appropriate Maori authorities to empower Maori in development decisions that affect them.
- Respecting human rights, the rule of law and cultural diversity.

Notably, a number of the principles identified in the *Programme of Action* can also be found in discussions of SEA principles. Key principles common to the list above and to the SEA principles described in section 2 (see p18) include those relating to:

- Ensuring decision making is informed by quality information.
- Encouraging transparent and participatory approaches.
- Promoting integrated management.

In the absence of any specific criteria for decision making in the NZTS, the principles outlined in the *Programme of Action* could be usefully employed to provide guidance on transport policy development.

4.2.3 Interpreting sustainability in transport policy

From an SEA perspective, the objectives and goals identified in the NZTS and other government strategies serve to draw attention to the economic, environmental and social issues that need to be considered to guide progress towards sustainability in the transport sector. The *Programme of Action* also provides some principles to guide sustainability decision making.

actions are less specific, such as those referring to the government's commitment to work collaboratively with others on the issues identified.

While the framework created by these strategies highlights the need for integration, a potential weakness is the lack of guidance on how conflicts between differing objectives should be addressed. For example, economic development is recognised as an objective in the NZTS and other strategies such as the Growth and Innovation Strategy. In these strategies, economic development sits alongside environmental objectives such as “ensuring environmental sustainability” (NZTS) and “sound environmental management” (Growth and Innovation Strategy). However, there is little guidance on how potential conflicts between economic development and environmental objectives are to be reconciled.

In some instances, it may be possible to interpret a bias in favour of environmental objectives. For example, the New Zealand Biodiversity Strategy requires the use of measures in the sustainable management of production lands and urban environments that are *sympathetic* to indigenous biodiversity. This may be interpreted as favouring environmental protection over other objectives. In other areas, however, different interpretations are possible.

In the context of transport planning, the potential for conflict between differing economic, environmental and social objectives can be expected to be examined in more detail in the implementation of the Land Transport Management Act. In particular, these conflicts are likely to be brought into focus in the public participation processes employed in the preparation of land transport strategies. It is at this level where sustainability is most likely to be debated through the public submission and hearing processes. The provisions of the Act are discussed below.

4.3 Land Transport Management Act 2003

The Land Transport Management Act 2003 (LTMA) is designed to provide an integrated approach to land transport funding, planning and management. To this end, the LTMA introduces a number of amendments to existing transport legislation, including the Land Transport Act 1998 and the Transit New Zealand Act 1989, to ensure a common focus for land transport agencies.

Reflecting the vision statement of the New Zealand Transport Strategy, the purpose of the LTMA is to:

Contribute to the aim of achieving an integrated, safe, responsive and sustainable land transport system (section 3).

The Act also incorporates the five objectives of the NZTS. These objectives are integrated into the Act in requirements relating to the preparation of land transport strategies and programmes by transport agencies. Table 4.2 outlines the key agencies with responsibilities for land transport planning under the LTMA.

Table 4.2 Key agencies responsible for land transport policy and planning

Agency	Key role
Ministry of Transport	The Ministry provides advice to the government on transport policy and planning and is responsible for the administration of the Land Transport Management Act.
Transfund New Zealand	Transfund's key objective is to <u>allocate resources</u> to achieve an integrated, safe, responsive and sustainable land transport system. In meeting this objective, it is required to exhibit a sense of social and environmental responsibility. Transfund is responsible for the preparation of the National Land Transport Programme.
Transit New Zealand	Transit's key objective is to <u>operate the State highway system</u> in a way that contributes to an integrated, safe, responsive and sustainable land transport system. Transit also acts as a roading consultant undertaking studies for regional land transport committees and territorial authorities.
Regional councils	Regional councils are approved authorities under the Land Transport Management Act. They establish regional land transport committees, responsible for preparing regional land transport strategies, and play a role in public passenger transport provision.
Territorial authorities	Territorial authorities are approved authorities under the Land Transport Management Act. They construct, maintain and improve local roads and public passenger transport infrastructure.

From an SEA viewpoint, the LTMA's requirements relating to the preparation of land transport strategies and programmes incorporate several key principles upon which good SEA is based. These principles are reflected in the obligations on transport agencies to ensure:

- Early and full consideration of land transport options and alternatives.
- Early and full opportunities for public participation.
- Adverse environmental effects are avoided.

These obligations can be found, to varying degrees, in the provisions for preparation of the:

- National Land Transport Programme,
- regional land transport strategies,
- land transport programmes.

Table 4.3 summarises the key land transport planning documents provided for by the current policy and legislative framework.

Table 4.3 Key statutory and non-statutory land transport planning documents

Document	Prepared By	Frequency	Statutory/Non-statutory
New Zealand Transport Strategy	Labour-Progressive Government, 2002	Not defined	Non-statutory
National land transport strategy	Minister of Transport	Discretionary	Land Transport Act 1998
National Land Transport Programme	Transfund New Zealand	Annual	Land Transport Management Act 2003
Regional land transport strategies	Regional council	Three-yearly	Land Transport Act 1998
Regional passenger transport plan ³	Regional council		Transport Services Licensing Act 1989
Land transport programmes	Transit, regional councils, territorial authorities and approved public organisations	Annual	Land Transport Management Act 2003

As shown in the table, there is provision for a national land transport strategy to be prepared under the Land Transport Act 1998. However, preparation of the strategy is at the discretion of the Minister of Transport and no strategy has been prepared to date.

Preparation of the National Land Transport Programme and regional land transport strategies is mandatory. Land transport programmes are also required to be prepared by agencies which recommend activities for inclusion in the national land transport programme. The requirements relating to these planning documents are discussed below.

4.3.1 Preparation of the National Land Transport Programme

The National Land Transport Programme (NLTP) is required to be prepared annually by Transfund New Zealand (Transfund).⁴ Under the LTMA, Transfund's overarching objective is to allocate resources to achieve an integrated, safe, responsive and sustainable land transport system (section 68).

Through the NLTP, Transfund allocates funds to:

- Transit New Zealand for the State highway system, including maintenance and construction of roads, regional development, promotion of walking and cycling, and passenger transport-related State highway projects. Transfund fully funds approved works on the State highway system.
- Territorial authorities (comprising city and district councils) to jointly fund maintenance and construction of local roads, passenger transport, regional development and promotion of walking and cycling. Transfund provides a national average of 50 percent financial assistance for maintenance programmes and an additional five percent for construction projects, with local rating revenue providing the balance.

³ Regional passenger transport plans set out the passenger services to be provided in the region.

⁴ The NLTP was previously known as the National Roding Programme.

- Regional councils for the provision of passenger transport services, alternatives to roading (ATR) outputs such as barging or rail freight, and promotion of walking and cycling.

In approving activities for inclusion in the NLTP and before adopting any programme, the LTMA requires Transfund to be satisfied the programme contributes to the purpose of the Act and to the five key objectives set out in the NZTS (section 19(3)). In carrying out its functions, Transfund is also required to avoid, to the extent reasonable in the circumstances, adverse effects on the environment (section 68).

While there are no specific provisions for public participation in the preparation of the NLTP,⁵ the Act imposes a duty on Transfund to ensure, “to the extent practicable, that persons or organisations preparing land transport programmes”:

- Take into account the views of affected communities; and
- Provide early and full opportunities for the public to contribute to programme development (section 68).⁶

In addition, section 68 requires Transfund to ensure that persons or organisations preparing land transport programmes give early and full consideration to land transport options and alternatives.⁷

These obligations give Transfund a key role in ensuring that the preparation of both the NLTP and land transport programmes is informed by proper evaluation of options and the views of the public.

4.3.2 Preparation of regional land transport strategies

The Land Transport Act 1998 provides for transport policy to be established at the regional level through regional land transport strategies (RLTS). The preparation of RLTS is mandatory and each regional council is required to prepare a strategy, which must be renewed at least once every three years. Regional land transport committees (RLTC) are the bodies established by regional councils to prepare RLTS.

With the passage of the LTMA, a number of amendments have been introduced to the Land Transport Act’s requirements for the preparation of RLTS. These amendments strengthen significantly the obligations on RLTCs to consider the environmental and social impacts of transport.

Under changes introduced to section 175 of the Land Transport Act, every regional land transport strategy must:

⁵ The key provisions for participation in the LTMA relate to the preparation of regional land transport strategies and land transport programmes.

⁶ Section 35 of the LTMA also contains a general provision requiring all authorities preparing programmes to consider the needs of persons who are “transport disadvantaged”. The term “transport disadvantaged” is not defined in the Act but is used in other transport legislation (e.g., Transport Services Licensing Act 1989).

⁷ Transfund defines “alternatives” as potential choices between two or more exclusive courses of action and “options” as potential choices of one or more courses of action.

- Contribute to the overall aim of achieving an integrated, safe, responsive and sustainable land transport system.

and

- 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.

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.

The amendments introduced to section 175 also identify a wide range of organisations that must be consulted in the preparation of the RLTS. These include the public in the region, affected communities and Maori.⁸

4.4.3 Preparation of land transport programmes

Under section 12 of the LTMA, land transport programmes (LTP) must be prepared annually by any approved organisation that recommends activities or activity classes for inclusion in the NLTP. Approved organisations include Transit, regional councils, territorial authorities and approved public organisations such as the Department of Conservation.⁹

Similar to the requirements for preparing the NLTP and RLTS, land transport programmes are required to take into account how each activity or activity class contributes to the purpose of the Act. Under Schedule 1, the LTP must also:

- State the objective or objectives to be achieved by each activity and each activity class.
- Include a summary of the consultation carried out in the preparation of the LTP.

⁸ It should be noted that the council is not required to consult if it has already consulted on the matter in the course of preparing its current long term council community plan (LTCCP) under the Local Government Act 2002 (section 179, LTMA). This means it is possible a specific consultation process may not take place during the RLTS preparation process.

⁹ In respect of local authorities, section 13 of the Act provides that an LTP need not be prepared if an authority's long term council community plan or annual plan gives effect to the provisions of sections 12.

- Include the steps the organisation intends to take in developing land transport options and alternatives.

An extensive list of organisations that must be consulted in the preparation of the LTP is outlined in section 15 of the Act and includes:

- Transfund,
- Transit,
- Regional councils and territorial authorities,
- District health boards,
- New Zealand Historic Places Trust ,
- Land transport users and providers,
- Affected communities,¹⁰
- Maori,
- The public.

Schedule 2 sets out a list of “Consultation principles” which must be observed by approved organisations “in such manner as the approved organisation considers, in its discretion, to be appropriate in any particular instance”. The principles are set out in Part 1 of the Schedule and highlight the need to facilitate public input by providing clear and relevant information and ensuring reasonable access to the decision making process.

Part 2 of the Schedule also contains a “special consultative procedure” which must be used by approved organisations when preparing LTPs. The procedure sets out requirements for public submissions and hearings on the draft LTP.¹¹ Public notice must be given advising of the consultation process and a period of not less than one month must be allowed for public submissions.

4.5 Summary

The increased focus on environmental and social factors signalled in the NZTS and the legislative changes included in the Land Transport Management Act strengthen the obligations on transport planning agencies to more systemically analyse and evaluate issues relevant to sustainability.

The objectives and goals identified in the NZTS and other government strategies assists to highlight the need for policy integration across sectors, an important component of SEA. The framework created by the strategies also serves to draw attention to the economic, environmental and social issues that need to be considered to guide progress towards sustainability in the transport sector.

¹⁰ Affected communities are defined as a group of people who are affected by a proposed activity because of living, studying or working in close geographical proximity to the activity.

¹¹ This procedure is not as extensive as the consultation requirements of the Resource Management Act. Under the RMA, the public has the opportunity to make submissions, further submissions and to make an oral submission at a public hearing. The RMA also enables a council’s decision to be referred to the Environment Court. Appeal rights are not provided under the LTMA.

Importantly, the planning and public participation requirements of the LTMA incorporate a number of elements of effective SEA. These are primarily integrated into the Act's requirements for:

- a focus on sustainability,
- early consideration of land transport options and alternatives,
- early and wide public participation,
- avoidance of adverse environmental effects.

Collectively, the NZTS and the requirements of the LTMA can be seen as providing entry points for the use of SEA methods and techniques in New Zealand's transport planning framework. These entry points can be found at the national level where the NLTP is being prepared and at the regional and local level in the preparation of RLTS and LTPs.

The following section examines the processes currently used to prepare land transport strategies and programmes and discusses how SEA approaches could be integrated into these processes.

5. Opportunities for SEA in New Zealand Transport Planning

5.1 Overview

Within New Zealand's transport planning framework, there is no formal requirement for SEA. However, as discussed in the previous section, current legislative and policy arrangements require environmental and social impacts to be assessed in the development of strategies and programmes.

In this section, transport strategy and programme development approaches are examined with the purpose of identifying:

- Existing processes and methods used to address sustainability considerations.
- Opportunities to improve current processes and methods by incorporating SEA approaches.

The SEA approaches referred to in this section are derived from the “para-SEA” approaches described earlier in section 2 (page 12) where SEA elements are “threaded” seamlessly into the wider policy or planning framework. The difference between this approach and a formal SEA can be illustrated by the idea of “SEA of a strategy” (formal SEA) and “SEA within a strategy” (para-SEA). The SEA of the Scottish Regional Transport Strategy (section 3.4.1) is an example of the former while the multi-modal studies in the UK illustrate the latter.

5.2 Government strategies

5.2.1 New Zealand Transport Strategy preparation

The New Zealand Transport Strategy has broadened the transport planning horizon, expanding the focus beyond the narrow concentration on road building and maintenance that has characterised planning for much of the past decade.

From an SEA perspective, the strategy can be viewed as a means of signalling new policy options and directions rather than providing detailed guidance. While the vision and objectives set a general direction, there is little else in the document that provides guidance.

By identifying priorities for action, the NZTS could have resulted in a more detailed roadmap on how to achieve the key objectives identified. These priorities could have been informed by reference to the goals and targets established in other government strategies and programmes. For example, the New Zealand Climate Change Programme provides a context in which the NZTS could have explored priority actions for addressing the greenhouse gas burden of different transport modes.

Linked policy areas, such as motor vehicle emission standards, could also have been introduced to good effect. Arguably, the application of SEA to the NZTS would have given clearer guidance to the transport policy and planning community when progressing strategies and programmes.

5.2.2 Other supporting strategies

Following the completion of the NZTS, the Ministry of Transport began work on a number of supporting strategies. These strategies cover specific aspects of land transport and include:

- freight,
- rail,
- cycling,
- walking.¹²

The freight and rail strategies have been identified as priorities, with cycling and walking to follow. Work on the freight strategy is at a very early stage. It does not yet have a formal mandate or a defined scope (Glenda Spackman, Ministry of Transport, pers. com.). Preliminary indications are that work on the strategy will progress in three stages as follows:

- statement of objectives,
- identification of key issues/drivers/factors,
- examination of trade offs.

If followed, this approach will allow the examination of environmental and social impacts in a “classic” EIA manner. Broad scale multi-modal studies could be applied as is routine overseas. To fully meet internationally accepted standards of SEA, public consultation would be required with all stakeholder groups.

Due to the fact that work on the strategy is in the very preliminary stages of development, further discussion is not provided here.

5.3 Regional level strategies

5.3.1 Overview of regional land transport strategies

The requirement to prepare regional land transport strategies (RLTS) was established by the Land Transport Amendment Act 1993. Regions incorporating large metropolitan centres were the first to produce RLTSs, some of them following on from and extending city based transport plans (e.g., Auckland). With significant investment in road transport models and established local authority networking, these regions have produced increasingly more comprehensive strategies. All regions now have an RLTS, with the majority prepared prior to the introduction of the NZTS in December 2002.

Generally, RLTSs produced in the Auckland, Wellington and Canterbury regions are well structured documents, with a vision and clearly articulated objectives and policies. The Otago and Waikato regions have taken a similar although less expansive approach. The

¹² Independently led by the Land Transport Safety Authority, a National Road Safety Strategy was produced in 2002.

objectives contained in the Land Transport Act (section 175), namely economic efficiency, safety, environmental sustainability and accessibility, appear as a common thread. Regional land transport committees (RLTC) with wide representation and a strategy development process involving public consultation are common.

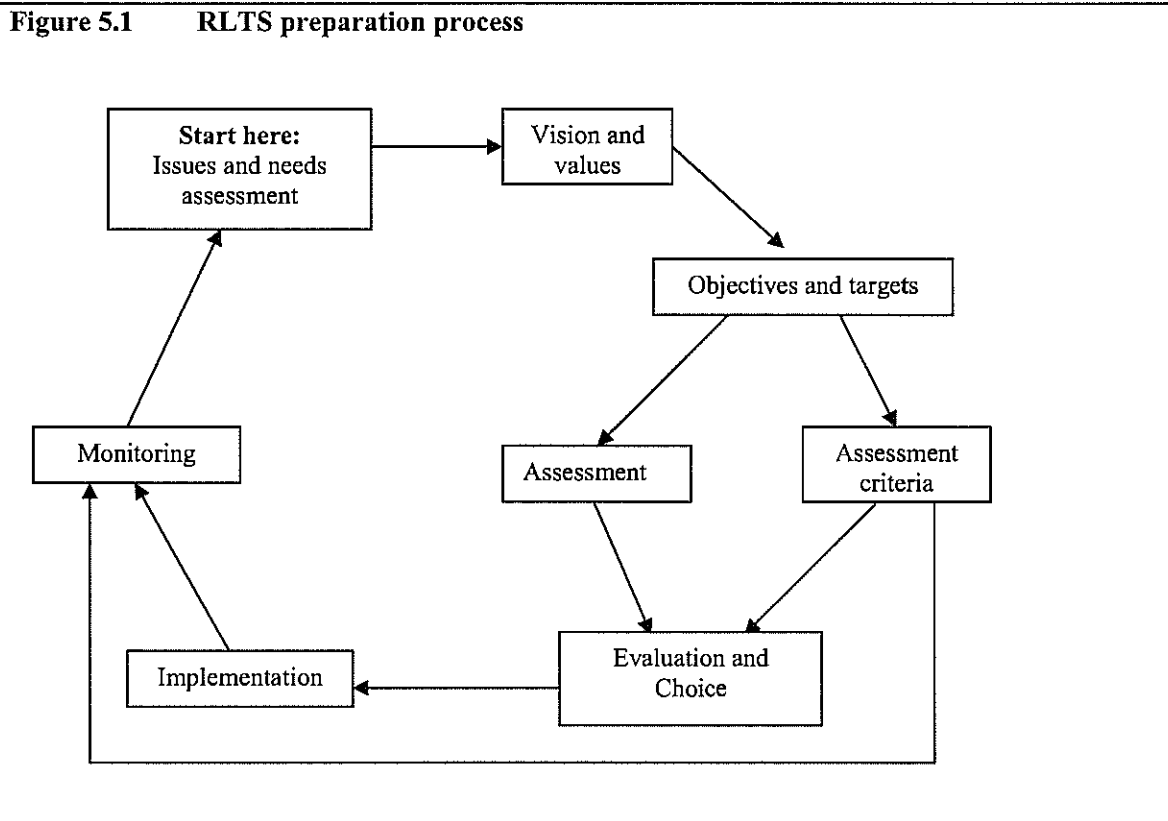
RLTSs from other regions range in style, approach, scope and content from being little more than lists of roading projects to high level policy documents with little connection to planning or programme delivery. Guided by statutory requirements, regional land transport committees from these regions have involved different stakeholder groups but the process of wider community involvement varies in extent and in focus. In at least one region, the RLTC has been the regional council with no additional representation.

The scope and content of RLTS are influenced by practical considerations of scale, as well as by the constraints imposed by political will and resource availability. For instance, in the Taranaki RLTS, the regional passenger transport plan is included within the document, whereas in most regions where passenger transport plans have been produced, they are a separate document subject to a separate, although often parallel and integrated process.¹³

5.3.2 Preparation process

As noted, the three major metropolitan areas, Auckland, Wellington and Canterbury have all produced strategies following a generally similar process as set out in Figure 5.1. In outline, the process shows a close parallel with the appraisal-oriented SEA procedure described in section 2 of this report.

¹³ As noted in the previous section, regional passenger transport plans are provided for under the Transport Services Licensing Act 1989. The plan is required to specify any passenger transport services to be provided within the region and must be prepared in consultation with the public. A potential shortcoming in the legislation is the fact that regional passenger transport plans are required to describe current service provision only while there is a widely recognised need for a more strategic plan to address passenger transport.



5.3.2.1 Canterbury Regional Land Transport Strategy

The process followed by the Canterbury regional land transport committee in preparing the region's land transport strategy provides an example of the approaches and methods generally used in RLTS preparation. Canterbury has produced strategies at intervals of between three and six years covering the periods 1993-1998, 1996-2001, 2002-2007. As is the case in other regions, the strategies reflect the policy and funding guidelines of the particular period. They also show changes in methodology and comprehensiveness since first produced.

The current strategy provides a framework of goals and objectives, followed by supporting policies, methods and major projects. However, there is no implementation programme, an omission that the report itself acknowledges with the comment "For the strategy to achieve the greatest results an implementation programme should be developed" (Environment Canterbury, 2002).

The key planning and assessment stages are described more fully below for the most recent Canterbury RLTS, published in 2002.

- Stage 1: Visioning and goals
Workshops and meetings were held with selected stakeholders in different locations culminating in a “Vision and Goals” document. The vision and goals were subsequently adopted by the regional land transport committee in late 1999.
- Stage 2: Objectives, assessment and analysis
Stage 2 was largely an internal process involving modelling (principally transport density/flows), forward-looking needs analysis and the development of four “cartoon” strategies. These were contrasting strategies based on investment bias in different areas (e.g., public transport dominated, private transport dominated) through to mid 2000.¹⁴
- Stage 3: Choice - policies, methods, actions
Stage 3 set out to derive a preferred strategy direction and identify supporting policies, methods and actions. The process was internal initially. A draft document was released for public submissions in late 2001. The strategy was finally adopted in March 2002.

The work undertaken to arrive at the four “cartoon” strategies is described as “multi-iterating”. Through this process, the full range of possible approaches was narrowed down by evaluating them against the overarching goals and objectives. In the process and in the final assessment the governing criteria were, in order:

- congestion relief,
- affordability of infrastructure and services,
- land use and environmental compatibility.

The approach followed by the Canterbury RLTC is one commonly used in New Zealand. In a number of respects, it has similarities to SEA approaches employed internationally. This is illustrated in Table 5.1 which provides a comparison of the RLTS process and the appraisal-oriented UK SEA model.

Many elements of SEA good practice can be found in the process followed by Canterbury, particularly the consideration of options, wide public consultation over extended time frames and a generally open process culminating in a published report. However, the scope and quality of the work undertaken in each of these areas is the full test of SEA adequacy. Critical elements of the process, such as the evaluation of the “cartoon” scenarios, are dependent on the effective application of impact assessment based on good information. This is examined in more detail in Table 5.1.

¹⁴ The Auckland regional land transport committee developed three “extreme” scenarios, more or less equivalent to Canterbury’s “cartoon” strategies. From these, four revised scenarios with different emphases on passenger transport and roading investment were developed. All but the passenger transport emphasis were modelled with marginal cost pricing.

Table 5.1 Comparison of appraisal-oriented SEA and RLTS development

Appraisal – oriented SEA	RLTS Development Process
<i>List the objectives</i> of the proposal and <i>summarise the policy</i> issue, identifying constraints and trade-offs.	Vision and objectives set and policy issues canvassed.
<i>Specify the range of options</i> for achieving the objectives, including the “do nothing” option.	Options developed via modelling and scenarios shaped. Do nothing option, rarely if ever canvassed.
<i>Identify and list all impacts</i> on the environment and consider mitigation measures to offset them.	Impacts identified but limited work (at this stage) on mitigation.
<i>Assess the significance</i> of the impacts in relation to other costs and benefits.	Assessment of significance of impacts generally based on existing data and undertaken using simplistic methods.
<i>Value costs and benefits</i> , including those based on monetary values, ranking or physical quantities.	Valuation of costs and benefits of non-environmental aspects mostly. Few environmental aspects subject to monetary valuation.
<i>State the preferred option</i> with reasons for doing so.	Preferred option stated (may have political bias).
<i>Monitor and evaluate</i> the results, making appropriate arrangements for doing so as early as possible.	Monitoring and evaluation always done but on poorly balanced range of indicators.
<i>Source:</i> UK Department of Environment, Transport and the Regions, 1991, updated 1998.	

5.3.3 Recognition of environmental sustainability in RLTS preparation

Since December 2002, with the release of the NZTS, environmental sustainability has been an explicit reference point for regional land transport planning. For some regional land transport committees (e.g., Auckland and Canterbury in 1996) it has been a goal or objective previously identified in transport planning.

However, even where environmental sustainability has been included in the initial planning focus, the present generation of RLTS still address environmental issues primarily on an effects management basis. Although sustainability may be stated in the vision statement or identified as a primary or “equal” driver from the outset, it appears to have been lost sight of or marginalised in the strategy preparation process.

While the language used in the recent RLTS reports reflects environmental sustainability objectives, the modelling and assessment approaches are still strongly anchored in the environmental effects mitigation mode. Reflecting the emphasis on project level EIA in the RMA consent process, impact assessment tends to be “deferred” until more concrete proposals start to emerge from subsequent scheme assessment work and/or funding programmes.

This narrow effects mitigation response to environmental sustainability to date is illustrated in the 2003 Auckland RLTS. The strategy's objectives are introduced with reference to the key principles of safety, efficiency, environmental sustainability and accessibility. Objective four of the strategy is to:

Avoid, remedy or mitigate the adverse impacts of transport on the environment and on the health and well-being of communities.

A small group of policies is identified to support this objective. However, in the strategy's implementation section, there is little evidence of how the objective and policies are to be given effect. Aspects of transport management that the strategy identifies as contributing to sustainability (e.g., cycling, walking and travel demand management) and described as components of the transport system are absent from the implementation plan. They sit outside the strategy in separate and usually subsequent reports.

It may be argued that these "additional" or more specialised issues are better addressed in separate strategies. However, at a minimum, it could be expected that the RLTS would identify the methods, timeframes and funding relating to these issues. This is not the case. The RLTS implementation programme is almost exclusively devoted to major roading projects. The Wellington and Canterbury strategies have a similar separation, with variable levels of detail.

Notwithstanding the introduction of the NZTS, the very recent RLTSs for the Bay of Plenty (February 2003) and Tasman District (June 2003) are similarly silent on the subject of environmental sustainability, addressing instead environmental effects mitigation.

5.3.4 RLTS modelling

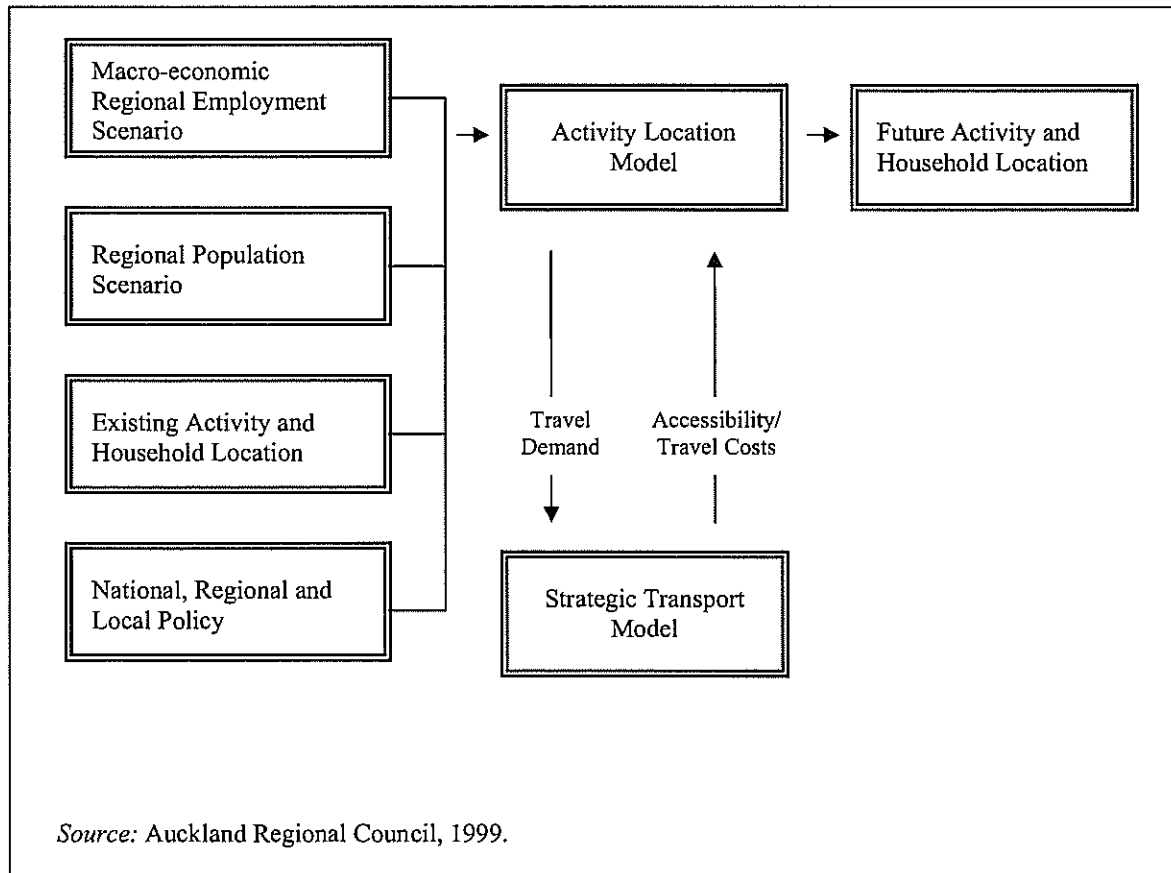
The design and application of computer models in regional land transport planning influences significantly the opportunity to evaluate environmental and social impacts resulting from different mode choices (or mixes). Aspects of relevance to sustainability that may be informed by modelling include:

- carbon dioxide emissions,
- other gaseous emissions and particulates,
- noise,
- severance effects on communities,
- access and mobility opportunities,
- fuel efficiency.

In RLTS preparation, modelling is typically undertaken using modern computer models. In Auckland, two models are used, namely, the Auckland Regional Transport (ART) model and the Auckland Strategic Planning model (ASP). ART is a conventional transport model, which covers the whole of the Auckland urban area and part of the adjacent rural hinterland. The ASP model covers the whole Auckland region. Both models have been designed to address transport and land use issues at a regional level to inform regional policy development. Both models are considered by Transfund and its consultants to be up to date, effective and used well.

Figure 5.2 identifies the land use/transport interaction in the most recent Auckland modelling.

Figure 5.2 Land use - transport interaction model



The Auckland model design provides wide scope for mapping interactions between land use and transport. Typically, separate but inter-related evaluation factors are assessed for selected policy options. In 1994, the evaluation factors were:

- Environmental: assessing likely consequences on the resource base.
- Economic: assessing development capacities and cost.
- Social: incorporating community well-being factors.
- Strategic: assessing the likely acceptability of any policy direction and the implications for the present regional development direction.

The purpose of this process was to determine the impact of selected policy options relative to the prevailing situation (Auckland Regional Council, 1994). As with any model, the analysis provided is dependent not only on the quality of the information, but also on the questions asked of the model. To some extent, the questions asked of the Auckland model have been restricted. For example, in examining the environmental impacts of the transport

system, modelling was used to identify the likely fuel use and CO₂ emissions from four selected scenarios. However, modelling did not include a mass transit system, which council staff suggested may have been able to show a meaningful difference between options (Auckland Regional Council, 1994).

Further, opportunities to examine particular land use or transport scenarios based on less traditional or funding constrained assumptions are not generally used. For instance, modelling undertaken for the 2003 RLTS using different population densities gave only small changes in outcome, within the margin of error of the modelling. However, population densities used were still relatively conservative (Joy Grant, Auckland Regional Council, pers. com.). No modelling was done using the much higher population densities and urban arrangement settings that are shown in other cities to sustain public transport options such as light rail.

Recent modelling using “mesh-block based” deprivation index information has examined the impact of changes in public transport investment on communities of different socio-economic status. However, relatively little work has been undertaken to approach Auckland transport modelling in a way that identifies infrastructure and services development to support sustainable urban environments.

In the preparation of the Wellington RLTS, modelling covered multi-modal options for public transport. The strong history of public transport investment and use in the region, possibly unique in New Zealand, ensured that both rail and bus options were examined. In general, modelling to examine the contribution of rail to transportation needs is not widely undertaken. However, the opportunity to examine the comparative output of carbon dioxide, particulates and fuel efficiency was not fully exploited.

The model used in the Canterbury RLTS is the Christchurch Transport System (CTS) model. Essentially, it is a city model but includes nearby Rangiora and Rolleston. It is a single mode, motor vehicle model but can be used to illustrate the impact of buses.

5.3.5 Data availability and assessment methodology

Fundamental to effective SEA, and comparative assessment of any type, is quality data. Five yearly census data underpins current transport planning in New Zealand providing information about residence location, work location and principal travel mode on the day of the census. It also provides a motor vehicle count by household and location.

Depending on resources and the political commitment to transport planning, additional data may be collected by local authorities for regional and local transport strategies and programmes. In addition to mode, destination, time and density measurements, some environmental data may be collected.

Air quality is the most common data collected, although the number of measuring stations is limited.¹⁵ Some water quality measurements are available as well. Information on the

¹⁵ The region with the greatest number (18) of stations is Auckland, although only half of these measure more than one determinant.

community severance effects of increased traffic flows or extended peak durations on suburban roads either does not exist or is not used. Community public health studies relating to access to public services, education and employment are rare, although their relevance to transport planning may not have been widely recognised by transport planners to date.

In general, environmental and social data to inform transport planning is slim and its collection points widely spaced in time and place. However, some new tools are emerging such as that described in the Box 5.1.

Box 5.1 Vehicle Fleet Emissions Model

The Ministry of Transport is developing a Vehicle Fleet Emissions Model/Environmental Capacity Analysis Framework for use in transport planning. It provides a picture of the motor vehicle fleet at present and allows analysis of forward projections of vehicle emissions, including greenhouse and other gases, based on improvements in technology. This information can also be interfaced with GIS systems onto land use models or traffic models. It is at an advanced stage of development, requiring some further work and peer review.

RLTS revisions may generate special studies to fill data gaps. Though important and worthwhile, these tend to be restricted in scope to reflect options emerging from decisions based on more data rich subjects, such as economic indicators, traffic flows and cordon counts. For example, in the preparation of the 2002/2007 Canterbury RLTS formal studies involving quantitative and/or qualitative analysis were conducted on travel times, reduction in pollutants and desired land use. However, no data or studies enriched the analysis of the strategy's objectives of "affordability for all users", "pleasant to use", and "empowerment". Described by participating staff as being qualitative rather than quantitative, this part of the RLTS work is where formal SEA is likely to be particularly effective.

The RLTS preparation processes for all three metropolitan regional land transport strategies examined used straightforward evaluation techniques to assess different sets of scenarios against transport planning targets or objectives, or performance criteria. The "score card" or "planning balance sheet" approach is illustrated by an example of one used in the development of the Canterbury RLTS (Figure 5.3). While described as an evaluation matrix, it is little more than a check list.

The matrix summarises the comparative impacts on the planning objectives (desired outcomes) of nine transport scenarios under examination at that particular part of the planning process. A simple positive, neutral, negative scale is used. It was carefully prepared but with little hard data and, in some cases, none.

In Auckland, a similar matrix approach was used, described by one staff member as "not a very sophisticated process". Constraints on producing a more thorough analysis were identified as lack of time, variable data quality and quantity, a restricted budget and, to a lesser extent, weakness in methodology.

Scaling and weighting methods used for comparing model output results and evaluating possible monitoring indicators tend to be unsophisticated, based on arbitrarily allocated values. These methodologies are most commonly applied by internal specialists without reference to other expert groups. Sensitivity tests are rarely applied to the applications.

Scale:
 +, ++ positive effects of increasing scale
 -- negative effects of increasing scale
 0 no overall impact
 ? effects uncertain

	CARS DOMINANT (FREE FLOW ROADING)	HIGH QUALITY PUBLIC TRANSPORT (BUS)	HIGH QUALITY PUBLIC TRANSPORT (BUS & RAIL)	CYCLE DOMINANT	PEDESTRIAN DOMINANT	CONCENTRATED LAND USE	FULL MARGINAL COST PRICING	DEMAND MANAGEMENT THROUGH REGULATION
OBJECTIVE 1	LOW TRAVEL TIMES	+	0	-	--	+	+	-
OBJECTIVE 2	RELIABLE TRAVEL TIMES	+	0	-	--	+	+	-
OBJECTIVE 3	SAFETY	+	+	--	+	0	+	+
OBJECTIVE 4	AVAILABILITY OF TRANSPORT OPTIONS	+	++	+	+	+	+	0
OBJECTIVE 5	AFFORDABLE TRANSPORT OPTIONS FOR ALL USERS	+	+	+	+	+	--	-
OBJECTIVE 6	AFFORDABLE TO THE REGIONAL ECONOMY	--	--	+	+	?	+	0
OBJECTIVE 7	COST-EFFECTIVE	?	?	?	?	?	?	?
OBJECTIVE 8	REDUCTION IN POLLUTANTS	--	++	++	++	+	+	+
OBJECTIVE 9	MAINTENANCE OF BIO-DIVERSITY	--	0	+	+	+	+	+
OBJECTIVE 10	FREE FROM CRIME AND PERSONAL DANGER	--	+	0	++	0	0	0
OBJECTIVE 11	PLEASANT TO USE	--	0	0	+	0	+	0
OBJECTIVE 12	SUPPORTS DESIRED URBAN FORM	--	+	+	+	++	-	0
OBJECTIVE 13	FACILITATES SOCIAL INTERACTION	--	+	+	++	+	0	0
OBJECTIVE 14	EMPOWERMENT, PARTICIPATION	?	?	?	?	?	?	?
OBJECTIVE 15	INNOVATIVE AND RESPONSIVE TO CHANGE	0	--	0	0	0	0	0
OBJECTIVE 16	RESILIENT TO DISRUPTION FROM NATURAL HAZARDS	+	--	+	++	0	0	0
OBJECTIVE 17	INTEGRATION BETWEEN URBAN AND PERI-URBAN NEEDS	+	+	--	--	0	+	-

Figure 5.3 Environment Canterbury: Regional land transport strategy development matrix

5.3.6 Opportunities for SEA implementation in RLTS preparation

Viewed from an SEA perspective, the process of preparing the Auckland, Wellington and Canterbury RLTSs share characteristics of EIA-based SEA approaches and can be described as examples of para-SEA. In practice, however, there are opportunities for more effective and rigorous analysis through the use of improved assessment methodologies and modelling inputs. There are also opportunities to take advantage of overseas developments in the application of SEA to transport policy and planning.

The observation made in the introduction regarding the weakness of SEA “within a process” is well illustrated here. Until or unless SEA is acknowledged as a formal part of the RLTS preparation process, appropriate weight in time and resourcing is unlikely to be given to environmental and social factors. Its formal inclusion does not need to be a legal requirement as an administrative or governance decision can give it effect.

By way of contrast, a useful exercise would be to follow the type of approach to SEA used in *Setting Forth*, the Scottish regional transport strategy described in Box 3.3. A stand-alone SEA of a New Zealand RLTS would undoubtedly yield useful results.

For RLTSs completed under the previous legislation, an SEA of the effects of plan implementation on the environment could serve two important functions. At a minimum, it could identify areas or aspects where mitigation measures might be required to address adverse environmental impacts or enhance positive impacts. More optimally, SEA could be applied to ensure plan objectives and options advance environmental objectives as far as possible (win-win approach) and ensure that loss and damage are minimised or remedied (in accordance with sustainability principles).

5.4 Sub-regional programmes and strategies

At a sub-regional level, strategic studies arise from and form part of the work of the regional land transport committees and from the statutory responsibilities of Transit in the management of the state highway network.

5.4.1 Strategic studies by approved organisations

Regional land transport committees use regional council staff and/or consultants to undertake specific strategic studies within the context of RLTS preparation. Transit is commonly employed as the consultant for larger projects.

One recent example, funded jointly by Transfund (on application by Transit) and the Auckland Regional Council, is a feasibility study examining the construction of a second Waitemata harbour crossing (Transit New Zealand). This is the most recent of a series of studies on the provision of additional capacity across the Waitemata Harbour, dating back to 1987. A previous study in 1997 to identify and evaluate options for an additional harbour crossing was released for public comment and led to the conclusion that the best option would be to site the second crossing in the vicinity of the present harbour bridge.

The 2002 study, to strict locational guidelines set by the RLTS, required investigation of crossing options “in the vicinity of the existing harbour bridge”. The study’s terms of reference called for a scheme that “plans for and protects the ability to implement a passenger transport connection” and ensures capacity to “include provision for walking and cycling”.

Within these constraints, the objective of the study was to determine if it was practical to construct the crossing in the vicinity of the existing harbour bridge and answer the following questions:

- What are the alignment options?
- What are the options for the form of crossing?
- What are the possible environmental impacts, construction issues, risks and preliminary costs for different crossing forms and alignments?

Notwithstanding significant restrictions on the consideration of options, this study illustrates the potential opportunities for SEA in transport planning in New Zealand. The questions which the study sought to address represent a simple summary of an SEA process. Application of SEA approaches in the 1997 study would have been even more relevant.

5.5 Land transport funding

5.5.1 Transfund funding allocation

Transfund’s annual National Land Transport Programme sets out funding allocations between output groups covering roading, public transport, alternatives to roading and walking and cycling. It is compiled from land transport programmes submitted annually by approved organisations, predominantly regional councils, district councils and Transit.

Current allocation between output groups is anchored in a significant demand for roading maintenance and construction. The balance is distributed to:

- Provision of passenger transport services.
- Alternatives to roading (alternatives to the provision or maintenance of roads).
- Regional development funding for regions that have acute transport needs.
- Promotion of walking and cycling.

Table 5.1 shows the funding allocated to these output groups for 2002/2003 and 2003/2004.

Table 5.1 Land transport funding for 2002/2003 and 2003/2004

Output	Funding 2002/03 \$M	% of total	Funding 2003/04 \$M	% of total
Roading maintenance	\$553.35	50%	\$587.80	49%
Roading construction	\$348.58	32%	\$388.88	33%
Regional development assistance	\$26.67	2.4%	\$23.16	1.9%
Public transport assistance	\$85	7.7%	\$101.08	8.5%
Administration	\$53.73	4.9%	\$57.28	4.8%
Alternatives to roading	\$29	2.6%	\$28.00	2.4%
Walking and cycling	\$3.67	0.3%	\$3.8	0.3%
Total	\$1100 m	100%	\$1190 m	100%

Source: Transfund New Zealand, 2003, p7.

As shown in the table, roading maintenance and construction absorbed the majority of funding (82%) in each year. According to Transfund, the roading maintenance allocation can be expected to account for a similar amount of funding in future years, given the ongoing requirements of maintaining the existing roading network.

For the years shown, public transport assistance increased slightly from 7.7% in 2002/03 to 8.5% in 2003/04. Alternatives to roading and walking and cycling (a new output for 2002/2003) received a similar percentage of funding in each year (Transfund New Zealand, 2003, p7).

In the period since the adoption of the NZTS and the introduction of the LTMA, Transfund's funding allocation framework has been required to reflect a much wider range of issues than in the past. Obligations to consider environmental and social impacts in addition to economic factors have been strengthened, requiring the introduction and use of analytical tools common to the SEA toolkit.

5.5.2 Criteria for funding allocation

As the national funding agency, Transfund has an important role in the implementation of the new approach to transport planning established in the NZTS and the LTMA. It also has a significant role in ensuring that environmental and social impacts are assessed. The mechanism through which Transfund allocates funding is the Transfund Allocation Process (TAP).

In determining funding for specific projects under each output class, Transfund has traditionally relied on the benefit cost ratio (BCR) and efficiency ratio (ER) of the project. The benefit cost ratio (BCR) is used to assess roading projects and the efficiency ratio (ER) is used for alternatives to roading (ATR).

Transfund's *Project Evaluation Manual* (PEM) sets out the requirements for the evaluation of roading projects. It details the procedures for undertaking cost benefit analysis. Both the PEM and its equivalent manual for ATR funding evaluation identify environmental and other "intangible" effects and give guidance on how to assign financial values to them.

Both the BCR and the ER guidance manuals identify three levels of effects for consideration in project evaluation as follows:

- a) Tangible effects with standard monetary values, e.g., vehicle operating costs and the value of work travel time.
- b) Intangible effects that have been given a standard monetary value, e.g., the statistical value of human life, the comfort value of avoiding unsealed roads and carbon dioxide.
- c) Intangible effects that have not been given a standard monetary value, e.g., water quality, ecological impact, severance effects and psychological stress.

Notwithstanding the significant limitations in the scope of environmental and social considerations, BCR and ER approaches may be appropriate for internal comparisons within a region and to establish project rankings. However, evaluation of the comparative economic, environmental and social benefits of different alternatives and, in particular, different mode solutions within a single corridor drawing on different output group budgets is not easily achieved using this approach alone.

5.5.3 TAP - Transfund's allocation process

For 2004/2005, Transfund has redeveloped the framework used to allocate funding. The revised TAP framework is intended to better reflect the objectives set in the NZTS and the new requirements contained in the LTMA. While the traditional BCR remains a key factor, other environmental and social criteria now need to be considered.

According to Transfund, the revised TAP aims to provide a more rounded, objectives-led approach, focused on the funding of packages of projects designed to address a strategic need. A package might comprise a number of construction elements (multi-laning, straightening, by-pass) within a single corridor and staged over a number of years or it might be a mix of public transport improvements, dedicated lanes and parkways, as well as road improvements. Previously dominant cost benefit analysis and efficiency ratios remain in place but are said to “guide not drive” the allocation process.

Released by Transfund in December 2003, the TAP document provides evaluation forms for approved organisations to use for the assessment and optimisation of proposals and matching evaluation forms for Transfund's use. Applicants are invited to provide an “evidence based assessment of proposals against evaluation factors”, which are identified for the five core objectives established in the NZTS and built into the LTMA.¹⁶

Transfund has made considerable effort to guide applicants towards a systematic evaluation based on the objectives through the provision of assessment forms and supporting guidance material. However, the environmental and social evaluation factors used invite critical comment.

¹⁶ As outlined in the previous section, the objectives are: assisting economic development; assisting safety and personal security; improving access and mobility; protecting and promoting public health and ensuring environmental sustainability.

In assessing whether activities contribute to the objective to protect and promote public health, three factors are identified as shown in Table 5.2. In respect of the objective to ensure environmental sustainability, the assessment framework identifies eight factors against which activities are to be measured (Table 5.2). Both a qualitative and quantitative analysis of each factor is required.

Table 5.2 TAP assessment factors

Objective	Factor	Quantitative analysis
Protect and promote public health	Physical fitness	Beneficial/neutral/adverse
	Walking effects	% and absolute change in number of walking trips
	Cycling effects	% and absolute change in number of cycle trips
Ensure environmental sustainability	Landscape/townscape	7 point scale
	Heritage of historic resources	7 point scale
	Biodiversity	5 point scale
	Noise and vibration	% and absolute change
	Air quality	% and absolute change
	Greenhouse gases	% and absolute change
	Water environment	% and absolute change
	Effect on non-renewable resources	% and absolute change

These factors are noted in the initial assessment framework (form AF1) as “examples only” and others may be used by approved organisations. In the detailed assessment framework (form AF2) the same evaluation factors are listed. Reference is also made to the high level outcomes in the Ministry of Transport’s 2003/4 Statement of Intent.

In terms of EIA good practice, the list of evaluation factors is limited. For example, the environmental sustainability factors include only a limited range of land use and spatial planning issues. These issues extend beyond the landscape/townscape and historic heritage factors listed.

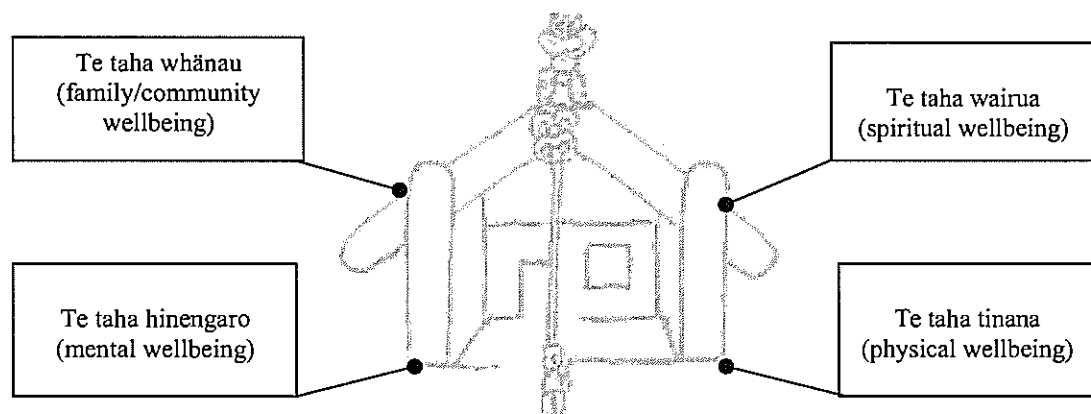
Similarly, transport’s actual and potential contribution to positive public health outcomes, which the first set of evaluation factors covers, arises from more complex aspects than the three listed. Box 5.2 provides an explanation of the concept of health used in the *Health Impact Assessment Guidelines* recently published by the Public Health Advisory Committee. Public health is defined as “the science and art of preventing disease,

prolonging life and promoting health through the organised efforts of society”. It includes mental as well as physical health.

Box 5.2: Concept of health

Health is not just about the absence of physical injury or disease. The ‘Whare Tapa Wha’ model, illustrated in the figure below, is used as a concept of health in the health impact assessment guide developed by the Public Health Advisory Committee. Te Whare Tapa Wha takes a broad view of health that includes physical, mental, emotional, social and spiritual wellbeing. It is widely used in the New Zealand health environment and is consistent with international definitions.

Depicted as a four-sided house, Te Whare Tapa Wha represents health not only in terms of physical and mental well-being but also gives weight to the interrelated components of family and personal relationships and to a spiritual dimension. All four sides of the house need to be strong and balanced to ensure health and well-being.



Source: Public Health Advisory Committee. December 2003, p13.

In respect of the environmental sustainability objective, the detailed assessment framework (form AF2) lists four outcomes that encompass broad sustainability outcomes. They are

- The energy performance of the transport fleet is improved.
- Transport generated air, noise, vibration, exhaust emissions, waste, other contaminants are reduced.
- Transport uses land and other resources more effectively.
- The negative impacts of transport on natural, cultural and heritage values are minimised.

These more helpfully widen the scope of the subject beyond the lists above. However, as they stand, they fall short of criteria for evaluating transport strategies and programmes in terms of environmental sustainability. The next step would be to identify specific targets and indicators that focus and measure, respectively, the four required outcomes.

5.6 Consideration of alternatives

Consideration of alternatives is one of the founding principles of EIA and a key component of SEA. The “do nothing” alternative is one of the options that should be considered as a matter of course. Transfund’s *Project Evaluation Manual* notes the importance of evaluating all realistic project options, stating that mutually exclusive options must be addressed. The PEM also refers to the “do nothing” option but observes that “in the case of roads it is often not practical to do nothing”. It recommends a “do minimum” approach be used as the basis for evaluation.

More explicit requirements to consider alternatives and options have been introduced in the LTMA. These requirements apply to both Transfund and to approved organisations. In guidance documents to assist approved organisations to prepare land transport programmes, Transfund identifies “alternatives” as fundamentally different courses of action and “options” as the different ways of implementing the chosen alternative.

Approaches to strategy development involving computer modelling are well placed to generate options. In the Auckland, Wellington and Canterbury modelling noted earlier, “cartoon” scenarios were developed to assess options at the strategic level. While there were some problems with the modelling used, such as the conservative assumptions underlying the models, these problems can be addressed.

The new TAP, with its focus on packages rather than individual projects, should promote consideration of options. Challenges remain to the full and effective consideration of alternatives. Silo thinking is still promoted by the ring fencing of output funding and by the distribution of project types in different planning documents. For instance, roading maintenance requirements are found in asset management plans and long term council community plans (LTCCP) prepared under the Local Government Act 2002. However, it is unlikely that their development in this context will involve consideration of factors such as funding of different modes.

5.7 Monitoring

Monitoring the effectiveness of the SEA process itself is a best practice component of SEA and one that is not well or widely done in any jurisdiction. The researchers found no evidence of this amongst the overseas work investigated but note that there exist two strong vehicles for its completion in New Zealand.

The Land Transport Act requires regional councils to prepare an annual report on progress in implementing RLTS. This report must be sent to the Land Transport Safety Authority, Transfund New Zealand, Transit New Zealand, New Zealand Police and the Ministry of Transport by 30 September each year. To gauge the effectiveness of strategies and enable monitoring, all RLTS must contain objectives and performance indicators. The annual report on progress in implementing the strategies focuses on these indicators.

As with all aspects of the preparation of RLTS, monitoring varies in quality across the country.¹⁷ In the more comprehensive RLTS, such as the Auckland strategy, performance indicators have been developed and targets set. In general, the indicators have been selected due to the fact there are existing information sources rather than that the indicator is the most useful or relevant for the purpose.

The Auckland RLTS addresses environmental effects as one of five objectives with indicator measures and targets set for:

- air quality related to vehicle emissions (measured at selected locations),
- fuel use/CO₂ emissions,
- water quality related to run-off from the transport network.

In the Wellington RLTS, a comparative set of indicators is identified with several targets. Targets are set for both numeric outputs (e.g., traffic volumes, emission concentrations) and, usefully, progress in developing and implementing policies.

While monitoring reports are required to be prepared on a regular basis, they are of limited value where firm targets have not been identified. With only a few exceptions, targets are rarely used. Strategies commonly state that targets are “to be determined”, “have yet to be set”, or “are not appropriate”. Other authors have drawn similar conclusions. McDavitt (2002) observes RLTS preparation is characterised by:

...a failure to monitor implementation paths, a failure to identify performance measures or indicators, and where indicators are identified they are often...not measurable, not surveyed [or] not reported.

Monitoring is also provided for in the Transfund TAP process. Transfund proposes to monitor the implementation of the NLTP and provide feedback and advice to approved organisations on preparing future LTPs. This will involve, amongst other things, auditing packages of integrated proposals where appropriate. Such auditing can, and arguably should, include the assumptions relating to environmental sustainability built into the funding proposal.

Drawing on international best practice, two key functions of monitoring can be identified, namely control and learning.¹⁸ Initial activities centre on checking that the environmental “terms and conditions” of plans are being implemented. At the strategic level, this is a flexible form of tracking, which includes some degree of informal evaluation. Subsequently, a more formal audit of outcomes and review of plan performance and assessment effectiveness may be carried out to document what worked well and what did not. Concepts and measures for this purpose are summarised in Box 5.2.

¹⁷ Notably, neither the legislation nor the Ministry of Transport provide guidance on the content of monitoring reports. Further, the MoT does not evaluate or provide formal feedback on RLTS monitoring reports that are prepared.

¹⁸ Although they are not clearly separable and the emphasis changes from one to the other as the monitoring process unfolds.

Box 5.2 A reference guide to monitoring and evaluation of the effectiveness of assessment

Terms and definitions

Monitoring, audit and evaluation refer to an ex-post review of aspects of SEA effectiveness and performance, focussing on the relationship and contribution of this process to planning or policy-making. Simply stated, *effectiveness* measures whether the process or its elements worked satisfactorily to meet their intended purpose. *Performance* refers to the successful outcome, as measured by a plan or policy that meets its intended objectives or conforms to accepted standards.

Concepts and dimensions

A comprehensive approach to monitoring and evaluation is built on a “triangulation test”, which relates policy, practice and performance (the three Ps). Policy specifies what is required, practice is what actually happens and performance is concerned with the results and the manner of achievement, relating what happened and what was required. A formal audit of outcomes can be undertaken along one or all of three main dimensions:

- *Procedural*: did the SEA process comply with established provisions and principles?
- *Substantive*: did the SEA process meet its purpose and objectives, e.g., support informed decision making (immediate aim) and achieve environmental protection (ultimate aim)?
- *Transactive*: did the SEA process deliver these outcomes efficiently (at least cost and with minimum delay) and equitably (without bias or prejudice to the participants)?

Audit and review principles

The following set of principles provides a framework for a systematic, empirically-based approach to audit and review:

- Specify performance criteria, measures and indicators to be used in evaluating effectiveness.
- Adopt a multiple-perspective approach, canvassing views of participants to gain a full appreciation of process effectiveness.
- Recognise that participants’ views of success are relative and vary with role, affiliation, values and past experience.
- Corroborate these views with data and factual information as far as possible.
- Qualify the issues and challenges in comparison to accepted standards of good practice (e.g., complex problem relatively poorly/well handled in the circumstances).
- Focus on the “art of the possible” when drawing conclusions, contrasting what was accomplished with what realistically could be achieved.
- Identify cost effective improvements that can be implemented immediately, as well as longer term structural changes that may be necessary.

5.8 Summary

Within New Zealand’s transport policy and planning framework there are no formal requirements for SEA. However, components of SEA can be found “threaded through” decision making processes.

The current statutory and administrative arrangements clearly require environmental and social aspects to be assessed in the development of strategies and programmes. The NZTS identifies economic, environmental and social objectives for transport. The Land Transport Management Act restates these objectives and identifies how they are to be taken into account in land transport strategies and programmes. In addition, Transfund's TAP process requires their application to be demonstrated in the formulation of funding requests.

While the current generation of regional strategies show some degree of good SEA practice, there is little to suggest a systematic or comprehensive approach. This is not unexpected as the most explicit requirements for thorough assessment of environmental and social impacts arise from the LTMA, introduced in 2003.

The impetus and requirements for change introduced by the LTMA provide a platform to build on and enhance current instances of good practice. At the national level, the planned strategies relating to freight, rail, cycling and walking provide opportunities for formal SEA application. At the regional level, the preparation of the next generation of RLTS offers similar opportunities.

6. Conclusion and Recommendations

The research undertaken for this report has been guided by three key objectives, namely to:

- Enhance knowledge and understanding of SEA within New Zealand's transport policy community.
- Identify opportunities for the use of SEA in transport policy development.
- Raise awareness of SEA approaches appropriate for use in response to new demands arising from the New Zealand Transport Strategy 2002 and the Land Transport Management Act 2003.

In fulfilling these objectives, the report has been informed by overseas experience of SEA, the current policy and legislative framework for transport planning in New Zealand and an examination of existing practice.

The key findings of the report can be summarised as follows:

1. SEA is used widely internationally to integrate the environment into transport policy and plan-making in support of sustainable development.

A growing body of experience is available from Europe and North America on the use of SEA in transport planning. It encompasses different forms of SEA, ranging from formal, legally prescribed procedures to more informal, flexible approaches.

A review of international developments and recent trends provides a number of key lessons of SEA practice relevant to considerations of whether and how such an approach may be applied in New Zealand.

The International Association of Impact Assessment (IAIA, 2002) has defined an effective or good quality 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 EIA at the project level.

In exploring opportunities to adapt SEA approaches to New Zealand, there are a number of key rules of SEA good practice that can provide guidance. These rules can be summarised as follows:

- Begin as early as practicable in the process of policy or plan formulation.
- Keep in mind the purpose of SEA is to inform decisions not to produce a study.
- Make sure the scope of SEA corresponds to the potential environmental effects of the proposal under review.
- Focus on the comparison of major alternatives.

- Look to gain environmental benefits as well as avoid adverse impacts.
- Use the simplest procedures and methods consistent with the task.
- Provide the right information, at the right time for decision making.
- Follow through to implementation and evaluate outcomes.
- Build professional capacity and strengthen process and procedures based on lessons of experience.

2. SEA is best seen as a family of approaches that can be tailored to purpose and context.

Within the international literature, two main alternative SEA frameworks can be identified and contrasted. These are “SEA of” versus “SEA within” approaches.

The more formal procedure for undertaking “SEA of” a strategy or plan ensures that the environmental (+/- social) aspects are the principal focus and concern of the study. However, this approach often focuses on the impact of implementing a draft plan and it may not influence major decisions on alternatives because it takes place relatively late in the strategy preparation.

In contrast, the “SEA within” process has greater potential to influence planning and decision making but a less explicit mandate and a less well defined role relative to transport planning. Accordingly, it may not be clear whether or how environmental and social considerations have been taken into account.

In the New Zealand transport setting, a key point to emphasise is that SEA is context specific. The term “fit-for-purpose” is used to express the principle that the SEA process should be customised to the context and characteristics of policy and plan making.

3. To date, SEA has not been formally applied to planning in transport or other sectors in New Zealand.

In general, environmental impact assessment in New Zealand has been restricted primarily to identifying the impacts of specific projects and, in particular, to assessments of environmental effects (AEEs) under the RMA. The Act also requires a limited form of SEA when resource management policies and plans are being developed (section 32). However, the use of tools to assess the environmental impact of policy and planning decisions is not well advanced.

Despite the lack of experience, opportunities can be identified within the policy and legislative framework for transport planning to develop a more systematic approach to SEA. These opportunities represent entry points for a style of SEA within or “threaded through” the planning process.

4. New Zealand's statutory and administrative arrangements clearly require environmental and social aspects to be appropriately assessed in the development of transport policies and strategies.

Both the NZTS and the LTMA incorporate the concept of sustainability and provide specific recognition of the need to address the environmental and social effects associated with transport. Reflecting the purpose of the LTMA, Transfund's TAP process has also strengthened the requirements for assessment of environmental and social impacts.

The NZTS has broadened significantly the transport planning horizon away its previous narrow focus on road building and maintenance and signalled a new policy direction encompassing sustainability. Key objectives underpinning the NZTS include protecting and promoting public health and ensuring environmental sustainability.

The LTMA reflects and restates the objectives of the NZTS. The Act introduces new responsibilities for ensuring the environmental and social aspects of land transport funding, planning and management are considered and taken into account.

The Act also incorporates several key principles which coincide with those of good SEA practice. These principles are expressed in the requirements for transport agencies to:

- Ensure early and full consideration of land transport options and alternatives.
- Provide early and full opportunities for public participation.
- Avoid adverse environmental effects.

Collectively, the increased focus on environmental and social factors signalled in the NZTS and the legislative changes included in the LTMA strengthen the obligations on transport planning agencies to more systemically analyse and evaluate issues relevant to sustainability.

From an SEA perspective, the new arrangements provide both an imperative for a strategic approach and a platform on which to build formal SEA application.

5. The processes and requirements of the current policy and legislative framework includes a number of opportunities and entry points for the use of SEA, which could be exploited to improve and strengthen the delivery of transport strategies and programmes.

In identifying opportunities for the use of SEA, it is important to recognise that the principles and steps of SEA are or should be provided for in a good planning process. In large part, the component steps of SEA mirror the steps that could be expected to occur in good quality planning. This can mean it is not always clear where SEA ends and planning begins.

However, SEA has the potential to make a distinctive contribution to transport policy and plan making because it provides a means of giving explicit consideration to environmental

impacts and sustainability issues. A key distinction of SEA is that it focuses attention on the environment and highlights the fundamental importance of environmental sustainability.

At the national level, there are opportunities to employ SEA approaches in the preparation of national strategies. The LTMA makes provision for a national land transport strategy to be prepared by the Minister of Transport. While the preparation of the strategy is optional and subject to the Minister's discretion, SEA could provide a valuable means of informing its development if a decision was made to proceed.

Opportunities also exist to employ SEA in the preparation of strategies currently being developed by the Ministry of Transport on specific aspects of land transport (e.g., freight, rail, cycling and walking). For example, in identifying priorities for action within these strategies, SEA could assist by assessing the anticipated changes in emission levels resulting from improvements in public transport compared with policies that directly discourage car use.

Similarly, at the regional level SEA could make a significant contribution to the preparation of RLTS. The LTMA has introduced specific requirements for RLTS to take into account how they contribute to environmental sustainability. The application of SEA to the next generation of RLTS could assist in fulfilling these requirements.

The adaptation of SEA lessons of good practice to the local context will be a critical basis for moving forward. The elements identified in section 3.5.1 provide a useful starting point for evaluating current SEA practice within RLTS preparation and in identifying gaps or weaknesses. These elements are:

- **Information requirements**
More work is required to provide basic information on environmental and social impacts. Available information is often limited in quantity or of poor quality, impacting on the quality of the decision making process.
- **Identification and consideration of alternatives**
Consideration of alternatives is a key component of SEA. More explicit requirements to consider alternatives and options have now been introduced with the passage of the LTMA. Current practice shows challenges remain in this area.
- **Selection of issues and indicators**
To date, there has been a lack of coordinated work in the area of indicators. In the more comprehensive RLTS, performance indicators have been developed and targets set. In general, however, targets are rarely used. Where indicators are identified, they tend to be selected due to the fact there are existing information sources rather than that the indicator is the most useful or relevant for the purpose.
- **Impact analysis**

In many cases, the tools used for impact analysis in the New Zealand transport sector are simplistic. While this may have some advantages in terms of ease of use, it also means the resulting analysis may not be sufficiently comprehensive to provide meaningful information upon which to base decisions.

- Reporting

Reporting is an important area and one that is not always done well. Attention needs to be given to identifying effective methods to standardise reporting procedures. The quality of reporting will also be influenced by the selection and consistent measurement of performance indicators.

6. Pilot and demonstration projects in the application of SEA to RLTSs offer the most appropriate way forward for adapting SEA to the New Zealand transport sector.

The research carried out for this report has identified the RLTS preparation process as a potential key entry point for SEA in New Zealand's transport planning framework. The legislative requirements for preparing RLTSs provide three key elements of effective SEA, namely:

- The sustainability focus of the process required,
- The requirements for early and full consideration of alternatives,
- The requirements for early and full opportunities for public participation.

An examination of the current practice of preparing RLTSs shows some key similarities with SEA in the process steps employed. This is illustrated in Table 5.1 in the previous section of this report. However, while there is some evidence of good SEA practice within RLTS preparation there is little to suggest a systematic or comprehensive approach.

The new requirements of the LTMA provide a platform to build on and enhance current instances of good practice. The preparation of the next generation of RLTSs offers opportunities for greater integration of SEA.

To explore the potential to integrate SEA methods and techniques into RLTS development, further research is recommended. The key objectives of this research should be to:

- Identify cost effective and practical opportunities for SEA use in the regional land transport strategy preparation process.
- Assist regional councils and Transfund to meet the new requirements of the Land Transport Management Act.
- Contribute to the delivery of the sustainability direction of the NZTS and the LTMA.

The information and analysis set out in this research report provides useful guidance for the design of any further research. More generally, it should also provide the transport policy community with options for adapting SEA to meet the requirements of the new legislative environment.

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