

# **Transportation corridors and community structures**

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# Acknowledgements

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We have appreciated the patient support of the NZTA management which has over six years enabled this review to be undertaken. We hope the result will prove of value as a basis for regional and city planners and their transportation planning colleagues to more confidently contribute to improve strategic urban planning and the development of future multi-function transportation corridors.

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# Executive summary

This report includes some history and a broad overview of the legislation, and institutional and professional arrangements related to the regional significance of developing transportation corridors. This is an evolving area of policy and planning and the report seeks their integration with open space and other community structures in planning for future regional development.

Chapter 1 defines the term 'transportation corridor' for the purposes of this research. After establishing the research objectives there is an introduction to the nature of integrated corridor planning and a summation of the planning philosophy underlying corridor planning as part of future regional and transportation planning.

In Chapter 2 there is a brief literature review. It includes a commentary on 10 recent NZ Transport Agency (NZTA) research reports published since 2006, which have relevance to this corridor planning research project. An historic and more comprehensive list of reference material is included in chapter 10: References.

Chapter 3 gives a brief overview of the existing institutional arrangements including the Land Transport Management Act 2003, the role of the NZTA and regional and city/district councils. The research focused on the regional need for systematic selection of existing and future corridors as part of regional land transport strategy planning. The protection of corridors is essentially shared between the NZTA, regional, city and district councils, and statutory plans. The research identified the importance of regional leadership, in one form or another, as a pre-requisite for success with planning future major regional transportation corridors.

Chapter 4 considers arterial road management including statutory provisions for limited access roads. Having a supporting network of urban and rural arterial routes is essential. Historically these have been put in place first, with the major motorway and expressway facilities coming later by way of traffic relief. The arterial road functions of collection, distribution and service to their abutting localities are vital and some require enhancement and access protection.

Chapter 5 summarises the nature of the issues necessary for effective future motorway major transportation corridors. This applies to multi-modal as well as single-mode projects and includes a consideration of zoning and open-space provisions, and the width and location of both existing and future corridors.

Chapter 6 considers regional characteristics and the need for long-term commitment to the implementation of major corridor projects. It confirms the importance of the roads of national significance as a means of ensuring the most important corridors are adequately funded directly from central government.

Chapter 7 identifies the criteria used to select the 24 projects which would be assessed for this research. The projects have been grouped according to their contribution to community structures, reinforcing open-space corridors and their potential for transportation future proofing. They were then ranked as to their potential for future proofing and environmental sustainability. These assessments are summarised in appendix E and described in appendix F.

Chapter 8 considers the issues surrounding property purchase and designations along with the need for legislation amendment and a greater emphasis on regional strategic involvement. It also makes a plea for earlier property purchase by regional councils as planning authorities. To assist in achieving this for longer-term proposals (over 10 years), we recommend district plans include a new style of 'corridor protection zone'.

Chapter 9 summarises the research conclusions and identifies the key issues that need to be considered and addressed. These include more strategic planning for multi-purpose transportation corridors along with greater collaboration between agencies and more leadership provided by regional planning authorities. We conclude with the need for early property purchase, typically 10 to 30 years, ahead of construction and this initial purchase should, in our view, be made a local government planning responsibility.

The report contains four specific recommendations:

- 1 Introduce 'corridor protection zones' for earlier protection in district plans.
- 2 Amend the Resource Management Act's 'designation' provisions.
- 3 Make early corridor purchase a council responsibility as planning authorities.
- 4 Introduce access management structure plans for key lengths of major arterials.

The recommendations are framed to assist more successful integrated planning of transportation corridors and open-space community structures. This will involve professionals and politicians in national, regional and district planning to support and improve future corridor planning.

## Abstract

This research gives a regional planning and strategic perspective of some New Zealand experience in creating transportation corridors and community structures from a planning perspective. For major urban areas, future open space corridors and multi-mode transportation corridors are complementary and can economically provide a fundamental framework for urban development. The past processes have typically left the purchase of these open spaces to each special purpose agency and also until too late in the chain of strategic planning, to secure sufficient corridors and shared open space. Early and confident identification of these corridors leads to economy and efficiency in urban development. It also reinforces their combined contribution to sustainable community structures, long-term coherent urban form and to a flexible and future-proofed transportation system.

The report includes recommendations relating to corridor protection zones, designations, early corridor land purchase and arterial access management structure plans. These are proposed to assist with future corridor planning.



# 1 Introduction

## 1.1 Project brief and intentions

Given that the identification of future major long-term land transport corridors for all modes of travel is essential for successful strategic planning, the development of a framework for an integrated regional urban growth pattern and a sustainable transport system, the objectives of this research project were to:

- 1 Identify the potential for multi-purpose regional land transport corridors so as to provide a framework for strategies that support both sustainable multi-modal transportation and environmentally improved community structures.
- 2 Study selected existing and proposed regional transportation corridors and endeavour to identify the key elements necessary to their future ability to match criteria for transportation and environmental sustainability.
- 3 Consider the present institutional structures and statutory provisions for integrated planning of existing and future networks and regional transportation corridors.
- 4 Identify any impediments that may need to be addressed so as to enable good practice in planning major regional 'transport corridors' and the associated 'community structures' within New Zealand's present institutional planning arrangements.

The original proposal was to prepare a set of 'guidelines' for transportation corridor planning. However, that objective was set aside as being a detailed task which would have to follow an understanding of the issues and organisations involved in 'transportation corridor planning' and an assessment of any existing impediments. Since the project was initiated there have also been several legislative and considerable institutional changes, including the creation of the NZ Transport Agency (NZTA) and the formation of the Auckland Council. This research report is comprehensive, providing an overview and some history of institutions, legislation and planning practice relevant to selecting and managing major transportation corridors in New Zealand. It is primarily related to long-term planning for future facilities and the space and land-use management required to meet satisfactory environmental standards. However, it has also included the need for future proofing of existing and proposed transportation corridors and their relationship to adjacent urban land uses and community structures.

From the outset the research posed the question: 'In the last 50 years why have so many excellent opportunities been squandered or lost?'

## 1.2 Relevant key topic areas

The identification of existing and future major transportation corridors is fundamental to regional planning, urban form, urban development and reducing the adverse effects of transport on the urban and rural environment. The Land Transport Act 1998, the Land Transport Management Act 2003 (LTMA 2003) and the Land Transport Management Amendment Act 2004 established the principles of sustainability for transport and provided a framework which could contemplate planning and development of multi-purpose transportation corridors.

The comprehensive nature of corridor planning and the variety of issues affected led to this project being relevant to land transport management on several counts:

- **To improve the (long-term) sustainability of the land transport network**
  - interaction between land use and transport, improved fuel efficiency
  - improved community quality of life, integrated development processes
  - network optimisation
- **To mitigate the (long-term) adverse impacts of land transport**
  - understanding the impacts – levels of acceptable environmental impacts
  - social severance, visual impacts, long-term impacts on flora and fauna
- **To more efficiently and safely manage the movement of vehicles**
  - reducing the adverse environmental effects of traffic flows in a network.

It is recognised in the field of regional planning that in addition to direct measurable transportation benefits resulting from higher standards of corridor development, there are other benefits brought to the surrounding urban systems, urban economy and urban structures. The non-user benefits include:

- reduced traffic flows on adjacent (previously overloaded) arterial and collector roads
- reduced adverse environmental effects in the adjacent suburban areas
- increased quality and stability of the adjacent communities
- the opportunity for directing development and redevelopment of the adjacent urban areas
- potential for a variety of infrastructure and multi-modal facilities to take advantage of the multi-purpose open-space corridors.

These wider benefits are permanent and ongoing, and add to the future suburban qualities for the years ahead. This underlines the need to consider 'transport corridors and community structures' as one system of regional planning of multi-modal urban transport and urban form so as to secure the future regional urban growth strategy.

The initiation of effective corridors at all three levels (arterials, single transport mode corridors and multi-transportation mode corridors) is one method of providing a framework matching the purposes of the Resource Management Act 1991 (RMA) This will result in an improved urban environment and better urban design outcomes. A quality multi-modal corridor can be a significant contributor to enabling metropolitan sustainability.

Such transport corridors are of both national and regional significance and take a long time (30 years or more) to achieve. They require a sustained effort and leadership by government at all levels, and by all professionals involved to secure their implementation. Such long-term effort is justified, however, in that it is a key element in achieving the 'safe, integrated, responsive and sustainable' outcomes sought by the objectives of the regional land transport strategies (RLTSs) prepared under the Land Transport Act 1998 and the LTMA 2003 as well as by the regional objectives contained in regional policies and plans prepared under the RMA.

## 1.3 Historic background

Historically since the colonial planning of New Zealand cities, the need for clear grid type and/or ring radial street patterns was understood in pioneering the establishment, subdivision and development of our towns and cities (eg the four avenues and the 'grid' of Christchurch, or the 'radials' of the Great

North, Dominion, Mt Eden, Great South and Remuera roads in Auckland, or the Hamilton and the Palmerston North 'grids') all served the initial subdivision and development patterns well. However, in the past 50 years major urban growth, combined with a four-fold increase in mobility and vehicle traffic, has meant the traditional subdivision with its multi-purpose at-grade street pattern, cannot possibly meet the needs by relying on conventional two-way, two-lane roads. The traditional subdivision networks have neither the capacity nor the safety for communities of over 100,000 inhabitants. Above that number it is necessary for a pattern of major traffic corridors and urban rooms to be developed so they overlay the traditional land use and street system with key corridors that have restricted access and key intersections that are grade separated. This framework for development has been well understood since the 1950s.

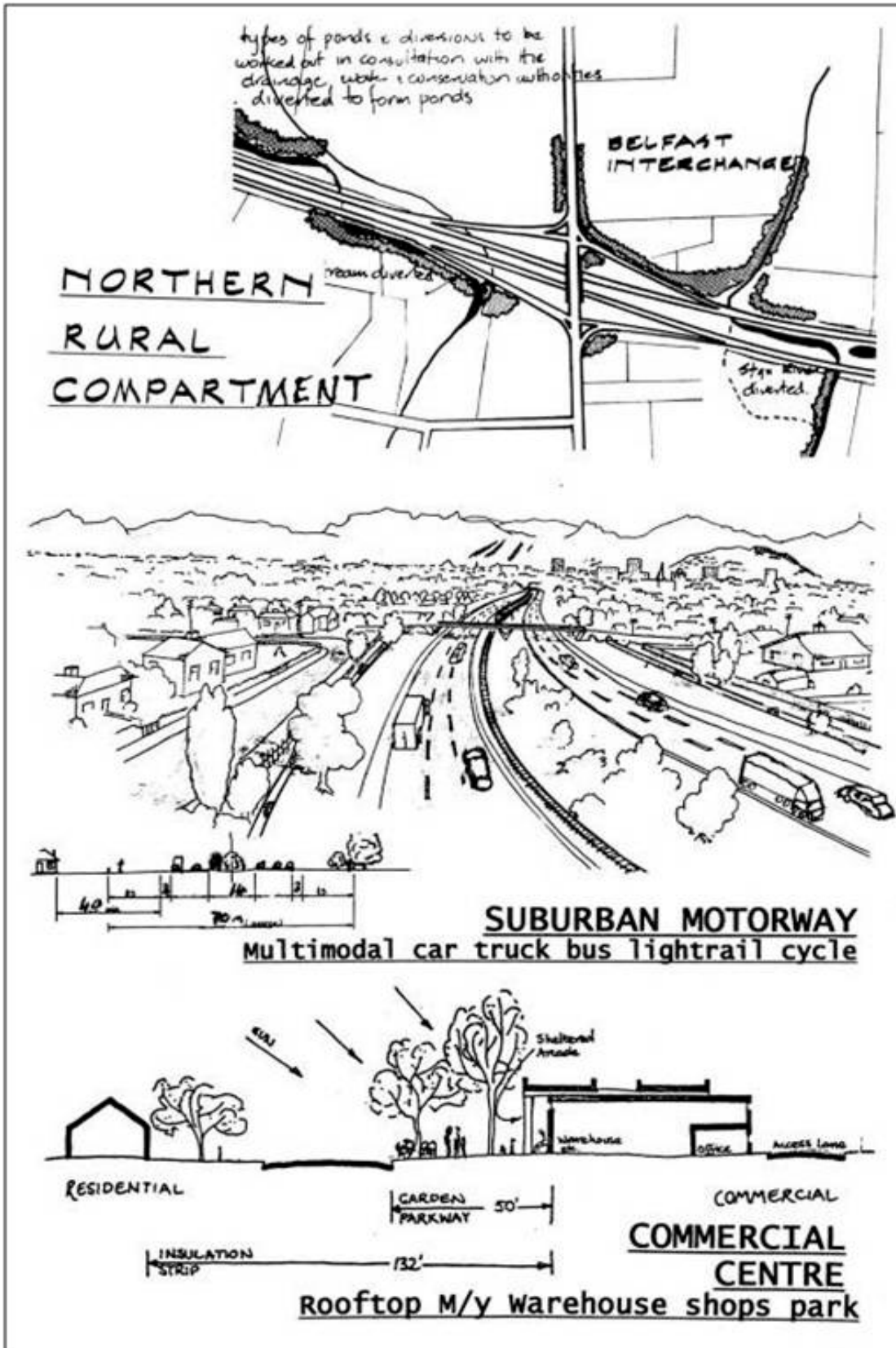
Over the past 50 years a considerable political, professional and technical resource has been applied to undertaking regional and local comprehensive transportation studies to establish the needs and define some major corridors in our seven larger metropolitan areas. In spite of good technical evidence, careful projections, successful assignment models and deficiency analyses, the proposed solutions have frequently been rejected, deferred or abandoned. How is this! Largely because of a lack of acceptance of the principle of 'corridors and rooms' at the regional planning level, also a lack of commitment within the several professions involved and the absence of integration between the three political levels of government (national, regional and local). The effects of national and local body politics, with their three-year election cycle, also contribute to an attitude of indifference toward successful corridor planning.

Latterly, with increasing congestion and obvious overloading of the local arterial street systems, there has been some revival of support for major new transport corridors involving pre-purchase of land for new road reserves and solutions that include access control, bypass roads and grade-separated transport facilities. Most obviously the early construction of future corridors has been repeatedly postponed because of lack of funding. It seems our recent past has been strewn with the 'wrecks' of major corridor proposals that have been either abandoned or endlessly delayed, eg the Eastern Motorway in Auckland, the second Te Aro tunnel in Wellington and the St Albans Motorway in Christchurch, to mention a few included in this study.

Like the state highway system itself, the corridors being considered here are of a different 'character' to the ordinary arterial streets and local roads. They must be identified and funded by a 'roads of regional significance' type separate block funding. The property fund will need to include national funding to support national 'transportation' responsibility and also a contribution from local government planning budgets to contribute and reflect the 'community structures' portion of the benefits. For a multi-modal facility with rail, the rail transport contribution must also be considered.

In New Zealand there has been a reliance on single purpose transport entities such as Transit NZ (now the NZTA) and councils as road controlling authorities, to be the initiators and funders of the proposals. This in turn has resulted in transport projects sometimes being undertaken in isolation from the planning for other community land-use and utility services. The Greater Christchurch Urban Development Strategy, the Queenstown Strategy Plan, the Western Bay of Plenty Smartgrowth studies brought collective resources together during their preparation. However, three years later the joint effort began to fade in the absence of an effective ongoing and stable regional plan and regional leadership. The result at both national and regional levels continues to be the absence of support for long-term 30 or 50-year planning, and lost opportunities. Such integration and leadership is essential to planning a sustainable urban form transport system, as well as multi-purpose transportation corridors.

Figure 1.1 Motorway corridor opportunities



Source: CRPA landscape studies (Tunnard 1969)

The reader will not be surprised to discover that in 1970 at the government-sponsored Physical Environment Conference, as part of the National Development Conferences, the following sensible and integrating recommendations for action were adopted (McMahon 1972) as a statement of national interest.

*Research into the following specific topics is recommended:*

- 1 *Methods of financing the acquisition of land for transport proposals.*
- 2 *Relative social and economic costs and benefits in avoiding congestion rather than belatedly trying to remove it.*
- 3 *Extension of cost-benefit techniques to establish urban road priorities on networks of different qualities.*
- 4 *Attempts to make comparisons between different modes of transport for respective levels of service.*
- 5 *Traffic generation characteristics of different land uses.*

*And also that all planning authorities:*

- 6 *Be urged to ensure that their schemes (district plans) recognise the hierarchy of road types and the importance of strict control of land uses fronting the major or arterial roads.*
- 7 *Guard against the adverse effects, both visual and audible, arising from major traffic roads on the adjacent land uses.*
- 8 *Endeavour – through the ordinances (rules) as well as requirements in design and landscaping – to retain the amenity of both major roads and adjacent development.*
- 9 *Do more towards retaining the character of the ‘townscape’ and the ‘landscape’ through which new roads and streets pass.*

While there has been much activity since 1970 on some of these matters, eg item 3 ‘cost-benefit’ assessments, the other areas have been ignored or addressed in an uneven manner and they are still not fully integrated into everyday practice or treated as areas subject to national standards. It is to be hoped that both government and regional and local government policies will improve in all these areas. Since the introduction of long-term council community plans (LTCCPs) in 2002, and the passing of the LTMA 2003 there does appear to be more focus on integrated planning for sustainability in transportation. Some cooperation for existing planned facilities is evident but not at the higher standard needed to match future environmental, traffic or community standards for ‘future proofing’ and ‘sustainable urban form’ which takes the scheme planning up another whole threshold. Without this effort, opportunities will continue to be lost.

The comprehensive longer-term planning for both suburban and rural transportation corridors is a positive example of integrated planning which embraces all these matters so as to provide a sustainable transportation future. In principle, this has been accepted for many years as nationally important. But despite the best will in the world these forward plans have been frustrated by a lack of local government leadership with good forward planning, a lack of early property purchase, stop and go political pressures and ultimately a lack of national and regional funding to ensure earlier purchase and timely construction of these essential corridors ahead of demand.

## 1.4 Definition of transportation corridors

The term 'transportation corridor' has varying meanings for different people. To a road manager it may reflect the minimum width for the travelled way, to the district engineer it will be the total reserve width, or to the planner it can include the swathe of land abutting the transport link and embracing those properties affected by, and in the 'footprint' of, the transport facility and the associated property accesses, as described by Hans Westerman (1988). An even wider strategic and economic concept includes consideration of the 'corridor of development' associated with economic activities resulting from major urban development patterns lying alongside and parallel with such a transportation corridor as described by John Black (2003).

In our research we considered major multi-purpose transport corridors, major single purpose corridors and major arterial road corridors. This research and its recommendations are related mostly to suburban and inner rural motorways and arterial road corridors. Even in large metropolitan centres (eg Auckland, Wellington and Christchurch) it is not expected that the percentage of such major corridors would represent more than about 5% – 7% of the total length of the road network. This is, however, the critical length, which if planned successfully will enable a sustainable transportation system that can be maintained, and upgraded in the future, to provide a safe, effective, economic and attractive environment in the major urban areas of New Zealand.

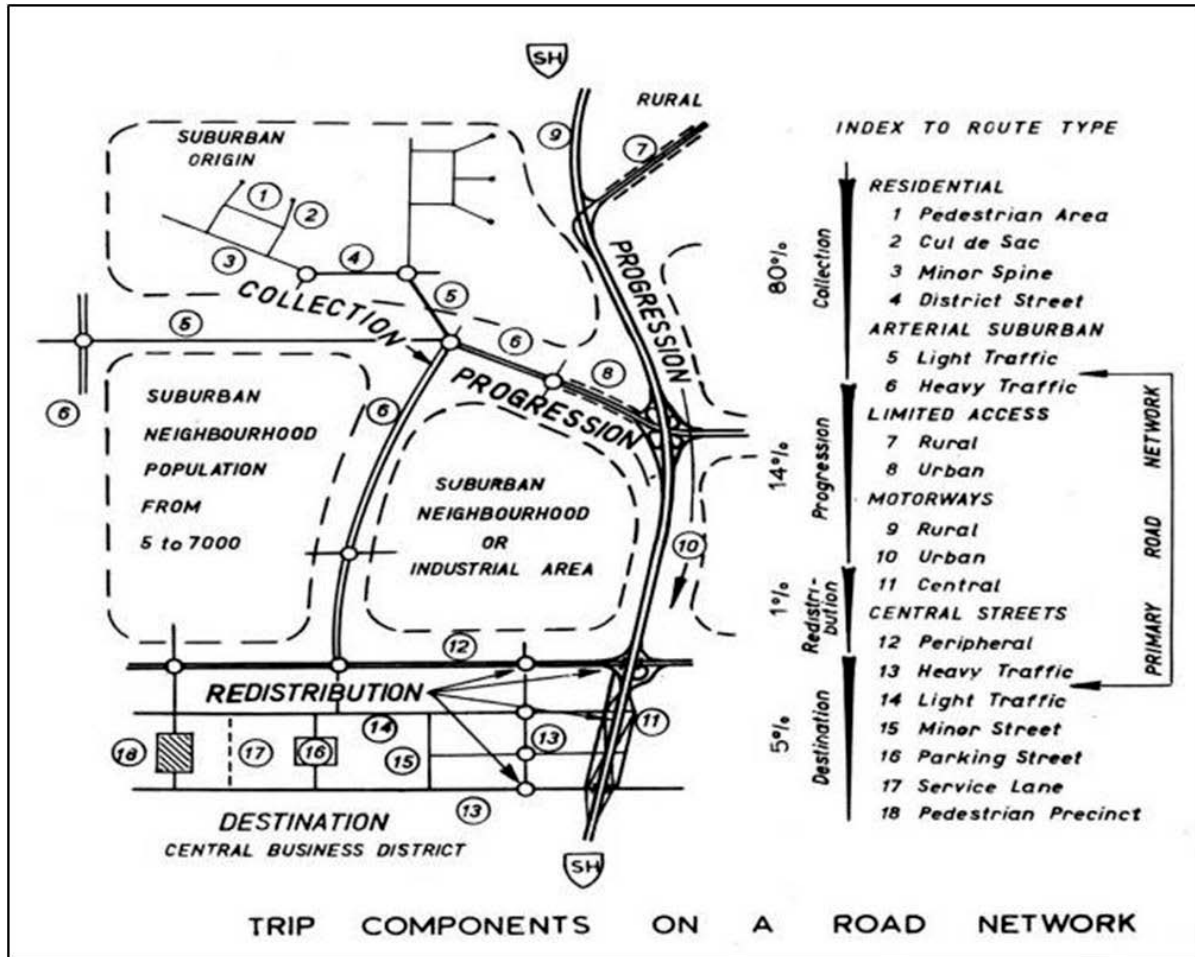
In this research the 'corridor' is a tract of land which can be considered comprehensively and planned for open space, transport, environmental and public amenity and abutting land uses in an integrated manner. Here the transportation corridor includes the following three elements:

- 1 The 'immediate right-of-way' space required for the transport facilities for a 20-year planned transportation infrastructure, the associated engineering, landscaping and operational services. This is the minimum area essential to the transport agency's needs.
- 2 The 'margin for future proofing' space adds an additional width to the corridor so as to meet longer-term transport needs (30 years or more) to match the likely growth and change in modes of travel in the corridor. This may include additional lanes, high-occupancy lanes, bus ways, rail track and any space for duplication of these and any other modes. In addition, the corridor should be able to accommodate extended landscape provisions sufficient to insulate neighbours from the adverse effects of the corridor's transport activities.
- 3 Third, 'the environment footprint' which extends beyond 1 and 2 and includes the land and land uses of the adjacent property which may be particularly affected by the transport facility, ie the buffer area outside 1 and 2 above. This area is needed to accommodate other activities such as public authority infrastructure, water management, recreational areas, public open space including that required for significant environmental landscape, alternative accesses to the location of community activities, and other land uses and urban development that could be materially affected by 'reverse sensitivity' effects such as noise, lights, fumes and visual intrusion caused by the existing and possible future transport corridor activities.

For urban arterial roads, Westerman (2003) has described the third element as 'the land use environment footprint'. In the case of motorways and new limited access expressways the third category should ensure that in practice, any abutting urban activity or development (eg houses, schools and industry) should be set back behind a line where 'they will not be adversely affected by the intensive use of the transport corridor'. This would apply to all environmental effects including noise, lights, pollution, visual intrusion and awareness of the disturbance of intense volumes of passing traffic.

These elements and their definition are encompassed in figures 1.1, 1.2 and 1.3. The transport corridors considered here are more than a service for travel. They provide a 'mental map' of the region, images of open space, potential for landscape excellence, opportunity for multi-modal facilities and above all a means of environmental enhancement that mitigates any adverse effects.

Figure 1.2 Urban road hierarchy and road types



Source: *Traffic planning and the functions of a road network* (Douglass 1966)

Figure 1.3 Levels and types of corridor planning

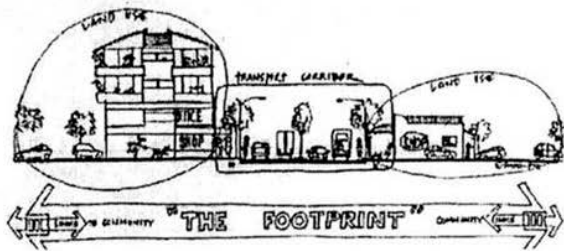
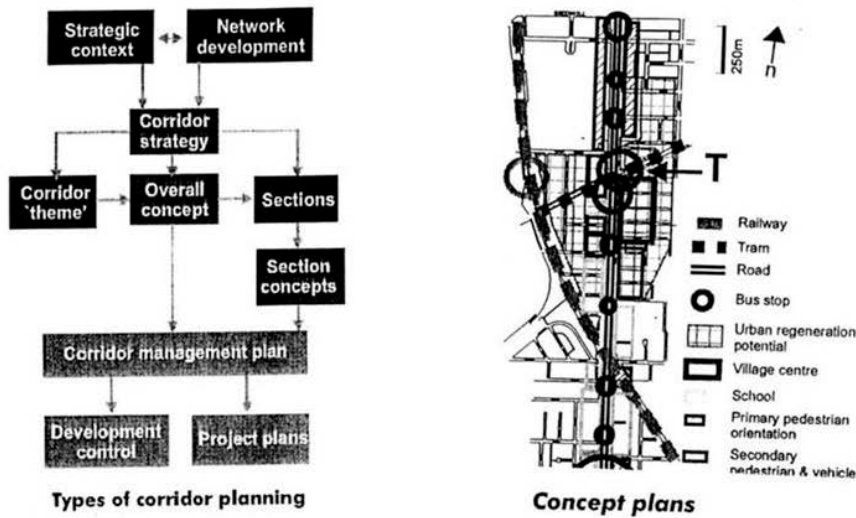
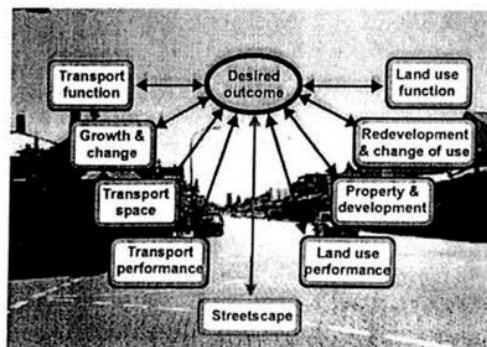


Illustration of the idea of a 'footprint' (source, Unley Council, 2002)



Nine groups of performance criteria

Source: *An introduction to integrated corridor planning* (Westerman 2003)

The 'mental map' referred to embraces the whole network and includes each element or link traversed in travelling around the metropolitan area. The different components in the network including the 'collection', 'progression' followed by the congested 're-distribution', and 'destination' phases are illustrated in the diagram of an easily recognised network map in figure 1.2 (Douglass 1966).

A typical urban transportation and motorway corridor is illustrated in figure 1.4. The corridor right-of-way width will vary from 70m to over 100m, depending on the range of the median width, vehicle lands, bus



lanes, bus ways, light and heavy rail facilities together with outer areas for cycleways, walkways, open space and landscaping.

The fundamental importance of the road hierarchy was emphasised by Colin Buchanan in 1966 when he assured the Christchurch City Council:

*The essence of the problem is to establish a hierarchy of networks related to different situations within each part of the metropolitan region. Such a hierarchy would guarantee the exclusive rights of individual links to have different types of movement and different levels of activity from pedestrian areas through to high speed rapid transit corridors.*

It is necessary to recognise the different road types and the balance of traffic and community functions. These relationships are well recognised by Austroads and described on the NZTA website [www.nzta.govt.nz/planning/process/integrated/index.html](http://www.nzta.govt.nz/planning/process/integrated/index.html). Briefly roads serve their dual roles of providing 'link' functions of varying traffic standards while also serving varying community and 'place' functions. In the context of this research the major corridors have a primary traffic function with a complementary amenity, landscape and environmental role within the regional community structure.

The adjacent land uses, the variety of appropriate space and yards that provide suitable urban design, civic architectural treatment and community design and layout must also be considered from the outset. These are key elements that lead to a coherent, safe, convenient, visually attractive and an exciting community. Thus the identification of transportation corridors is a high level of strategic framework for planning community structures. This is fundamental to metropolitan and regional planning. These relationships include the identification of 'corridors' and 'rooms' which were espoused in *Traffic in towns* (Buchanan 1963). These basic concepts are illustrated in figure 1.5.

The major transportation corridors may be multi-modal with appropriate space allocated to meet the needs of all modes sharing the corridor over a 50-year time frame. They can include motorway, rail public transport, bus ways, parallel high occupancy vehicle (HOV) and express lanes. In some cases on open land adjacent there would be facilities for cyclists, pedestrians, water areas and other infrastructure could also be provided.

**Figure 1.4** Typical suburban motorway and multi-modal corridor

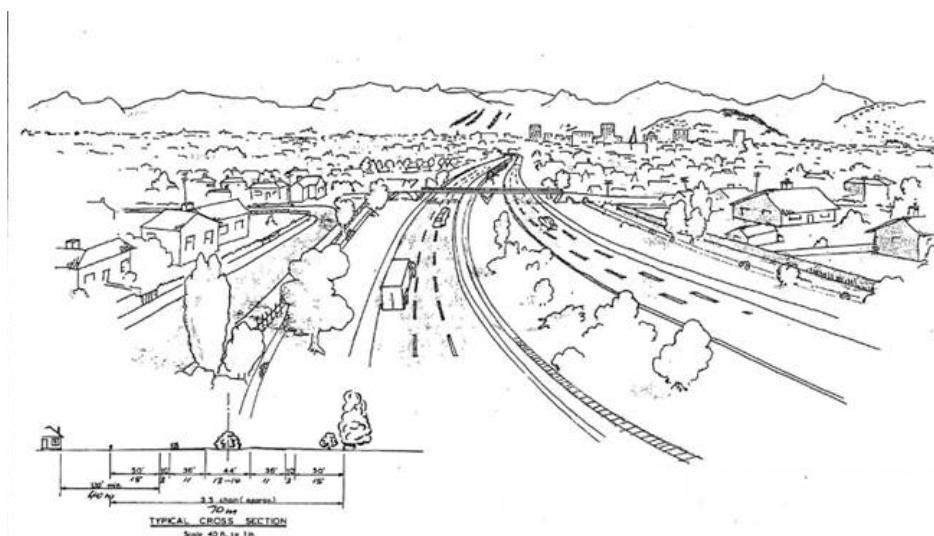
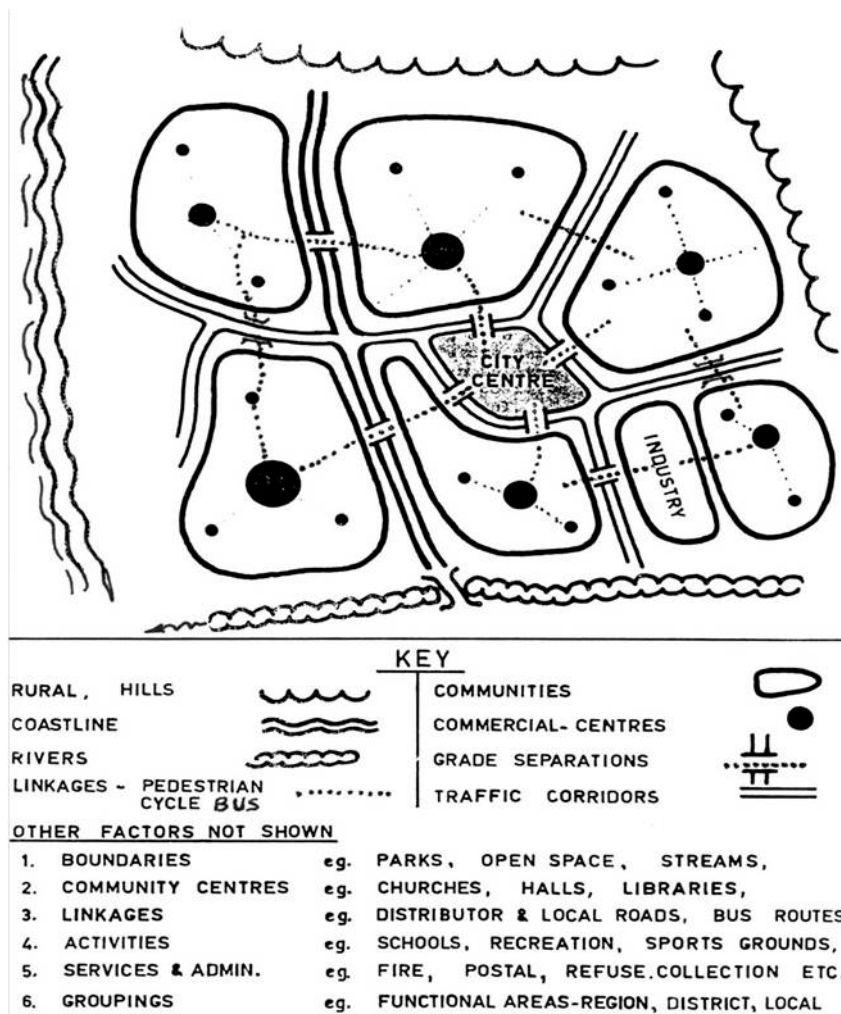


Figure 1.5 Rooms and corridors and linkages



Source: CRPA (1975)

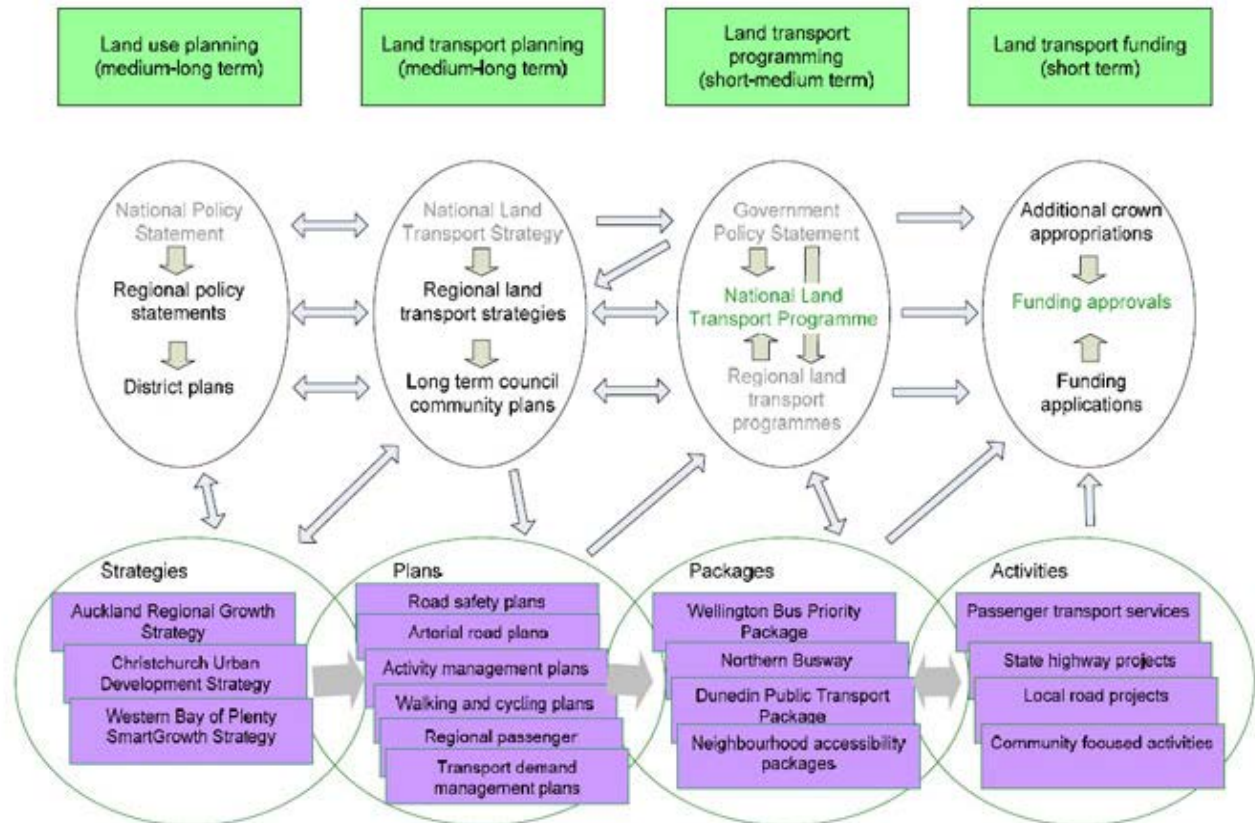
## 1.5 Integrated corridor planning

For significant strategic transportation network and regional land-use investigations, in addition to good highway design, traffic modelling and economic studies, there is a need for integrated inter-agency and multi-disciplinary planning assessment and objectives underlying the corridor proposal. This not only involves the design of a specific project but also a continuing collaborative and integrated approach by all agencies in transportation, network, land use, regional strategic planning and district community planning involved in the proposal. Successive organisation and staff changes in the public institutions involved, as well as the approval processes, appear to militate against traditional less formal cooperative arrangements. A much more structured and careful record of exchanges at each stage is now required.

The integrated planning process is ongoing over time and between all the agencies and this is illustrated in figure 1.6 which is taken from the NZTA website ([www.nzta.govt.nz/planning/process/integrated](http://www.nzta.govt.nz/planning/process/integrated)). It identifies the contribution of regional and district plans under the RMA, the regional land transport strategies (RLTSs) under the LTMA 2003, the National Land Transport Programme and the funding approval process. Here also the respective roles of strategies, plans, packages and activities are

recognised. Major corridors discussed here must be initiated at the early ‘strategic regional planning’ stage. The Government Policy Statement on Transport Funding (GPS) also confirms that ‘integrated planning’ is a key factor in ensuring New Zealand develops a land transport system that achieves its short-to-medium term objectives.

**Figure 1.6 Integration of land-use and transport plans (NZTA)**



The diagram summarises how the NZTA sees integrated planning working. In terms of this research the following schedule identifies the key factors of integrated and comprehensive planning.

Integration results from interdisciplinary and inter-agency collaboration over time:

- strategic planning: long term 30 to 50 years
- scheme planning: medium term 20 to 30 years
- project planning: short term 10 to 20 years
- implementation planning: immediate term 1 to 10 years.

Integrated planning should reconcile the following five high-level relationships of:

- the relationships between urban form, growth strategies and the development of urban rooms between the corridors of the major transportation systems
- the relationship between transport routes and land uses abutting their corridors
- the relationship between transport functions within the corridor and the spaces provided for vehicles, public transport, active modes and safe areas in the landscape design within and adjacent to the corridor

- the relationship and accessibility between regional network links and local networks, while enabling suburbs to be accessible but at the same time free from extraneous traffic
- the relationship of the corridor's 'footprint' of effects on the land both within and beyond the transport right of way.

Integrated management and implementation involves collaboration and planning assessments at the national, regional, district and neighbourhood levels.

The NZTA has stated its intentions of working in partnership with local authorities, to ensure compatible and sustainable land-use planning affecting state highway corridors and achieving greater integration of high-level planning for transport and land use. The NZTA, and the regional and the district planning authorities, must ensure such integration is a way of life and a pre-requisite to the preparation of proposals especially for major transportation corridors.

Table 1.1 is a generalised chart of a transport improvement assessment matrix as a check list of the wider and multi-level objectives to be considered and achieved, and the range of issues to be assessed for alternative options and ensuring integration at the national, regional and district levels (Douglass 1993). It is not possible to arrive at a precise cost or numerical comparison for all of these issues on a strict cost-benefit basis. The engineering, planning and community analysts in the future must create a 'planning balance sheet', which will highlight the relevant issues that match the higher-level community, environmental and transportation strategies. This applies particularly to the strategy of selecting and developing multi-purpose transportation corridors.

Table 1.1 Transport improvement assessment matrix

Description of option									
Note - comment in space always fill change + / 0 / -	National objectives		Regional objectives		District objectives		Overall change		
							Gain	Neutral	Loss
<b>Assessment criteria</b>									
<b>1 Long-term strategies</b>									
a) Part of required growth strategy									
b) Desirable future options kept open									
c) Timing leads or follows traffic need									
<b>2 Transport</b>									
a) Balance of travel by each mode									
b) Traffic assignment balance									
c) Levels of service for road & mode									
d) Relief to existing networks.									
e) Travel convenience to users									
<b>3 Economic</b>									
a) Benefit cost/for transport users									
b) Community-wide benefit/costs									
c) Strategic econ and sustainability									
<b>4 Environmental gains/losses</b>									
a) Urban form, rural quality effects									
b) Landscape and visual quality									
c) Community-wide envir. effects									
d) Immediate locality									
e) Tangata whenua/heritage									
<b>5 Energy use</b>									
a) Total energy for each veh mode									
b) Change in energy use + or -									
<b>6 Pollution/carbon dioxide</b>									
a) Total for each vehicle mode									
b) Changes compared to present									
<b>7 Community development</b>									
a) Safety to users									
b) Convenience to users									
c) Effect on residential communities									
d) Effect on business community									
e) Change in accessibility									
f) Severance effects									
<b>8 Community perceptions</b>									
a) Nearby (social impact spectrum)									
b) Community wide (SIS)									
c) Regional community (SIS)									
<b>9 Development and redevelopment</b>									
a) Supports existing development									
b) Encourages development changes									
c) Supports new development									

## 1.6 Institutional integration and leadership

Selecting the future location and form of a major transportation corridor capable of accommodating the foreseeable long-term needs of our major urban areas requires a 'quantum leap' forward from our past tendency of single purpose and incremental planning practices. Obviously there are several approved agencies involved and the NZTA is frequently going to be the initiator of a particular project. It is not possible, however, for a single purpose agency to undertake this exercise on their own. Only with full collaboration is it possible for society to be drawn to agree on a vision for a sustainable land transport system embracing a strategy of major corridors for that region.

The lead agency responsible for seeing the full planning potential for these major corridors is achieved should be the regional council, which should be actively involved in regional strategic planning and regional transportation planning programmes. Only at this regional level is it possible to have a clearer and comprehensive overview of all the relevant planning issues. This should be undertaken in the context of both the regional policy statement (under the RMA) and a regional council's responsibilities as lead agency in the preparation of the regional land transport strategy (RLTS) (under the LTMA 2003), and as the senior planning authority in the region. The comprehensive approach expected when preparing the RLTS is set out in the Land Transport Act, section 175, and its amendments and these are included here as appendix A.

In keeping with the 'effective', 'responsive', 'integrated' and 'sustainable' purposes of the LTMA 2003 it is necessary to achieve an integrated understanding of cause and effects of transportation corridors on the fabric of the community. The patterns of future land use and the effects of alternative long-term strategic transportation and land-use planning options must be addressed and modelled. These longer-term strategic issues relate to urban form and describing urban structures, (such as concentrated or poly-centred urban and commercial development patterns), that are best suited to modern city development. These issues are regional and district council responsibilities, which fall under the legislative umbrellas of the Local Government Act 2002 (LGA) and the RMA.

Such planning processes involve integrating a wide range of professional and institutional energies. This integration is complementary but also additional to the current practices such as the 'assessment of environmental effects', 'requirements', 'designations', 'plan changes', 'economic cost benefit' which are already expected to be undertaken as part of environmental assessments under the RMA. However integrated corridor planning should enter the work schedule well before those individual assessments and administrative processes are undertaken. This is a conceptual and strategic aspect of planning, requiring inter-professional cooperation and understanding that should precede selecting specific proposals, their adoption and approval.

The planning principles related to the space needs for quality corridor environmental outcomes, have been well understood following work undertaken in the USA (Tunnard and Pushkarev 1963) and the UK (McLoughlin 1969) in the 1960s. Yet they are still largely ignored. The question is 'Are compromises being made that result in narrow corridors, lower standards of environmental protection and conflicts in adjacent land-use management because of administrative, technical, economic or political decisions?' These issues need to be addressed and the answer may well be it is a combination of all these factors.

In New Zealand the task of integration has, on occasion, been successfully addressed at a regional level through establishing a cooperative widely representative technical group. Such a focused planning study group should desirably be facilitated by the regional council. It is likely to comprise a joint group of planning, economic and transport experts led by an acceptable and experienced director. However, responsibility for ongoing leadership and follow through will ultimately rest with the regional planning

agency. This is also the conclusion of the researchers who produced *NZTA research report 379* (Dunbar et al 2009), which is a robust analysis of organising integrated urban development projects.

In this research, the two forecasting periods of 1 to 20 and 20 to 50 years are chosen to separate the longer-term strategic thinking from the shorter 10- and 20-year asset management investment horizon. Second, it is considered that while in 50 years time there may be some additional modes of travel in use (even to the extent of some air/personal jet flights within urban areas) the vast majority of travel demand will still be land based and continue the mix of modes of travel with which we are presently familiar. There are a variety of innovations, such as electronic headway management, travel demand management, intelligence systems and other devices to assist in safer and higher density use of major transport corridors. There is also a range of new energy sources such as hydrogen cells, bio fuels and electric motors with hybrid power plants which will reduce dependence on fossil fuels. With these imminent technical advances it is inevitable that there will be increased trip making and higher levels of travel demand in the future. Even if there were a major shift to public passenger transport, travel demand by private car and goods vehicles will continue to increase. Certainly the need for well aligned and effective transport corridors will still exist in 2060 in our increasing urban conurbations suited to increasing person trip making. In any case the need for a firm definition of long-term major corridors will still be relevant, and a 'cautionary planning' approach to securing them for the future must be applied now and every opportunity taken to implement them.

## 2 Literature review

### 2.1 General bibliography

Section 10.1 lists the general and historic references which have informed this research. There has been much written on this topic. The 1960s and 1970s references listed in section 10.1 cover a range of matters from the English experience in *Landscape of roads* (Crowe 1960) and *Traffic in towns* (Buchanan 1963) and then from the US *Man made America* (Tunnard and Pushkarev 1963) and *The city as environment* (Lynch 1965). *Urban and regional planning – a systems approach* (McLoughlin 1969) provides useful and clear reference introducing concepts of ‘activities’, ‘space’, ‘communications’ and ‘channels’. We are concerned here with the type of channel, the ‘location’, the ‘connections’ and the ‘sensory qualities’.

Good Australian references include *Cities for tomorrow, integrating land use, transport and the environment* (Westerman 1998), *Growth corridors – key to metropolitan expansion* (Morrison 1970), *The relationship between urban form and travel behaviour* (Brunton and Brindle 1999) and *Long term planning for Canberra* (Harrison and Stephenson 1973).

The New Zealand Ministry for the Environment has shown interest in the concept and has researched economic, environmental and transportation aspects. Some relate to urban form while others are concerned with the economic significance of urban corridor development. Some of these are included in the general references.

It will be appreciated that there are a very wide range of issues relating to the dynamics and economics of urban corridors in terms of extended directions for guiding urban growth so as to accommodate suburbs and employment for greatly enlarged metropolitan areas. These broader planning concepts, which are supported by a library of international literature, are widely recognised in support of alternative strategies for regional urban development. However the scheme planning for transportation corridors considered in this present research is confined to planning, design, land-use management and implementation which are a ‘subset’ of these wider geographic/economic considerations. However, once a new corridor is adopted there are many positive effects down-stream which emerge as a consequence of the decision being made. Not the least is a widened support for a coherent model and plan for regional growth which can be the focus for everybody involved.

### 2.2 Australian practice

It is appropriate here to refer briefly to the Australian experience. Some research has been undertaken in Australia on the economic and development benefits derived from the development of major transport corridors in metropolitan Sydney and elsewhere. Examples from Canberra and Campbelltown and the 2000 Olympic Village at Homebush by Black (2003) demonstrate the value of corridors in stimulating development and leading to urban strategy initiatives.

Corridor planning is accepted as being relevant at two levels: the regional and the local. The former affects urban form and the transport and open-space characteristics of the whole metropolis. The latter relates to local cross sections and consideration of the transportation footprint as it affects urban design and local habitation.

If integrated urban and transportation corridor planning is ‘good public policy’ then it is necessary to have an evaluation framework. In terms of objectives of sustainability, international literature refers to six major areas of input and assessment including:



- economic efficiency (regional and local)
- contribution to economic growth (regional and local)
- protection of the environment (visual, landscape and pollution)
- equity and social inclusion (regional and local access to jobs and services)
- safety and security (including both district and local perceptions)
- liveable streets and neighbourhoods (place with active modes and pedestrians).

There is some evidence that well conceived and integrated corridors will assist all six objectives.

Whatever the outcome it will be the consequence of a multi-disciplinary team's efforts and cannot rely solely on good engineering of the transport facility alone. This also requires stronger cross community leadership at all levels.

Australian states and regions also order their affairs through stronger state government transport departments. Such departments include the main roads and regional state planning authorities, eg the Queensland Minister of Transport approves and publishes land transport strategies, eg *Connecting SEQ 2031: an integrated regional transport plan for south east Queensland* (2010). The Queensland Department of Transport and Main Roads serves a population about the same as New Zealand's and has a public expenditure on all modes of transport about twice that of New Zealand's national total.

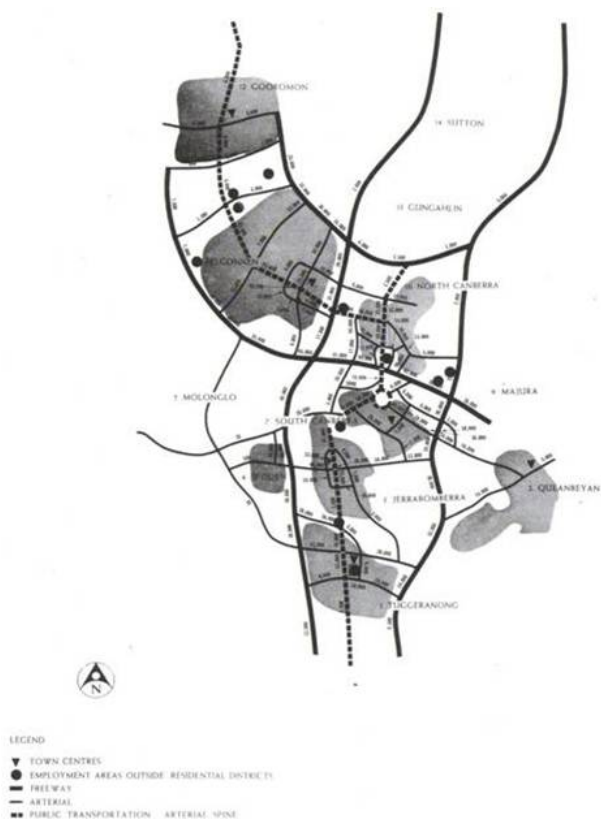
These published policies and programmes have the effect of regional plans and give the agencies affected and the public the opportunity for information and comment. The public consultation phases have frequently been linked with the broader issues of developing a regional framework for growth management.

The Australian state and regional studies and reports have been concerned to address land use, urban growth change options, transport corridor planning, environmental issues, reduced vehicle emissions, reduced reliance on the car and integrated public land transport solutions. Public transport, walking, cycling, travel demand management, social justice, safety and environmental impacts have all been considered in a relatively comprehensive and integrated manner for some years. The Australian investment in new roads and public transport is both buoyant and widely supported in the community with a higher level of expenditure per head of population compared with New Zealand.

Corridor planning in Canberra as the national capital has been developed to a most sophisticated level. Such corridors are seen as key urban development tools matching, and in Canberra's case, preceding transportation demand as illustrated in figure 2.1. These regional plans rely heavily on traffic modelling and projection and extensive consultation on objectives, project packages and above all a government commitment to the process including the outcome of developing some very effective multi-modal corridors. They are well reported by the National Capital Development Commission and by other commentators (Morrison 2000).

The environmental standards used as a basis for monitoring and performance indicators are also more explicit and apparently widely supported within and outside government. Although (judging by the special purpose noise mitigation noise walls alongside railways and the newly built freeways south of Brisbane) Queensland also has its problems with reverse sensitivity and meeting traffic noise, environmental standards and sustainability.

Figure 2.1 Canberra planning structure map 1969



Source: National Capital Development Commission 1968

## 2.3 Recent NZTA research reports

It is appropriate to acknowledge a series of research reports prepared for and published by the NZTA (and the former Land Transport NZ) in the past six years which are relevant to or impinge on this project. The following summary is a brief comment on the findings of nine of those research reports.

Most of these reports emphasise the concepts of integration in its many institutional, administrative and technical dimensions. Some are concerned with the risks of implementation and the need for stronger regional strategies. Others relate to provisions in regional and district plans and integrated transport assessments.

The government group of transportation and environmental agencies together produced a valuable position paper *Integration of land use and transport* (Allan 2007). This phase one report summarises the emerging themes under legislation, policy, institutional frameworks, funding, planning and capability. This work concludes that under these headings there are no barriers to delivering an integrated approach, but there is a need for more clarity in policy development and good practice. However the extent and effect of funding is critical and then RLTSs should identify the need and quality control of outcomes more effectively. The group recognised that the capability can be strengthened through best practice guidance and up-skilling of professional resources and decision makers. The up-skilling of the joint professional capability in planning and developing quality transportation corridors is a practical example falling within those IAP recommendations.

*Land Transport NZ research report 311* (Dantas et al 2006) 'Energy risk to activity systems as a function of urban form' contemplates the nature of urban form in terms of transport energy use and develops a model (RECATS) for assessing the risk of the number of trips lost in an oil shortage. Taking greater Christchurch as

an example the concentrated urban area has the least 'loss of trips' and the urban sprawl model has an increase of about 20% more trips. The effects of reduced congestion, perhaps through the completion of motorway networks and the increase in the resulting trip making, should also be considered and modelled.

*Land Transport NZ research report 320* (James and Date 2007) 'Impact of urban form and other characteristics on the implementation of urban road pricing' compares New Zealand cities and how they might be adapted to road pricing by considering them alongside overseas best practice established in Stockholm, London, Singapore and Rome. The common issue between all these is a desire to reduce congestion, emissions and trip times without investment in further road space. The restraint of road pricing combined with the encouragement of increased public transport use seems common to all examples. The relevance to this research lies in the proposed future proofing of major corridors and making provision for the development of bus ways or light rail right of way.

*Land Transport NZ research report 333* (Ward et al 2007) 'Integrating land use and transport planning' provides a comprehensive and useful analysis of the key planning instruments and practices related to the RMA, the LTMA 2003 and the LGA. It also reviews some overseas experience to identify factors essential to effective integration to support sustainable transport outcomes. The report stresses the need for greater resources and improved monitoring of transport and land-use planning at the regional level and also the need for government leadership and commitment to sustainable land transport outcomes. In the context of this present research the report is useful as a broadly based overview of the framework within which such planning must be undertaken and the need for clear responsibilities and accountability. It concludes that with consistent professional and administrative effort the present framework need not be an obstacle to good outcomes. If effective, multi-functional corridor practice may stretch the imagination of those involved and represents an example of 'building capacity through professional development programmes that review how different disciplinary cultures operate and promote new ways of working together with the integration of relevant skills'.

*NZ Transport Agency research report 354* (Hunter et al 2008) 'Better integration of land use and transport at regional level: scoping of regional guidelines' recommends a 'tool box' to assist regions in integrating land use and transport by first considering guidelines that would shift the focus from 'business as usual' to a more strategic set of transport policies. Multi-function corridors are an example of the need for 'an integrative imagination' that gives commitment by all agencies involved to think beyond the 'business as usual approach'. Second, because of the cost and the political risks involved with regional transport strategies there is a need to manage that risk. Under the heading of possible tools, the report refers to the value of best practice case studies on the development of policy at a regional, sub-regional and local level to support land-use transport integration and 'a consistent template needs to be developed to capture and communicate best practice'. The adoption of long-term future multi-functional corridors is such a best practice tool.

*NZ Transport Agency research report 362* (Tonkin & Taylor Ltd 2008) 'Incorporating sustainable land transport into district plans: discussion document and best practice guidelines' is a very useful analysis of sustainable land transport and its implications for district plans. The report includes guidelines and suggests best practice and check lists for provisions in district plans. It does not traverse the issues of regional policy statements or regional structures for urban form in the context of urban development strategies; nor does it consider developing major regional long-term transportation corridors. There are also appropriate references in section 7.4.2 'Environmental and amenity values' to reverse sensitivity arising from locating residential activities close to busy transport facilities. In table 7.2 there is reference under designations to 'consider future transport corridors with particular focus on future strategic transport links in the district' and also in section 7.4.5.4 to 'provide designations for existing and future transport routes, and for upgrades to the road system, including sufficient area to accommodate setback distances for sensitive land uses'.

*NZ Transport Agency research report 379* (Dunbar et al 2009) 'Organising integrated urban development projects' is an excellent report which strongly recommends enhancing the integration of transport and land-use planning by specifying a governance structure to encourage inter-agency and cross-sector coordination. This entity would be independent of the implementing agency and the political decision makers so it could focus on the specific outcomes and access a range of project planning, project management and the skills required to secure the implementation. The implementation agency could be a council controlled organisation or a public private partnership (PPP). After looking at New Zealand's present planning experience with strategies, plans, packages and activities the researchers consider a smart growth governance structure with an 'implementation management group central to all levels of governance, management and operation'. The report concludes that at the implementation of major urban development projects it is necessary to establish an independent implementation agency to cover both management and operations. Regional level arrangements have the greatest potential to maximise skills and provide the overview to support and span major projects. The regional planning investigations related to identifying and defining the nature and extent of a major transport corridor must be undertaken first and possibly some years before such an implementation entity can be established to bring the concept plan into existence. In other cases the major corridors will be achieved by enhancement of existing partial or substandard corridors.

*NZ Transport Agency research report 422* (Abley et al 2010) 'Integrated transport assessment guidelines' brings together a number of references on the topic and applies the principle of integrated transport assessments (ITAs) in the context of New Zealand planning institutions, policies, statutory processes and transport impacts. Of the four 'scope' definitions for applications for development (simple, moderate, broad and extensive) the matter of the relationship of proposed corridors to the proposed developments might have to be considered in a 'broad' ITA scope and certainly would have to be considered for any 'extensive' ITA scope. The latter involves policy which is 'expected to align with regional and national policies, objectives and visions'. In these circumstances the strategy for future transport corridors warrants a longer time frame for forecasting the effects in the 'extensive' ITA assessment.

*NZ Transport research report 444* (Donovan et al 2011) 'Integrated transport and land use: Sylvia Park as a case study'. The recent opening of the Sylvia Park shopping centre provides a valued opportunity for survey and analysis. This is an example of before and after studies related to a multi-modal destination at a critical shopping node close to major arterial and motorways and well serviced by bus and rail facilities. The travel demand mode split emerges as 65% drivers, 27% passengers, 3.5% rail and 1.3% bus. The site is adjacent to both the southern motorway and fronts the Mt Wellington Highway. It appears to be located deliberately close to the major corridors in the south east of Auckland. While having the confidence of proximity to the transport corridors the application's ITA demonstrated that, from both a regional transport corridor and urban form view, the location was judged in planning terms to be well located.

## 2.4 Project scheme reports

Section 10.2 of chapter 10 lists the project or scheme reports for the 24 projects which were the subject of this investigation. These projects are further described in appendix F.

The bibliography in chapter 10 includes references to relevant Canterbury Regional Planning Authority reports the authors were involved in during the 1960 to 1980 period when the councils in metropolitan Christchurch supported the development of three major transport corridors to the north, the west and to Lyttelton in the east. This support evaporated in the 1990s when the St Alban's motorway was abandoned by Transit NZ (largely for political reasons). The city council then withdrew its support for corridor planning and declined to take responsibility for the continuation of the construction of the Northern motorway. Another opportunity lost after 30 years of commitment.

## 3 Existing institutional framework and strategies

### 3.1 NZ Transport Strategy and Connecting New Zealand

The NZ Transport Strategy (NZTS) (MoT 2008) was a non-statutory document released by the previous government and has been largely superseded by subsequent policy decisions. So while the government supports the overall intent of the NZTS it is now less relevant as a practical guide to the issues facing New Zealand and the transport sector in the immediate term. The government believes that stakeholders should refer to *Connecting New Zealand* (MoT 2011) as a more current summary of the government's transport policy and intentions: 'The purpose of *Connecting New Zealand* is to summarise for stakeholders the government's broad policy direction for the transport sector over the next decade. It will assist stakeholders to better understand how the government sees the transport system developing over that period' (MoT 2011).

From a corridor perspective, key aspects of *Connecting New Zealand* are the roads of national significance (RoNS) programme, regional roading projects, public transport services and a recognised focus on Auckland, Wellington and Christchurch.

### 3.2 Land Transport Management Act 2003

The LTMA 2003 includes some specific land transport policies and provides, among other things, for a more flexible funding framework for land transport so that the needs of all modes and users are taken into account. The purpose of the LTMA 2003 is to: 'contribute to the aim of achieving an integrated, safe, responsive and sustainable land transport system'.

Section 19B of the Act requires that:

*The Agency must, in preparing a national land transport programme,—*

*(a) ensure that the national land transport programme—*

- (i) contributes to the aim of achieving an affordable, integrated, safe, responsive, and sustainable land transport system; and*
- (ii) contributes to each of the following:*
  - (A) assisting economic development:*
  - (B) assisting safety and personal security:*
  - (C) improving access and mobility:*
  - (D) protecting and promoting public health:*
  - (E) ensuring environmental sustainability*

Future RLTSs must therefore embody these national objectives, in some form, although they may also include additional objectives appropriate to a particular region. A key element in meeting the intentions of the LTMA 2003 will be that the RLTSs identify selected lengths of multi-modal and single mode transportation corridors and networks.

In 2007 the transportation planning review period was increased to from three to 10 years which is a more realistic horizon for strategic transportation planning purposes. Experience of those involved confirms that strategic transportation studies, including major transportation corridor planning, requires that the high-level strategies should be a 30 to 50-year time frame for agreed urban development information and as a long-term framework enabling the selection, planning, programming and implementation of such major transport corridor strategic facilities.

All of these institutional and strategic policy changes lead to the conclusion that long-term transportation corridors provide many of the answers on both regional strategy and transportation sustainability grounds and should be planned and implemented at least in our six or seven major cities.

### 3.3 Role of the NZ Transport Agency

The NZTA was established in 2008 when it inherited the role of both Transit NZ and Land Transport NZ and took responsibility for transport planning and programming under the LTMA 2003, as amended by the Land Transport Management Amendment Act 2008, including management of the state highways. It is the Crown entity that promotes and allocates funding for safe and sustainable transport for all modes of land transport (excluding Kiwi Rail). It is responsible for the allocation of all government-sourced public land transport funds (amounting to about \$1.8 billion in 2006). The balance of the funding comes mostly from local government including rates (about \$0.7 billion 2006). Land transport subsidies to local government are subject to programmes that must meet the criteria and policies of the NZTA.

The legislative basis for RLTSs is set out in section 175(2) of the LTMA 1989 and is included in appendix A of this report. The NZTA seeks to integrate the efforts of all transport and planning authorities at national, regional and local levels.

The majority of the major transportation corridors are the most significant parts of the state highway system administered by the NZTA's Highway Network Operations (HNO) unit. State highways warranting special attention lie within the major urban centres and their immediate environs. In this context there is a range of planning, community and environmental factors which all impinge on the nature and scale of the corridor and the willingness of the NZTA to fund more comprehensive and integrated corridors. These corridors should reinforce the urban form and community structures of our future poly-centred metropolitan areas and regional urban centres.

The government in 2009 adopted a Government Policy Statement on Land Transport Funding 2009/10 – 2018/19 (GPS) and this has become the main document for influencing land transport planning and funding. As previously mentioned, the GPS gives priority to the implementation of the RoNS programme. In June 2011 the NZTA published a state highway classification system based on the function of state highways. This will enable the development and implementation of levels of service appropriate for the function of each state highway, and support better planning, management, maintenance and improvement of state highways.

The NZTA's planning and investment framework emphasises an integrated approach to transport planning for New Zealand's complex, multi-faceted and changing transport environment. It reflects the roles that land use and transport planning should play together. It sets out how national and regional priorities are reflected in investment strategies and how RLTSs are used to guide and compile transport programmes which will deliver on the priorities for investment given in the GPS and in the NZTA's Investment and Revenue Strategy.

In the context of this present research it appears that the current GPS and the NZTA planning and investment framework are a relevant 'modus operandi' for the short- and medium-term programmes

within planning horizons of up to 20 years. There are also longer term, ie 30 to 50-year, strategic planning horizons to be considered. These longer-term strategies for transportation, land use and environment include the selection of future major multi-purpose corridors and their integration with the strategic land use planning and urban development strategies for each region.

Obviously the NZTA should be a participating partner in such long-term studies and the resulting integrated planning. Such regional planning must be initiated by local and regional government in order to develop and adopt relevant metropolitan and regional growth strategies. The regional plan would then be a 'corner stone' input into the future RLTS.

### 3.4 Commentary on regional land transport strategies

The LTMA 2003 repeated the 1998 statutory requirement for regional councils to prepare a RLTS, which must not be inconsistent with any regional policy statement (under the RMA). It also stipulated the preparation of annual monitoring reports. From a government perspective the RLTSs are required to reflect the purposes and objectives of the LTMA 2003.

From a state highway strategic viewpoint the NZTA/HNO is a major player in the development of the RLTSs and in addition about half the investment made in roading is on state highways in every region.

RLTSs have been prepared under the requirements of the Land Transport Act 1998 by all regional councils and unitary authorities. Some regions have consistently prepared careful RLTSs which are robust and supported by the councils as RCAs. These are of great assistance to the councils and the NZTA. However, the performance varies depending on the issues, the resources and transport planning undertaken by the participating councils in each region. The basis and purpose of the RLTSs, as originally established by the Land Transport Act 1998 (sec 175(2)) are set out in appendix A.

Few of the RLTSs, however, take advantage of well established transportation assessments or modelling techniques. The Auckland, Wellington and Canterbury Regional Councils have in the past had the technical capacity to do this work. However with the decline in regional planning and regional transportation planning since 1991 their technical and political capability to lead the public debate in the transportation field has reduced significantly. The regions have tended to opt out and leave this essential task to councils and the NZTA. The RLTSs in the smaller regions rely on a less technical and more subjective regional consensus as their basis of establishing visions, setting objectives, making assessments, prioritising and identifying programmes of improvement. Outside the half dozen major metropolitan areas this may be quite adequate.

The previous generation of RLTSs was assessed in an independent thesis (McDavitt 2002). This found 'there was a failure to monitor implementation paths, a failure to identify performance measures or indicators, and where indicators are identified they are often not measurable and not surveyed or reported. The treatment of land use and regional development issues varies considerably from being ignored through to being overstated in justification of specific proposals'. The same paper concludes that 'for New Zealand RLTSs to be more effective policy instruments, implementation and monitoring performance needs to be improved'.

Because the RLTSs are generated in the regions and reflect the spatial needs of their geography and economy, they can be a source of valuable transportation objectives, information, network definition, in addition to the prioritising of projects and budgets for all modes.

The regional land transport committees (RLTCs) have tried to fulfil their responsibilities in a thorough manner. Generally, in preparing the RLTS many regions meet the mandate to ensure stakeholder and

public consultation is effective and the immediate needs of the regions have been identified correctly. These needs are generally more ambitious and involve budget increases which are more than the National Land Transport Programme can afford. In addition they are sometimes more politically rather than technically supported (eg Christchurch light rail). However, while the regions have the opportunity to undertake serious urban development strategic studies and match them to the transportation facilities, few are considering these growth preferences seriously for input into their RLTSs.

The process of selecting relevant policies, testing alternative options for urban development and transport is a complex exercise. This involves a mix of political, community, corporate, technical transportation and planning assessments. There is also a need to have an ongoing independent, well qualified and competent professional technical advisory committee to assist the regional council in its development of the RLTS and assessment of strategic options.

As set out in the review of RLTSs and land transport programmes (LTPs) undertaken in 2004 by Transfund (2004), deficiencies in current RLTSs include:

- a lack of clear national objectives (the LTMA 2003 plus GPS policies fill this vacuum)
- a lack of rigorous land-use modelling and testing of land use/transport alternatives
- a lack of transport trade-offs between objectives in a multiple objective environment
- a lack of clear strategic direction and emphasis in transportation improvement
- the lack of a definition of network systems and road classification
- a lack of reconciliation of financial programming and implementation
- the absence of reporting the measurement of change and effective monitoring programmes
- the absence of a regional view on corridor planning and multi-modal corridor planning
- the absence of a longer-term regional transportation corridor location and standard
- the absence of recognition as to how the arterial road network contributes to the urban form.

These deficiencies have resulted in some regions and some programmes not having an integrated or adequate technical basis. This has, in turn, eroded the commitment of the participating agencies (eg the NZTA, other government bodies and councils) to the RLTSs and LTPs.

Key conclusions of the Transfund (2004) report were:

- 1 RLTSs are needed to provide a focus and tool that reconcile the national, regional and local strategies covering social, economic, environmental and physical planning objectives for sustainable land transport.
- 2 Regional councils should review their RLTSs to match the principles of sustainability, to provide rational support to relevant land transport strategies, and the selection of packages that meet the region's environmental, social and growth needs.
- 3 Transfund can assist the regions by providing guidance in the content of RLTSs so as to match the LTMA and its allocation process.
- 4 Assistance may be required to increase technical resources for improved transport.

In the context of this research most regions will treat the management and protection of their existing road networks over the next 20 years as their first priority. However in the six major urban regions, based on Auckland, Hamilton, Tauranga, Wellington, Christchurch and Dunedin, the prospect of changing



economic, social, land-use circumstances and the accommodation of increasing traffic flows in a sustainable manner, dictates that a system of corridor planning should be established and corridor protection should be included in RLTSs now to anticipate the needs of the future.

### 3.5 Regional collaboration

Regional collaborative arrangements, both informal and legislated, of the type suited to transportation research and regional planning have worked well in New Zealand and overseas in the past. They enable a 'whole catchment' view of all travel modes related to all land-use activities in the region. A regional framework for transportation planning and multi-modal corridor planning, in particular, is essential to secure quality in resource management, environmental protection, urban development, sustainable development, adequate testing and monitoring and the coordination of all the agencies involved with long-term strategic transportation options.

At the regional level, integration of transport planning is readily understood and the work of all transportation agencies can be coordinated across all modes and integrated within a single regional strategy. The strategy and funding programme can be tested and proven to conform to the overall strategic policies for that region. It is only through a higher level of regional planning, regional agreements, coordination, funding and commitment by all, that successful and coherent programmes and transportation corridors will ever emerge.

It seems the regional forum type agreement, such as that which emerged in Auckland prior to the formation of the 'Super City', could ensure the necessary agreements, commit the necessary resources to identify the location and the form of the major future single mode and multi-mode transportation corridors. The LGA certainly envisages joint agreements between councils and between regions and city/districts, the NZTA/HNO and other transport agencies.

In respect of RLTSs it is concluded that:

- 1 RLTSs can provide a realistic focus and a useful tool that reconciles the relationships between the region's transportation strategies and social, environmental and economic horizons within each region. RLTSs provide the framework for the assessment of alternative strategic regional options.
- 2 Regional councils will need to continue the reviews of their RLTSs in the light of the widened strategies embodied in the LTMA to match the principles of sustainability and to provide a consistent and effective assessment of the components contributing to comprehensive land transport strategies.
- 3 The NZTA already provides guidance in the content of RLTSs to meet its transport allocation process requirements as a pre-requisite to local LTPs and the NLTP. The NZTA might also press for a higher technical transportation planning input into RLTSs alongside its NLTP activities and its desire for consensus programmes.
- 4 The LTMA acknowledges there is a need for a renaissance and increase in the resources applied to transportation planning including the reviewing and preparation of the next generation of RLTSs. This includes a longer time frame of 30 to 50 years plus. This is in addition to the 20 years required by previous legislation and asset management. This is essential for sustainable transportation and development of corridors suited to the mobility and development of our future communities.
- 5 The RLTS is a key integrating three-dimensional platform. First, it provides a meeting point within the regional group of road authorities including councils, the NZTA and other transportation agencies. Second, it is the only instrument where long-term planning for urban development strategies and transportation strategies, including modal options such as rail in all its forms, public transport, active

modes and car and goods vehicles can be brought together, balanced and formally reconciled. Third, it is a unique instrument of contact, agreement and budgeting between central and local government which involves significant national and local funding and is subject to continuing and annual review.

- 6 For effective 'transportation corridors' and 'community structures' to be put in place on the ground it is essential there is a continuity of programmes and ongoing progress at the planning, operational and network management levels. The corridor programme will only be included in the RLTS with strong professional support from transportation planning and regional/urban planning teams working effectively in an integrated manner at government, regional and district levels. To do this, three or four of the larger regions must become the leading institutions of excellence in this field of transportation planning and corridor planning in particular and will need to be resourced accordingly.

This research acknowledges there has been a migration of these skills, from local and regional government employment, to New Zealand consultancies and overseas in the past 20 years. This leaves many councils, including most of the regional councils, in the position where they may not currently have the professional resources or experience to supervise and manage detailed planning investigations associated with the development of robust regional plans for urban development and future major transportation corridors.

### 3.6 City and district plans

A primary strategic responsibility of city and district councils is to identify urban developments and future urban form options. This in turn can be integrated into the regional strategy and give confidence in the projections of future transportation demand and the resulting transport corridor planning.

The RLTS together with the regional passenger transport plan (RPTP) sets, by general agreement among all agencies, the over-arching regional targets and objectives. The detailed programmes are incorporated in the NLTP. However, it is the road authorities, ie NZTA/HNO and city/district councils, who actually implement them with construction and networks on the ground.

There may also be sub-regional transport strategies and studies at the central business district (CBD), a suburb or a district level. Such local or city strategies form important sub-regional studies and strategies that need to be agreed between the RLTC and the local authorities and undertaken within the context of the region's RLTS.

The cities/districts must include policies and rules in their district plans to determine the nature of any future development. This includes defining their road hierarchy and the administrative provisions of their district plans to control land uses abutting the major transport networks.

This research has demonstrated the need for a new style of zone in district and city plans. The 'corridor protection zone' would generally precede, by many years, the need for notices of requirement and a designation (refer to appendix D).

Obviously in the case of transportation corridors for the future these will have to be included in the district plan following integrated planning, transportation, environmental studies and urban form considerations. Sometimes, especially where the proposal is 20+ years in the future they could be as corridor protection zones initiated by the council, and at other locations a designation might be included by the road controlling authority for more immediate action within say a 5- or 10-year planning horizon.

## 3.7 Public involvement

Another major change over the past 40 years has been the increased extent of public consultation, public meetings and substantial Environment Court references and hearings. We now live in an era of endless public relations, 'consultocracy', litigation and Environment Court process. Some of this is, of course, generated by vexatious or selfish interests surrounding property rights and compensation.

While people should be encouraged to exercise their right to have and express their concerns, because the sources of funds for litigation tend to be related to those with special financial interests the process has become bogged down. The designation process itself does little to encourage multi-modal or multi-agency joint schemes. Quite the reverse, an agency has enough trouble keeping its own house in order so as to meet deadlines for its own designations. It does not wish to complicate matters by getting into 'bed' and negotiation with other agencies on a joint requirement and split opinion on a designation process.

In addition at the decision-making table, especially where proposals are being traversed and evidence given of a highly technical nature, it is desirable that the commissioners and the Environment Court or Environmental Protection Authority have knowledgeable designers with appropriate experience available to assist in sifting the evidence and reaching a technically sound and confident decision.

What is certain is that there is now more public consultation, more submission processing, more public relations and 'spin doctoring' associated with public authority planning and infrastructure programmes than ever before. This emphasises the need for an early start on planning transportation corridors so the principle objectives and locations are established through rigorous technical analysis and public hearings many years prior to commencement of the budgeted project. It also leads to the usefulness of having a council-initiated corridor protection zone as one of the tools needed to protect an ample area for the major long-term future corridors.

## 3.8 Role of the Environment Court

The Environment Court's role in exploring the issues related particularly to regional policy statements, regional plans and district plans in terms of the RMA, is essential and generally respected. There are, of course, as many detailed issues relating to effects on the environment and development as occur with road designations and other applications for consent. A vast amount of knowledge on transportation, landscape, the environment and the community has been presented by professional witnesses under the even-handed guidance of the judges and to the advantage of all present.

In the past the designations and transport corridors have generally been proposals from single purpose agencies, or network operators, eg Transit NZ (NZTA) or district councils in their role as a road controlling authority. Any appeals have normally been between the road authority and the adjacent owners. Sometimes it is a three-cornered debate with the council and the region or the NZTA having an independent planning view on the merits of the proposal. The quality of evidence before the Environment Court has been high and the Environment Court process has given protection and encouragement to many planning, engineering, environmental and landscape experts in their evidence and presentations.

However, the planning for major transportation corridors has a focus well beyond individual sites and includes the effects from a footprint much wider than the minimum right of way or motorway/road reserve. In urban areas this widened scale of consideration has been debated in only a few cases where alternative regional and city-wide urban forms have been considered, eg St Albans motorway appeal (1987), Transmission Gully, Porirua (1998).

This higher level of debate includes issues such as achieving superior urban form and broader urban development strategies, future modal split and environmental objectives. As higher quality corridor plans and urban development strategies emerge, by their nature they will have to be integrated schemes advocated as a combined proposal on behalf of several agencies. It takes the debate into the need for changes to the regional plan or the district/city plan and well beyond the scope of a RMA Notice of Requirement. It would seem that major corridors would enter the Environment Court arena as part of a regional policy statement or district plan review or change, and possibly, as suggested in this research, as a new corridor protection zone.

For these reasons in the future it will be essential that such multi-purpose and comprehensive transportation corridor proposals come with all agencies agreed to an integrated and comprehensive proposal. This will need to be promoted through specific plans in the RLTS and the NZTA policy framework, before it is included as a designation or a specific zone change to the district plan. The designation process for a long-term future transportation corridor proposal is not an appropriate forum for these high-level debates. They come too late in the process and are too restricted in their scope. A 'zoning type' technique (corridor protection zone) would seem necessary for protecting a future long-term (30 to 50 year) major transportation corridor proposal as envisaged in this research.

### 3.9 Benefit cost and strategic priorities

Since the mid-1970s, a shortage of funds, reflecting a hostile political attitude to increased transportation investment (especially corridor planning for the future) has caused the planning and supply of new facilities to slow down. For reasons of expediency and diplomacy, improvements have been confined mostly to isolated safety and congestion relief measures in the existing road network. Few of the really significant and major new strategic road improvements, which would change and significantly add to the regional transport corridor networks, can ever reach a benefit-cost (B/C) ratio of 2 let alone a B/C of 4 which was required in the 1990s before a project would enter the next five-year programme.

The B/C has been seriously challenged as the dominant technique of controlling investment in an under-funded transport system. A series of papers including David Watson's (1994) *To B/C or not B/C* and others by Susan Harris (1994) and Michelle Clare (1994) have contemplated the intangibles and stress issues surrounding property purchases. In 2000 the Wellington Regional Council published *The wishbone study* (Hastie 2000) which further explored the limitations of B/C ratios as a basis for strategic and structural additions to the networks. Since 2009 some additional funds have been made available and the roads of national significance (RoNS) programme has removed the blind and complete adherence to B/C alone when considering the government's selected list of key corridors now under construction.

Put simply, we are here considering transportation planning and property purchase issues on a 30 to 50-year discount base, while road paving and operational aspects are assessed on a 5 to 10-year basis. This difference in timeframe makes the purchase of property for future corridors a strategic issue of land resumption for public ownership. It falls outside the time frame of B/Cs designed to compare investments in operational transport and network improvements. The issues surrounding early purchase of transportation corridors are similar to the re-possession of land for the Department of Conservation's Crown national parks estate or for a council's purchase of a major recreation reserve. In the recent past there has been something dramatically wrong when projects have been dropped from the NLTP because the budgeted property purchase costs of the strategic transport corridors were prevented from entering the programme queue. There has also been little research on the opportunities and economic benefits for earlier purchase of the land for longer-term multi-modal road, rail, corridors and integrated proposals.

The resumption of land for future long-term key transport corridors, the subject of this research, needs to be lifted out of the general funding basket and given a policy share of national and regional funding to enable their progress. Perhaps this land should not be a charge on transportation budgets and should be paid from local government's regional planning property purchase funds.

### 3.10 Summary on strategies and processes

The provisions of the LTMA and the GPS with RoNS 2009 has provided a direction and a commitment by central government to develop integrated and sustainable transportation networks. In the major metropolitan areas this should be informed by robust and comprehensive (30 to 50 year) future projections of regional land use and transportation studies. This will include identifying and confirming the location and scale of major future transportation corridors.

The RLTS process has shown the benefits of securing wider understanding and collaborative support for LTPs on a regional basis. The regional councils have produced RLTSs of varying quality and effect (Douglass and Wigmore 2004). However they are not all supported by technical resources, research and planning forecasts resulting from urban growth and regional development strategies. The technical capability of the regional transportation team and their consultants needs to be lifted so as to manage these transportation studies and report them, independently, to the council and the public. Such studies have recently been undertaken in Wellington, Auckland, Christchurch, Bay of Plenty, Waikato and Hawke's Bay regions and the cross linking between transportation corridors and future urban form is recognised. However, the transportation corridors have not, in our opinion, received the attention and status they deserve.

What of the use of traffic demand management and motorway tolling? TDM, especially at ramp metering on entry locations to the major corridors being discussed here, is of course an effective management tool and can be assisted through space and design in the development of these future corridors.

What about toll roads and developing major transportation corridors which are planned to facilitate toll roads? Such toll roads should be established and encouraged in the medium as well as the long term. Tolls on future major transport corridors in the suburbs could provide the funding to enable the roads to be built earlier. In addition, tolls provide a practical management tool that would provide an economic restraint on trip making. The major motorway corridors discussed in this research would all be candidates to be part of a toll network and have differential road pricing in the future.

Regarding the NLTP, it may be appropriate to introduce two levels of RLTS planning: level one being immediate planning (1 to 10 years) prepared for budget management purposes under the present regimes and level two long-term planning (30 to 50 years) prepared on a joint partnership basis using consultants from a range of disciplines, ie economic, regional planning, transportation and urban form planning skills. This would enable the RLTS to reflect these longer-term future needs and be an integrated regional agreement between local agencies and the NZTA on behalf of central government.

## 4 Arterial roads and access control

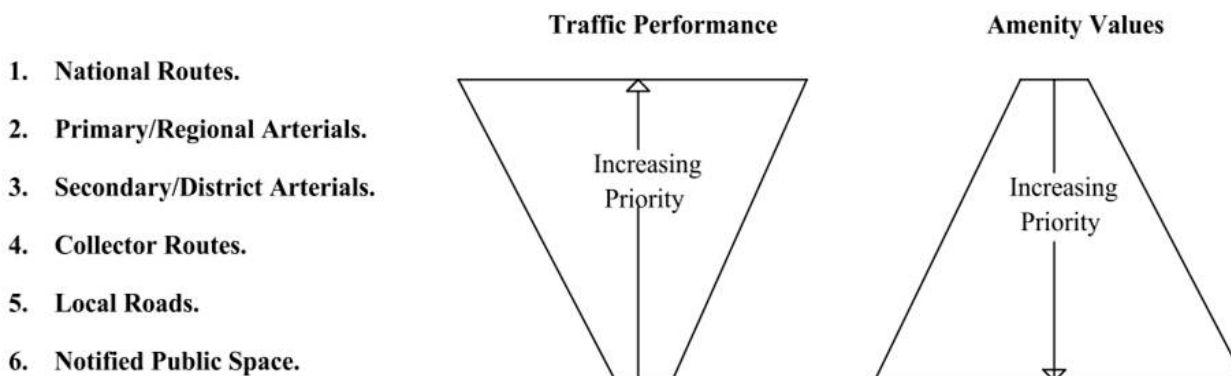
### 4.1 Road hierarchy classification and access

This chapter considers arterial roads and the majority of these are existing NZTA/HNO or council roads. Arterials make a major contribution to the road network both as progression and as collector distributor routes. They are the ‘work horses’ carrying a major share of traffic movements for both long and short trips on the regional road networks. They are, however, the lower level of corridor considered in this research.

The importance of managing property access, developing access management structure plans (AMSPs), widening arterials to become expressways with the associated designation for immediate needs, and creating corridor protection zones for longer-term provisions is emphasised in this research.

The balance between safety, efficiency, land-use and community activities to achieve a sustainable network is the responsibility of the NZTA and every local council. The link between operational traffic performance, amenity/local needs and access safeguards must be assessed for each road type in the hierarchy and is outlined in principle in figure 4.1.

Figure 4.1 Road hierarchy traffic and amenity balance



This simple diagram illustrates the principle that for higher order roads in the traffic hierarchy operational performance is given dominance. For lower order roads where frontage, access and ‘place’ factors are more important, then pedestrian amenity, community and local accessibility values are given greater policy and design dominance. Ideally the corridor development, the property access management and the environmental standards/amenity outcomes are prescribed in the district plan and are related to the operational performance of each road’s place in the hierarchy of the network. This was well established in the 1960s and 1970s; however, with successive district plan reviews under the RMA, the application of these principles of road type and access management have, in some cities and districts, been neglected or compromised.

Access management is one of the most useful tools in road management enabling protection of traffic and community standards for safety and the environment. The concepts are simple but to be effective they require comprehensive and systematic network studies, planning, funding and consistent implementation of clear policies to be successful. The road controlling authority (be it the NZTA or councils/arterial roads) may have a comprehensive planning policy manual that embraces the standards and rules relating to access on major urban arterials, as illustrated in figure 4.2, and also rural arterial highways. Not all arterial roads would be treated the same and obviously stricter control would be placed on a road acting as a by-

pass to a town or an arterial which is a corridor passing between suburbs, in contrast to a central spine road within a suburb or passing through a town shopping centre.

Westerman (2003), the Australian transportation and urban planning consultant, stated:

*When extended this (arterial corridor) planning approach combines known practical strategies into one new single management strategy. The framework of these interlocking strategies is:*

- *reducing the traffic pressure on and within the sub-region under consideration*
- *managing transport routes and their associated land-use environments*
- *preserving and enhancing the concept of a “city of villages”*
- *preserving and enhancing the quality of the local environment*
- *improving local accessibility, safety and convenience, and increased choice in transport mode.*

The management of the road network in this structured manner is steadily gaining support. However there are many substandard examples where existing roads, especially under the pressure of peri-urban rural subdivision, lose their benign rural land uses and are intensively subdivided or used for urban and commercial types of development. Clear policies relating to the road hierarchy, which are agreed nationally and applied widely, are needed for safety, convenience, environment, and urban and suburban form. The issue is primarily a matter of commitment by councils to agree on a hierarchy, preferably on a national basis, and then implement the hierarchy through their district plans in a sensible manner. This is understood and generally envisaged by both the pioneering and present generation of road designers, urban designers, landscape designers and surveyors. It is not difficult and adoption of a widely used code of practice, such as the subdivision road standards NZ 4404, and the National Road Classification System currently being developed by the NZTA, with its associated network operating framework, are supported by this research.

**Figure 4.2** Typical major urban arterial, Lincoln Road, Christchurch



## 4.2 The challenge of access management

From some preliminary assessments of changing land use and traffic patterns it is apparent that in the past 20 years there has been a significant proliferation of accesses, sales activities and commercial ribbon development along the two-lane rural and urban arterial road network. In some situations this has reduced the safe capacity and lowered the levels of traffic service on key road lengths. This can represent a significant loss of transportation efficiency and capacity (up to 25%) and once that loss in level of service has occurred, experience shows it may be difficult to recover it later.

How should the land uses be managed along these critical lengths of state highway and council arterial roads (the length of road considered here may represent only 10% of the roads in the whole network). There are three areas of concern for the country's existing arterial road network. These are:

- road corridor planning
- access control
- land-use traffic management.

These three areas require an ongoing policy framework. All three areas should be identified and monitored as part of the RLTS and district plan review and policy formulation. The corridors can be identified, along with other designations, in the district plan. Management can include land-use controls achieved through the zone locations and conditions included as provisions of the district plan and also design and layout requirements for individual sites.

On arterial roads access control may involve providing alternative access through AMSPs, construction of separate frontage roads, provision of medians, prohibition of turning movements, licensing and strict control of crossing and access points. The overall purpose is to retain the levels of traffic service of what are multi-modal arterial road networks so as to provide safe and convenient future travel on these sections of the road network.

Where changes to land-use and access provisions are proposed they must meet appropriate standards and may be subject to an integrated transport assessment process, as recently defined in *NZTA research report 422* 'Integrated transport assessments' (Abley et al 2010).

## 4.3 Evolution of state highway limited access roads

It has been appreciated since the 1950s that control of access and in particular restraint on intense traffic generating land uses, advertising and commercial activities alongside state highways and rural arterial roads, are significant factors affecting levels of traffic service, safety and the long-term effectiveness of state highways and councils' major arterial roads.

The Transit New Zealand Act 1989 continued provisions for identification of existing access points and proposed access points and also the imposition of conditions and possible withdrawal of such crossing points. There are also other conditions that might be used, eg related to the frequency or intensity of traffic using the entry crossing, and review or approval periods. These sorts of management conditions were introduced in the 1970s in some parts of the country but have not been pursued consistently.

Transit NZ set out to make greater use of limited access roads (LAR) and about 40% of the 11,000km state highway network has been declared LAR. In particular this applies on the approaches and near to urban areas which are suffering overload, loss of traffic service and conflict from frontage activity. However these lengths are the very ones where land-use management, the removal of crossing point accesses and



the prohibition of abutting a subdivision will need to be corrected through the process of preparing AMSPs for inclusion in district plans.

An access management classification system can define when, where and how access can be provided between abutting land and the highway network. Table 4.1 was prepared as a draft for Transit NZ (Douglass 2004) and it sets out an access management schedule illustrating the practical implications of developing such access management policies for each class of major arterial. The classification can also identify the interaction between the classified transport routes, the adjoining land use and provide for AMSPs.

As suggested by Austroads (1998), integrated highway planning involves a range of access management tools including:

- Austroads (1998) *Principles for strategic planning*. Sydney: Austroads.
- Austroads and Transit NZ (2007) *Planning policy manual for integrated road transport planning*.
- corridor management plans: high-end segregation and complete access control
- AMSPs: access control supported by district plans
- LARs: specific access management to individual property
- access rules: district plan and road authority policies for normal situations.

Within this framework, there are corresponding practice manuals, statutory access management mechanisms, preferred abutting land uses, zoning policies and district plan consent processes.

**Table 4.1 Access management classification management system for arterial roads**

(Road function, characteristics, land use, planning and access spacings)

Description (code)	Motorways (M)	Expressways (E)	Rural A (RA)	Rural B (RB)	Urban A (UA)	Urban B (UB)
a Service function and access	<ul style="list-style-type: none"> <li>Priority on traffic movement – access only at interchanges</li> </ul>	<ul style="list-style-type: none"> <li>Emphasis on traffic movement</li> <li>Minimum access</li> </ul>	<ul style="list-style-type: none"> <li>National rural arterials</li> <li>Emphasis on traffic movement</li> <li>Access restricted and managed</li> </ul>	<ul style="list-style-type: none"> <li>Regional rural arterials</li> <li>Emphasis on traffic movement</li> <li>Access restricted</li> </ul>	<ul style="list-style-type: none"> <li>Major urban arterials</li> <li>Emphasis on traffic movement</li> <li>Access managed to high stds</li> </ul>	<ul style="list-style-type: none"> <li>Secondary urban arterials</li> <li>Access to urban activities subject to standard rules</li> </ul>
b Desired management outcomes	<ul style="list-style-type: none"> <li>Free-flowing traffic</li> <li>No turns/crossing</li> <li>No peds/cyclists</li> <li>No property access</li> </ul>	<ul style="list-style-type: none"> <li>Free flowing traffic</li> <li>Min. turns/crossing</li> <li>Ped/cycle selected segregated</li> <li>Little direct access</li> <li>AMSPs</li> </ul>	<ul style="list-style-type: none"> <li>Free flowing traffic</li> <li>Min. turns/crossing</li> <li>Ped/cycle managed – access at widely spaced intervals.</li> <li>AMSPs</li> </ul>	<ul style="list-style-type: none"> <li>Relatively free flowing traffic</li> <li>Turns/crossing managed for safety</li> <li>Ped/cycle accepted</li> <li>Well spaced access.</li> </ul>	<ul style="list-style-type: none"> <li>Uninterrupted traffic</li> <li>Turns/crossing designed</li> <li>Specific ped/cycle facilities</li> <li>Parking restricted</li> <li>Strict access rules</li> <li>AMSPs</li> </ul>	<ul style="list-style-type: none"> <li>Some traffic interruption</li> <li>Turns/crossing permitted</li> <li>Kerb parking with controls</li> <li>Graded access rules</li> <li>Ped/cycle lane.</li> </ul>
c Typical travelling environment	<ul style="list-style-type: none"> <li>Urban and rural de-restricted speeds</li> <li>Generally multi-laned with optimum lane balance</li> </ul>	<ul style="list-style-type: none"> <li>Urban and rural dense traffic flows</li> <li>Approaches to urban centres</li> <li>Multi four- and two-lanes.</li> </ul>	<ul style="list-style-type: none"> <li>Major heavy traffic</li> <li>Rural and also approaches to urban areas</li> <li>Multi four and two lanes + passing lanes</li> </ul>	<ul style="list-style-type: none"> <li>Regional routes</li> <li>Significant traffic between towns</li> <li>Two-lane rural roads with passing lanes</li> </ul>	<ul style="list-style-type: none"> <li>National routes through large cities and towns.</li> <li>Four-lane divided</li> <li>One way pairs</li> </ul>	<ul style="list-style-type: none"> <li>Urban routes through small cities towns and urban fringes</li> <li>Two-lane mid block multi-lane intstctns</li> </ul>
d Community frontage activity and amenity	<ul style="list-style-type: none"> <li>Nil</li> <li>Motorway amenity landscaping</li> </ul>	<ul style="list-style-type: none"> <li>Min community activity</li> <li>Ped/cycle segregated</li> <li>Roadside amenity and landscaping</li> </ul>	<ul style="list-style-type: none"> <li>Limited activity</li> <li>Ped/cycle paths</li> <li>Amenity landscaping</li> </ul>	<ul style="list-style-type: none"> <li>Moderate activity</li> <li>Pedestrians, cycles in small settlements</li> <li>Amenity landscaping</li> </ul>	<ul style="list-style-type: none"> <li>Substantial urban activities</li> <li>Some ped/cycles</li> <li>Some amenity planting</li> </ul>	<ul style="list-style-type: none"> <li>District urban activities</li> <li>Many peds/cycles</li> <li>Moderate amenity planting</li> </ul>
e Indicative design speed (km/h and speed limits)	<ul style="list-style-type: none"> <li>110 to 120</li> <li>100km/h speed limit normal</li> </ul>	<ul style="list-style-type: none"> <li>100 to 110</li> <li>100km/h speed limit normal</li> </ul>	<ul style="list-style-type: none"> <li>80 to 100</li> <li>100km/h speed limit normal</li> </ul>	<ul style="list-style-type: none"> <li>80 to 100</li> <li>70–80km/h speed limits in urban sections</li> </ul>	<ul style="list-style-type: none"> <li>60 to 80</li> <li>50–60km/h speed limits</li> </ul>	<ul style="list-style-type: none"> <li>50 to 80</li> <li>50km/h speed limits</li> </ul>
f Indicative future AADT (vpd)	<ul style="list-style-type: none"> <li>&gt;20,000</li> </ul>	<ul style="list-style-type: none"> <li>10,000 to 30,000 plus</li> </ul>	<ul style="list-style-type: none"> <li>10,000 to 20,000</li> </ul>	<ul style="list-style-type: none"> <li>4000 to 10,000 (also seasonal holiday traffic)</li> </ul>	<ul style="list-style-type: none"> <li>10,000 to 25,000</li> </ul>	<ul style="list-style-type: none"> <li>800 to 12,000 (also seasonal holiday traffic)</li> </ul>
g Available traffic engineering design techniques	<ul style="list-style-type: none"> <li>Motorway efficient for vehicular use and design with grade separated interchanges</li> </ul>	<ul style="list-style-type: none"> <li>High level design</li> <li>Left in/left out</li> <li>Median divide.</li> <li>Some overpasses</li> <li>Parallel service road</li> </ul>	<ul style="list-style-type: none"> <li>Four lane and median</li> <li>Overtaking lanes</li> <li>High standard at-grade intersections</li> <li>Median divided</li> <li>Widely spaced intersections</li> <li>Some service roads</li> </ul>	<ul style="list-style-type: none"> <li>Quality traffic highway design</li> <li>Overtaking lanes</li> <li>High levels of traffic management</li> <li>Intersection islands</li> </ul>	<ul style="list-style-type: none"> <li>High standard at-grade – multi-lane – medians</li> <li>One-way systems</li> <li>Signal roundabouts</li> <li>Service roads</li> </ul>	<ul style="list-style-type: none"> <li>Flush medians</li> <li>Traffic signals</li> <li>Priority controls</li> <li>Good access design standards</li> </ul>

## 4.4 City and district vehicle access management

The Local Government Act 2002 includes provisions for limited access on council roads equivalent to those in the Transit New Zealand Act 1989. This also requires that LARs are identified in each council's district plan. Some councils included limited access road proposals in the first generation of district plans under the RMA, eg Christchurch City Council with 33 identified roads (see City Plan vol 3, part 8, append 5) amounting to about 40km of such LAR arterials.

There is a general view, held by those involved in applying the legislation, that the process, including placing a memorandum on all land titles affected, is too cumbersome. It has been suggested the same could be achieved by policies and rules prepared on a national basis and included as a roading 'rule' in the individual district plan.

Some councils as road controlling and planning authorities have developed AMSPs. These 'shadow plans' provide an opportunity for the road authority to negotiate with landowner-subdivider-developers to plan a long-term controlled access frontage arrangement. These AMSPs can then have the agreed future road patterns for alternative access included in the council's district plan. For existing major arterials, especially in the 'peri-urban' areas, this process should enable sustainable solutions to be found which would reduce the need to build additional urban and local bypasses over these critical peri-urban lengths of the network. Sometimes urban arterial road frontages are also provided with property segregation strips and at a few locations frontage or 'slip service roads' have also been constructed.

Some city and district council plans, since the late 1990s, have complemented LARs and AMSPs by including graduated rules and restricted discretionary uses to control access and implementing rules for the form and location of accesses on major arterial roads for intense commercial traffic generators. These apply particularly to accesses that are adjacent to important intersections. *NZ Transport Agency research report 422* (Abley et al 2010) 'Integrated transport assessment guidelines' provides a framework for considering such matters. Such management does not, of course, strike at the root cause of managing the adjacent land uses, these being district plan zoning policy and development matters.

## 4.5 Collaborative national, regional, city and district network policies

The underlying issue is that not all roads or transport corridors are equal; some are spine roads through towns and servicing town centre and suburban centres, while others pass between or around areas of intense activity. For example in Christchurch from the land-use and network analysis in the 1960s and a consideration of the future metropolitan urban form, a pattern of suburban localities and industrial locations was identified in 1972 to reflect the pattern of 'rooms and corridors' espoused by Buchanan (1963), as the basis for future district planning (see figure 4.3).

The intention was to have a network of major roads where some of the major urban and rural arterial routes would be protected as 'between' or 'bypass' routes in the Christchurch Regional Transport Plan (1971) and Christchurch District Plan (1974) and the standards of design and landscaping would be planned accordingly over time. Thus the planning policy relating to the major arterial roads between suburbs was to be designed to reflect their function as 'corridors' between 'rooms'. In some cases these major arterial roads received designations for widening to provide an adequate right of way and medians to secure their role as roads lying between suburbs free from further intense commercial ribbon and retail development. However this was not always possible and some arterial roads were transferred to a lesser primary status to recognise their 'local' and 'place' functions and reduce their through traffic functions.

In the urban arterial situation, with the increase in ribbon retail and sales development (evident since 1991, especially where the visitor attracting sales activities were replacing low trip-generating industrial uses), many lengths of important city and suburban arterial streets have suffered a loss of some of their through traffic capacity. This is caused by locally generated traffic associated with the explosion of visitor-attracting land uses now fronting such arterial roads. This additional traffic then takes up its share of the available capacity and causes increased conflict in the traffic stream.

**Figure 4.3 Existing network adapted to reflect corridors and rooms**



While mixed sales activity may be appropriate on a central city or suburban shopping spine road (eg Riccarton Road or Colombo St) it is undesirable on between or through arterial roads (eg on Christchurch's Russley Road or Blenheim Road, or Manukau's Te Irirangi Rd) which are intended to provide progression arterial and high levels of traffic service for urban traffic making longer inter-suburban trips.

A joint and signed off regional agreement is an important assurance of a single integrated plan that includes the protection of the major arterial roads. In the absence of a regional plan under the RMA, such an agreement would be an important element in the preparation, reviews and adoption of the RLTS. This is already one of the mechanisms, together with the policies in the council's district plan. This type of agreement, together with the consultation and consensus achieved during the preparation of the transportation policies and provisions in the council's district plan, provides a useful basis for closer cooperation. For the existing road and street networks this provides an adequate opportunity for collaboration and agreement. In each region it is necessary to establish standards, a uniform application of access rules and also a commitment of resources to arterial road network enhancements to enable such policies to be successful.

## 5 Major transport corridor planning

### 5.1 General situation

There is no other physical element, or use of land within our communities, that affects the environment in our metropolitan urban areas as significantly as the existing roads and motorways and the development of major future transport corridors. Successful planning of land transport corridors and their design to meet both transportation needs and all of the landscape, amenity and community planning issues is a pre-requisite to achieving sustainable transport outcomes, enabling stable community structures and providing an attractive environment. These attributes should be inherent in land transport public investment programmes. An appropriately designed and well constructed corridor will gather up all the individual environmental mal-effects and mitigate them in an integrated manner. The nature of the corridors varies from major motorway to arterial roads and includes multi-modal transportation facilities such as that along the Wellington waterfront (see figure 5.1).

The non-traffic aspects of a transport corridor such as landscape design, adjacent civic urban/design, environment, suburban and metropolitan form are significant and complex. Together they are just as significant as the planning, design and immediate engineering required for corridor traffic and transport functions. These corridors for all modes (including roads for vehicles, HOV lanes, bus ways, heavy and light rail, cycleways, trails and pathways on abutting land ) stretching out ahead of demand enable a long-term (say 30 or more years) reason for the early identification of such corridors. Early identification of this framework also enables confident, sustainable, stable and quality planning for the adjacent community structure and urban form.

These regional planning and urban form issues, have tended to be overlooked or taken for granted by the road or rail authorities as single purpose agencies. It is disappointing that the broader planning and environmental objectives of good corridor planning have not yet been captured in the RLTS schedules. They are acknowledged in principle but not explicitly provided for.

The NZTS was concerned with high-level strategic policies and mitigating effects. While the NZTS set a framework, it did not provide the tools for the spatial and design interpretation. Fundamentally the NZTS had to be underpinned by well conceived regional strategies established through sound regional policy statements, RLTSs and district plan policies and provisions. The planning of transportation corridors is an essential regional strategic issue as the corridors affect metropolitan urban form, the regional environment and the confidence for private and public development investment.

Outside Auckland and Wellington, it appears that few regional councils at present have the technical capability, or the political will, to provide the necessary leadership in this field of corridor planning. The NZTA's HNO unit (previously Transit NZ) has, of necessity, always had an interest in planning for transportation corridors to meet both its immediate and future national and regional transportation needs.

The 2006 amendment to section 30 of the RMA has, after an absence of 14 years, re-introduced urban growth strategies and regional infrastructure as part of the regional policy planning tool kit. At the regional planning level the broad issues of urban form must be correlated with the network planning and transport corridor planning. These are the responsibility of regional and district councils as planning authorities and will reflect the range of regional policy statements and strategies for clean air, clean water, regional open space, regional landscapes, region-wide transportation and accessibility, and regional environmental issues.

## 5.2 Corridor planning approach

The primary purpose of the RMA set out in section 5 of the Act is 'to promote the sustainable management of natural and physical resources'. Communications and the provision of transport and transport corridors fall within this fundamental purpose. The RMA has a focus on the environmental mal-effects of transport rather than the development of comprehensive and effective outcomes or efficient and acceptable systems of transport. By definition, good corridor planning will minimise the adverse effects on the environment in conformity with RMA purposes. There are of course increasing concerns for the consequent effects of global warming, carbon dioxide, noise, lights and safety. The RMA does not require councils or government to propose better plans for transport systems or more attractive transport corridors. These desirable outcomes arise from councils and the NZTA adopting effective policies pursuant of their purposes under the LGA and the LTMA.

However, the RMA is the legislative basis for assessing environmental effects when proposals are presented for developing future transport corridors. These assessments are made prior to an application under the RMA Notice of Requirement for designation provisions, or an application under the more recent legislation (2010) to the Environmental Protection Agency. However these statutory provisions do not set out the objectives and trade-offs for superior design, efficient transportation, quality planning and environmental enhancement.

Detailed and comprehensive assessment of major road 'corridors', as inferred in figure 1.2, is essential because it:

- recognises that different routes have different relationships with adjoining land
- shifts the focus from transport route design to its relationships with the environment, reverse sensitivity and other trade-offs at early stages of planning
- identifies the different locations and situations requiring different approaches toward integrated planning, management and operations
- provides the basis for developing networks in new areas and can be used to identify problems, local connections, solutions and priorities in established areas
- clarifies the type of corridor to be achieved and the possible changes in future transport function, access issues, subdivision and the character of adjoining development
- provides an opportunity to accommodate other facilities, ie storm water drainage areas, open space margins, urban tree planting, forest areas, cycleways, footpaths and other infrastructure
- can provide logical boundaries between different land-use zones, establish logical boundaries for different suburbs by providing 'corridors between the rooms'.

An early landscape analysis and strategy for the Christchurch topography and landscape prepared for the 'Christchurch Regional Planning Authority *Landscape report on the Christchurch motorways* by Turbott (1968) sets out clearly the advantages of corridor planning and included multiple functions, landscape policies and abutting land-use characteristics. A relevant extract from that report is included here as appendix B.

Implementation of successful multi-functional corridors has proven to be difficult and it requires great determination and very early space allocation. This has this been successfully achieved in only a few cases in New Zealand. The Wellington harbour motorway, as illustrated in figure 5.1, is a truly multi-modal corridor with rail, buses, all types of motor vehicle and a cycle lane alongside much of its length. Because the corridor is located along the foreshore and valleys of the city, there were no other options for the location and the result is one of the most comprehensive multi-modal transportation corridors in the

world. The corridor reinforces the landscape and urban form and incidentally provides a stimulating and fascinating ride for residents and visitors alike entering Wellington alongside the harbour. It largely meets all the objectives of major corridor planning.

There are also some other co-locations of road and rail in Wellington and Auckland with the main north railway placed alongside the SH1 and the SH20 motorways.

**Figure 5.1 Wellington waterfront motorway (looking north)**



### 5.3 Commentary ‘on again off again’

Since the mid-1980s events have shown that politically, as well as in statutory planning and financial terms, it has not been possible to protect or construct the scale or extended style of planned traffic corridors in the clear and firm manner that were earlier envisaged when the first generation master transportation plans and regional and district plans were prepared for Wellington, Auckland and Christchurch in the 1960s and 1970s.

The resulting compromises and reduced corridor widths have severely limited the effectiveness of the plans and in particular greatly reduced the wider metropolitan benefits of transportation corridor planning and the ability to secure a future-proof facility or plan for transportation sustainably.

The historic and premature uplifting of well conceived earlier designations (eg Auckland eastern motorway, Christchurch southern motorway, St Albans motorway, Wellington Transmission Gully) have all been expensive ‘on again off again’ mistakes. These projects represent the worst type of on again off again planning, frequently undertaken because of local pressure or for political reasons. Interestingly on returning to these proposals 40 years later, the new millennium or current 2000 proposals have designation locations which are generally coincident with their predecessors’ line in the 1960s. These earlier lines, eg Christchurch southern motorway, would have been technically quite acceptable and the subsequent amendments after much extra design work have been relatively minor.

In the Auckland, Wellington and Christchurch regions, had the land for the urban major road corridors planned and designated in the 1960s and 70s been purchased/resumed at that time, there is no doubt, that more of the motorway and arterial transport facilities would be in place by now. Furthermore, with better integration and consistent effort by the agencies involved it would have been easier to defend projects before the Environment Court and the facilities would have been implemented to higher space standards. However this was not to be and the transport agencies have been subject to ‘pressure point’

road improvement planning, adherence to cost-benefit programming and expedient (ie short-sighted) decision making with minimum corridor requirements.

The major elements of a road network should not be planned in isolation from the rest of the surrounding area or have to be promoted by a single purpose network agency. Unfortunately railway and highway authorities have different agendas and their construction programmes seldom coincide. However the early allocation of corridor space would assist in this situation and could lead to more shared space in the future. Corridor planning requires a holistic and integrated approach in which all disciplines and all agencies collaborate to take advantage of the changes proposed and create a new and improved environment and superior community structures in the future. The need is to achieve greater environmental benefits, so that they more than offset the disturbance and possible environmental dis-benefits of the projects. To do this, more space must be secured for the corridor and purchased many years before construction.

The purchase of the corridor space should be a prior decision separated from the construction and the latter's budget programme which generally comes many years later.

## 5.4 Corridor locations, urban form and corridor widths

Regional and district planning for urban boundaries, shopping centres, suburban communities and open spaces are all integral to the urban form, and access to and from the major regional road network. Generally the major arterial routes and corridors arising from a RLTS can be expected to pass between the rooms or suburban localities and most frequently will provide readily identified boundaries to communities and major land-use localities.

From an environmental point of view these land-use interfaces abut the edges of the transport corridors. The network shape should reflect regional landscape features and the framework of major open spaces linking throughout the regional urban area. Frequently there is the opportunity to integrate the open space and transport corridors so they provide a wider landscape view and a worthwhile buffer between the transport corridor and the adjacent development. The style of multi-modal combined road, rail, bus and infrastructure corridors, as illustrated in figure 5.2, also have the opportunity to bring within a single widened transportation corridor all future transport effects. In this way they will reduce their incremental impacts on the rest of the urban area.

**Figure 5.2 Perth southern freeway and light rail corridor at Millpoint**





When such corridors are first planned and purchased they should have an ample right of way for medians and side berm areas to both secure their role as adequate facilities when built and also to provide future proofing and the opportunity for additional traffic capacity. On occasion it may be found necessary to initiate a complementary district plan change for relocation, modification or expansion of adjacent urban activities or variation to the boundary of a suburb to take full advantage of the altered circumstances.

There are many excellent examples of sympathetic and good treatment of multi-purpose corridors. The Porirua motorway and rail alignment beside the harbour illustrated in figure 5.3 is a good example of multi-mode corridor planning in one open-space setting.

**Figure 5.3 Wellington SH1 road and rail corridor Porirua Harbour**



The need for multi-lane flexibility is underscored by the future provisions for bus lanes, bus ways and bus station facilities as provided for on the Auckland northern motorway and illustrated in figure 5.4.

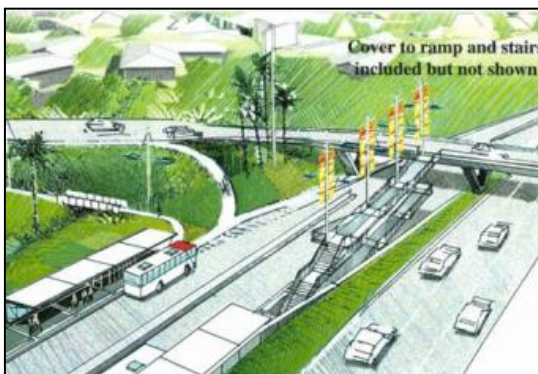
**Figure 5.4a Motorway bus lanes**



**Figure 5.4b Segregated bus ways**



**Figure 5.4c Bus interchange**



A 'strict' adherence to benefit-cost analysis combined with a decline in available funds, have resulted in a decline in motorway transport corridor widths and space standards in the recent past. This leads to a steady erosion in the qualities of the open space and compromises the perceptions of driving in a safe and satisfying environment. This is evident when recent narrower rights of way are compared with the reserve widths of some of the earlier motorways, memorial avenues and boulevards established in the 1960s and 70s. At the same time the 'yard' requirements for siting of abutting houses has sometimes been set in an arbitrary manner with some rear yards being as close as 1.5m to expressway boundaries. The trend to narrower motorway corridors appears to result from 'drawing office' decisions made by engineers and designers in a desire to put forward proposals for the least possible cost and as a way of avoiding the degree of opposition and possible appeals to the Environment Court. The question may well be asked whether such 'design office' consensus, agreed between the road authority and its consultants, in order to secure earlier budget and planning approval is in the best interests of all parties and future generations. It does not serve the interests of future drivers, residents, councils and users if the facility being put forward is under width or has substandard landscaping and buffer planting provisions. These facilities are forever and should be adequate and future proof.

As recently as 2005, the NZTA proposed as little as a 45m state highway width, (ie merely a wide arterial street width) in the case of the Christchurch southern motorway. Such minimum widths will not allow for adequate landscaping or retention ponds and they leave no space for locating special HOV lanes, bus lanes, planted medians, future light rail facilities, margins for bicycle paths, walkways or equestrian trails along the outer berms now or in the future. They also result in new (or existing) residences being located too close to the heavily trafficked carriageways so precluding effective noise attenuation and planting on both sides of the motorway fence.

The present practice of side bunding of say 1.5m height plus a 2m timber paling fence on top is a sad and ugly compromise (or cop out) along the boundaries of several motorways and arterial state highways. These place a substandard motorway layout within an artificial 'confining passage way' forming a cramped environment that will be difficult to maintain. This is illustrated in figure 5.5. Such narrow widths are inadequate and lead to a tight and less attractive cross section on opening day and no flexibility for future expansion (eg from 2x2 lanes to 2x3 lanes or even 2x4 lanes) or later adding bus only lanes, HOV lanes, future rail or as a route for infrastructure location in the years ahead.

Present and future residents must also be protected from the mal-effects of the roads and avoid reverse sensitivity between residents and the traffic. Even with wider corridors a variable and dense planting of the berm areas may be necessary at particular locations to insulate adjacent residences from the distraction and mal-effects of noise, lights and vibration of a major transport facility.

The lack of adequate corridor width plus the absence of an adjacent landscape buffer means, inevitably, that some of the current minimal width facilities are not future proofed to sustainably match future needs of the motorway functions or provide suitable environmental qualities for adjacent land uses within the motorway footprint.

Based on American studies and confirmed in New Zealand reports of the 1960s and 1970s it was established that on flat land, and in order to provide space for future proofing and avoid some of the reverse sensitivity effects, the basic corridors should be 100m wide and houses should generally be placed at least 40m from the shoulder of any future motorway carriageway. Because of cost-saving motives and short-sighted planning these standards have been repeatedly compromised.

Figure 5.5a Christchurch southern motorway contained by bunds and walls



Figure 5.5b Christchurch southern motorway noise contours with bunding and walls

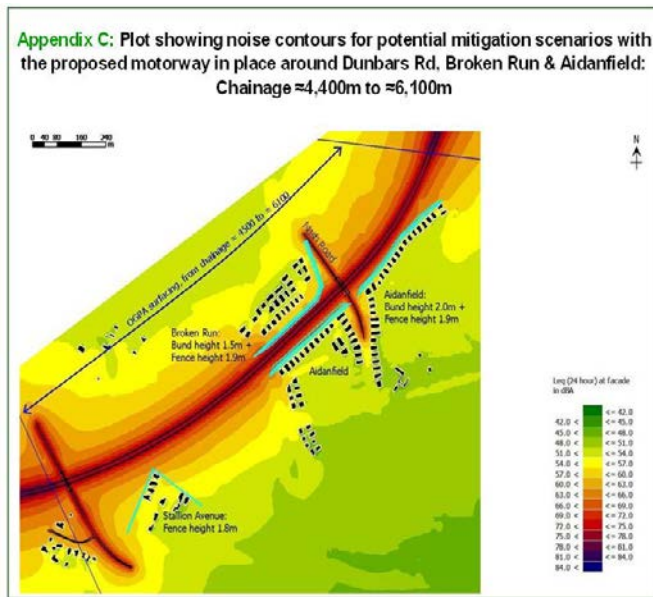


Figure 5.5c Christchurch southern motorway housing behind walls before motorway constructed



## 5.5 Conclusions and standards

This research concludes that:

- 1 'Major transport corridors must be adequate and well planned, they are 'now and forever' and should be designed to add quality landscapes to the metropolitan scene'.
- 2 While vehicle technology, propulsion and design and the form of the road or travelled way may alter over time, the need for ample space to be protected for present and future transportation will persist.
- 3 Adequate open space for flexible future transportation corridors is fundamental. At the same time these provide a stable public open space framework for community structures, thereby providing an enhanced urban environment as well as meeting alternative future transportation needs.
- 4 There should be a national standard or statutory minimum on the width of major transportation corridors complemented by space requirements and agreed mitigation strategies to ensure sustainable planning for future corridors.
- 5 The principle of securing sufficient space well before the time the facility is likely to be developed should be inherent in major corridor planning. This then enables transportation facilities to be developed in a timely manner within adequate corridor boundaries and to provide for future proofing in an economic, effective and attractive manner.
- 6 Well planned multi-purpose transport and open-space corridors enable other transport modes for rail, road vehicles, other travel activities, infrastructure and amenity areas to be integrated and share these corridor spaces into the future.
- 7 These corridor areas are 'very public' open spaces which will be used and viewed intensively by the majority of the population in the future. In rural and suburban areas they may be green open-space corridors. In their inner sections and at interchange locations they should be of sufficient width to enable quality design and include sympathetic quality traffic architecture.
- 8 Transport corridors are permanent and dynamic features of urban form to be used, observed and admired by the population at large and their design should add to the public image of a city's 'map of interest and delight'.

These conclusions point to the need for higher space standards. This is a major factor in securing sustainable solutions for the future and avoiding the lost opportunities that have occurred in the past.

## 6 Regions and roads of national significance

### 6.1 Integrated corridor planning

This chapter gives some examples of the strategic matters of concern to this research purpose and provides a background to the selection of 24 corridor projects to inform the assessments of quality corridor planning.

Integration of land-use and transportation planning, for all modes, is a fundamental tenet for successful regional and metropolitan planning and involves the following five relationship levels:

- 1 The relationship between urban form growth strategies and the development of major transportation corridors serving the settlement pattern (strategic regional planning)
- 2 The relationship between transport routes, the adjacent environment, the adjacent development and land uses within the corridor footprint (strategic district planning)
- 3 The relationship between transportation functions within the corridor and the spaces provided for vehicles, public transport, rail, utility services infrastructure, travel by active modes and open space within the landscape design (transportation planning)
- 4 The relationship of space and width in the corridor to meet the need of future proofing bearing in mind the long-term (50-year) probability of traffic growth and/or addition of multi-modal facilities (transportation and highway design)
- 5 The relationship between regional network links, local networks and local accessibility while enabling suburbs to be free from extraneous traffic (district network planning).

This research is particularly concerned with how major transportation corridors are related to urban form, which includes the recognition of identified centres, and of the edges of suburbs and communities. Other recognised boundaries include large open spaces, rivers, transport corridors, railways and major traffic routes where they pass between communities. Identifying future major transportation corridors and stimulating the growth of town/suburban centres are two of the most powerful tools available to planning authorities to secure future urban form and community structures.

It is now 50 years since Buchanan (1968) observed: 'There is a lesson to be learned from the motorway revolt and the no urban motorways lobby... The lesson is simple urban motorways are only acceptable if possibly linked to an environmental betterment on a scale that outweighs the damage done in the insertion of the roads'.

This can be achieved and the principles to be applied are not difficult to see. It lies in the acquisition of an adequate width of land to cover both the construction of the major transportation corridors and also to enable a buffer and encourage sympathetic redevelopment of the land in the footprint alongside. The redevelopment and the re-arrangement of activities alongside is obviously a planning authority responsibility and should be undertaken in parallel with the transport corridor construction. This enables the reconciliation of traffic and environment and redevelopment in a variety of ways and results eventually in the creation of a substantially improved environment.

Integration of land-use and transportation planning, for all modes, is a fundamental tenet for successful regional and metropolitan planning. Only in this way can environmental quality and sustainability be secured. There are still occasions when 'trade-offs' have to be made in the planning process, and on occasion this may lead to compromised solutions. In this area of planning inter-professional cooperation

is essential to achieve integrated solutions. Explicit and open debate on the options available can do much to give professional colleagues and the public greater confidence in the planning outcomes arising from such important projects.

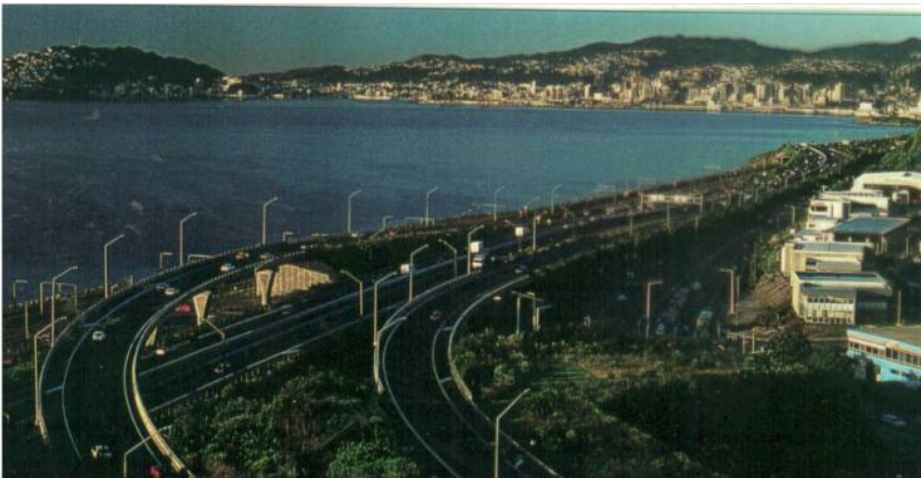
## 6.2 Regional characteristics

While there are broad principles and national policies which effectively shape the solutions to New Zealand's planning and transportation strategies as a whole, the detailed solutions which emerge in each region are different and unique to the circumstances in that region.

The geography and urban forms of the three metropolitan regions are unique and each region requires its own transport corridor solutions. Briefly these three major centres contrast as follows:

**Wellington** is fortunate in having the waterfront motorway and the associated rail, arterial routes and other active modes which have to be located along the waterfront and in the parallel valleys of the Hutt Valley and Porirua. The waterfront corridor with the landward escarpment on the west, creates an intensely trafficked multiple-use corridor. A combination of geography, seismology, transport evolution and human endeavour has resulted in one of the most spectacular landscapes and traffic architected corridors in the country. This is well illustrated in the aerial photo in figure 6.1. Elsewhere the major corridors reflect the Hutt River and Porirua river valleys.

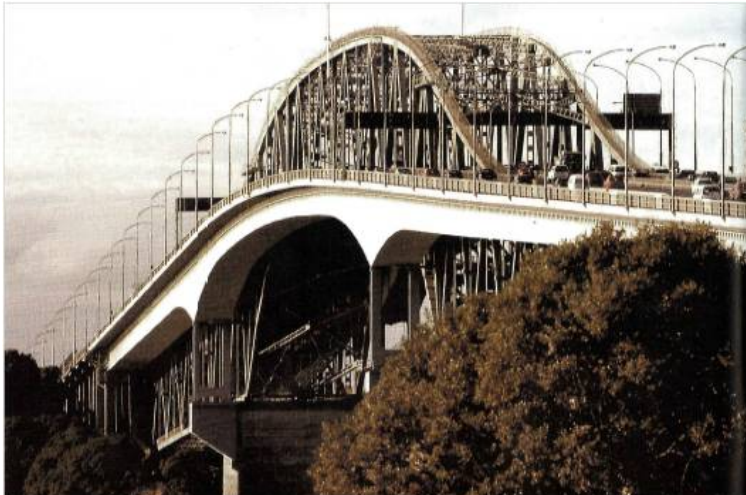
**Figure 6.1** Wellington waterfront motorway (looking south, Ngauranga to city centre)



In **Christchurch** the flat terrain requires different network and landscape solutions. As pointed out by Turbott in his 1968 motorway landscape report to the Christchurch Regional Planning Authority, 'only if extensive open spaces are provided on each side of the motorway' is it possible to really provide interest through near urban and distant mountain views. This means the motorway corridor must be treated as a park-way having view shafts of the flat city, the alps and the back drop of the Port Hills. This open-space pattern enables an acceptable solution to be achieved. The present motorways at Kaiapoi (figure 6.2) and Addington (figure 6.3), both planned in the 1960s, match these sustainability visual criteria very well. However, recent southern motorway scheme planning and corridor definition has not reflected this philosophy so faithfully.

**Figure 6.2** Christchurch northern motorway, Kaiapoi**Figure 6.3** Christchurch southern motorway, Addington

**Auckland** has a great variety of corridors with some spectacular traffic architecture, eg the Newmarket viaduct and in particular the Auckland Harbour Bridge (figure 6.4). Here the environmental interest, at least for passengers not involved in navigating the changing traffic situation, is achieved because of the variety of views and the presence of the beautiful harbour. In other parts of the motorway system the roads traverse the ridges of the easy topographic variations leading to a pleasant relationship between the travellers' route and views of adjacent suburbs and open spaces. There are still many instances, however, of houses being left too close to the motorways or major arterial roads, and buildings located within the corridor footprint making improvements to the existing environment and future enhancement difficult.

**Figure 6.4** Auckland harbour bridge

As a general conclusion, the present design culture is very concerned about the minimum widths from a safety and engineering viewpoint. However, the published environmental assessment or scheme reports seldom describe the variations of the boundary between corridor activities and the adjacent residential open space or other urban activity areas. Regrettably if it is left too tight, which may result in some saving of budget for land purchase, this in the mind of some people, is seen as 'a good thing'.

The author, Douglass, is on record saying:

*As we drive around and see narrowing concrete and wire medians, and then for noise protection only, we see the earth bunds on the road reserve boundary with timber fences two metres high rising above them, I wonder what went wrong and where did we lose the plot?*

*The answer appears to be that the construction of a motorway is a compromise between good design precepts and a drive to get the maximum length built for the budget available. The sad part is that those responsible (politicians, professionals and road builders) all feel 'good' about saving the money on land purchase even if an inferior job is the result. The only effective answer is adequate lateral space for the motorways, be this on the flats of Christchurch, the hills of Wellington, or the suburbs of Auckland. Property purchase is too important a planning issue to be left to operational road authorities alone. Urban open space is too valuable to be spoilt by timber noise walls or hemmed in by artificial stop banks.*

The lesson is clear, in all cases and in every region it requires more space at selected locations outside the initial minimum transport right of way in order to achieve a successful major corridor. This is essential as a means of matching the multi-purpose planning for alternative future transport modes, infrastructure, open space, landscaping, adjacent land uses, views and remote vistas. This way they will better meet the transport requirements of the LTMA with greater flexibility for future proofing. Above all, these corridors should be recognised as enhancing a region's environmental strategies and open-space framework in a sustainable manner.

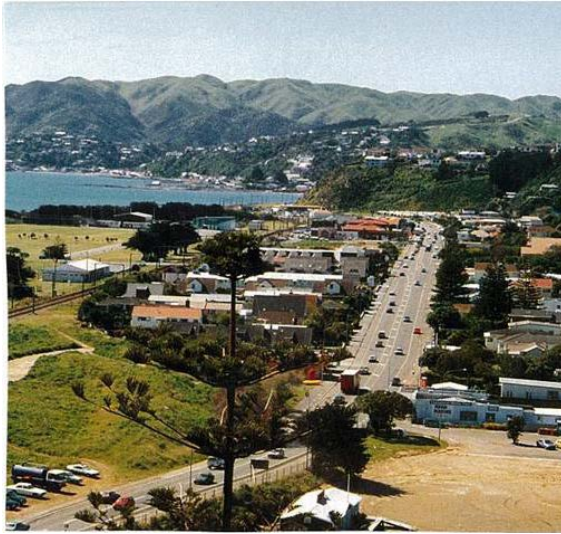
## 6.3 Commitment and four key case studies

Several significant transportation planning determinations in the Wellington region (1998–2005) provide examples which show how the decision-making approval process may result in reversals for political, funding and technical reasons. These major proposals are developed in the context of long-term (30 to 50 year) future strategic planning. They also point to the need for early protection and forward purchase of adequate major corridors. In this way there is more likely to be a commitment from the government, transport agencies and the public, so a consistent policy can be developed that will lead ultimately to an approval with outcomes matching the planning and future proofing required for these major corridors.

- 1 **SH1 Mana Plimmerton.** In 1998 the Wellington Regional Council declined the Transit NZ application for a proposed major upgrade of SH1 on the western corridor at Mana. When this interim proposal was considered alongside the ultimate construction proposed for Transmission Gully (26 June 1998, see appendix C), the council concluded it was best to put up with the present congested SH1 route with only minor improvement in the meantime (figure 6.5) and to remain committed to the larger long-term strategy of earlier construction of the Transmission Gully motorway proposal. Continued support for the latter proposal was considered in the best long-term interest of transport sustainability, the regional environment and the regional urban development strategy. The Mana Esplanade upgrade was therefore declined.



**Figure 6.5 Porirua Mana esplanade**



- 2 **Transmission Gully route.** This route is a bypass in a rural environment where a corridor had been notified for many years and the corridor width could be secured readily to ensure future proofing (figure 6.6).

However, it was not until a national level decision was made within the bigger political picture of the roads of national significance (RoNS) 2010, that adequate funding became available and the Transmission Gully project was commenced in earnest. This was after 20 unproductive years of environmental impact reports, argument, political debate, intense technical reporting and a series of different RMA applications and Environment Court hearings. These debates were generally related to a staged approach with several different interim proposals as RMA Notification of Requirement designation processes. Here again the technical solution and the location of the corridor had been evident for at least 25 years but because of the lack of adequate funding and effective community support little progress had been made and the designation decision-making process had also been left until the route was about to be built.

**Figure 6.6 Wellington Transmission Gully Linden to Paekakariki**



**Wellington Northern Motorway Corridor**

- Porirua, Pukerua, Paekakariki Bypass – 27 kilometres
- View down Horokiwi Valley from Wainui Saddle



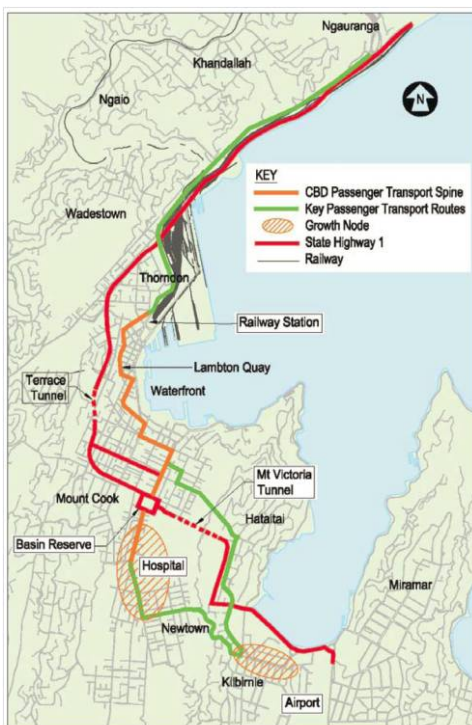
3 **Wellington Basin Reserve area.** With the Wellington urban motorway proposal, the link across Te Aro flat between the two tunnels and around the Basin Reserve has been an ongoing battle. A Transit NZ cut and cover grade separation proposal was abandoned in 2002 and an interim proposal for a one-way street improvement system in the Te Aro flat area was promoted. This was to avoid facing the higher standard and more costly, grade separated Basin Reserve option. This was an expedient compromise decision reflecting an incremental ‘pressure point’ solution which was favoured as a short-term relief.

Figure 6.7 identifies some of the major strategic elements in the Ngauranga to airport strategic study (GW 2007). This is a very comprehensive and integrated approach bringing all modes of travel and the possible redevelopment into the mix and in particular options in the Basin Reserve locality and the sequence of tunnel duplication, in particular the Mt Victoria tunnel. While the interim one-way streets and public transport options have assisted they have been shown, on their own, to be incapable of providing a sustainable long-term future solution. The grade separation is essential and the traffic architecture and urban design for the area is a significant challenge.

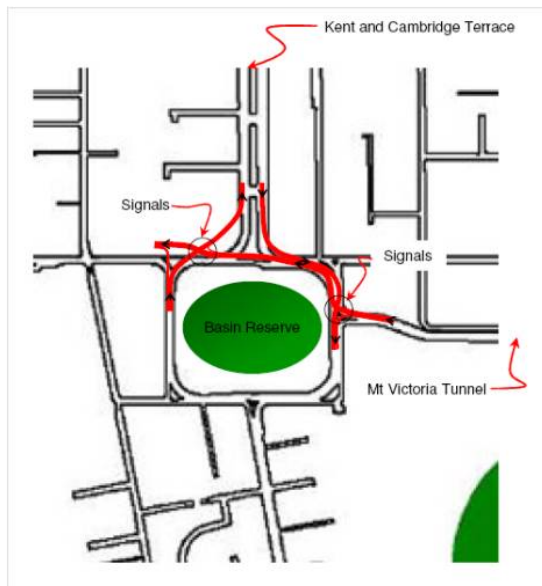
Funding is the biggest issue and it was not until the national level leadership and funding emerged under the 2010 RoNS programme that the essential but more ambitious grade separated corridor plan was agreed. It is only by such a broadly based approach to the Basin Reserve and grade separation relief that a solution is possible. In addition, an urban renewal plan for a modified community structure of the Te Aro locality had to be developed and then the urban motorway absorbed into this as part of planning for the area. The project has been fraught with debate and appeared to be too difficult for both the Wellington City Council and the Wellington Regional Council to resolve as a local government solution. The longer-term structured and comprehensive network solution required an integrated multi-agency traffic and land-use approach well beyond the brief of a road authority acting on its own. It also required a major input of national funds into a RoNS project.

Figure 6.7 Wellington strategic study 2008 – Basin Reserve

a Ngauranga to airport strategic study 2008



b Alignment for at-grade Basin Reserve options



- 4 **The second Auckland harbour crossing.** The future provision of a second harbour crossing is an essential major corridor of a unique variety. As a bridge with approach roads there are many strategic issues common to other major motorway corridors. As a tunnel there are aspects which make its planning simpler but its functions more specialised. It is not clear whether this is part of a solution for the total urban strategy for a poly-centred Auckland region or if it is required by the alternative philosophy of continuing a strategy of increasing the CBD focus and the capacity of the central section of SH1. Alternatively it could be a new rail tunnel link in an endeavour to improve the non-vehicle mode split. The broad options are illustrated in figures 6.8a and 6.8b.

Another partial alternative is to lift the level of TDM and introduce capacity toll pricing and so reduce the demand for the increase in private vehicle harbour crossings. However it is unlikely that suppressing demand would remove the need for the second crossing.

Another broader alternative is a regional planning strategy for more intensive urban development to be established in west Auckland to be served by a higher capacity western corridor as the western 'stave' of the motorway 'ladder'. It would involve widening and extending the western SH20 and north-west corridor to a greater extent than is envisaged at present and would require a larger capacity motorway corridor to run from south to west (ie SH20 route). Such a south-west corridor option might provide a multi-modal opportunity for increased road and rail so as to increase person trip travel along the Wiri to Henderson corridor.

This is further evidence of the need to canvas these options at a higher level of national/regional strategic planning and, as a result, secure solutions with adequate width for future long-term corridors well ahead of construction. Strategic decisions on these issues of policy in the context of the 30 to 50-year future regional planning horizon and major corridor planning are now well overdue.

**Figure 6.8a Second Auckland harbour bridge**



**Figure 6.8b Map of Auckland tunnel and bridge options**



## 6.4 Roads of national significance

Following on from increasing concern, such as that expressed in *The wishbone study* (Hastie 2000), the government has acknowledged the increasing gap between demand and supply for major transportation corridor capacity and has introduced the roads of national significance (RoNS) programme. Only through such a national programme has it been possible to identify the seven key motorway/expressway shortfalls in the major centres and give their status and funding a lift sufficient to move these outstanding but delayed roading proposals into a special NLTP free from the normal LTP limitations. This has lifted several major projects including the Waterview, Transmission Gully and the Christchurch southern motorway, out of their 'forever never-never' situation and ensured these significant major corridors can now proceed and not again be postponed indefinitely.

It appears that the present NLTP programming and financial model is satisfactory for the ranking and development of the NLTP for 90% of ordinary roading expenditure. But the major transportation corridors including those considered in section 6.3 are of a scale warranting different and additional funding in the national interest. However, as with Transmission Gully and also with the Basin Reserve the quality solutions needed to match the transportation, environmental and future proofing requirements of such corridor projects, place them in a higher strategic class of development. These national projects are of a scale that requires 30 to 50 years of protection and commitment as well as a national interest warranting the injection of national funds from a RoNS type programme.

Obviously the three projects referred to in section 6.3 are at the top of the short list of regional transportation corridors of national significance. These three cases are drawn from among a dozen similar major corridor situations considered in this research. They illustrate how the absence of a commitment to earlier strategic planning, the absence of early protection and land purchase of adequate width in these major corridors, together with the limitations on RoNS type funding all lead to uncertainty in the implementation of regional and urban development strategies and the associated major transportation corridors.

The possibility of future combined rail/road corridors has not yet entered the RoNS funding debate, or the present generation of RLTS strategies, and this is to be regretted. In some cases the arguments for a multi-use corridor are overwhelming (eg Auckland Eastern Transportation Corridor).

It is also evident that regional or city councils have successfully taken the initiative with leadership in planning or promoting these major top of the list corridors. This initiative and leadership would normally reside with the government and the NZTA. At present there is also little discussion on regional planning or on urban form in the assessment reports or evidence supporting the 'top of the list' motorway proposals.

It is these larger issues of urban development, environment, modal split, major transportation corridor provision, the quality of the proposed facilities and special RoNS government funding which are the significant dimensions that impinge on this major transportation corridors and community structures research report.

## 7 Assessment of selected projects

### 7.1 Criteria for selection of research case studies

Twenty-four projects were selected for comparison and assessment in this review. Most have been the subject of hard public debate over the years. Where these have now been built and are in operation this has generally been as a result of congestion in that region or locality following development pressures which have forced the need for state highway improvement or duplication. Some of the projects considered have not been built and remain as planning proposals. At least in these cases there is still a chance they can be upgraded, future proofed and made into sustainable facilities assisting the adjacent community structures and environment. However, this is only possible if adequate land purchases have been made and developed with funding on a scale to match the quality designs required for future needs and multi-modal strategies, as advocated in this report.

The following is not a peer review of scheme assessment reports, nor does it consider the details of traffic volumes, engineering solutions, programmes and funding. The purpose of this investigation is at a higher level of strategic planning which considers metropolitan urban form and the contribution of these major transportation corridors in creating improved urban community structures, sustainability and future proofing, from an environmental as well as transportation viewpoint. The detail of the proposals varies considerably and what is important here is the broad grouping of the urban situation, the general layout and characteristics of the sample of facilities chosen and, above all, if the corridor or right-of-way width provides adequate space for the facility over a 50-year planning period. We are not concerned about the details of highway and safety design as we assume that if the corridors are wide enough to meet the future proofing and landscaping objectives they will also meet the criteria for efficiency and safety as well as being more attractive in amenity and environmental terms.

In spite of the many excellent consultant design reports, repeated engineering and planning scheme assessments and consent application evidences, it appears that at the higher strategic levels key questions may frequently be overlooked and are not always addressed or explicitly answered. Mostly the proposals are prepared in the context of the short and medium term (10 to 20 years) and are deemed necessary by the particular transport authority, rather than having a long-term desirability as part of a broader regional development strategy. As the criteria now required under the LTMA penetrate the professional design ranks, the need to consider community structures and community evolution including long-term development strategies is re-entering the decision-making arena. These broader town planning issues have not, in the recent past, been very well articulated and are seldom traversed. These questions have tended to be dismissed early on in the process, only to re-appear at a later stage by way of supporting evidence or even submissions of opposition in the desperate final phases of the designation processes for approvals before the Environment Court.

Most frequently the driving force in setting the brief for the scheme planning phase is that a proposed route has been selected by the Transit NZ (now NZTA) Board and the technical consultants are requested to produce a least-cost project that meets this selected improvement. It is observed that the early consideration of broader options are put to one side once the preferred project has, from an engineering and environmental point of view, been selected. Then the full focus is on the documentation justifying the building of the facility to the given brief at least cost.

## 7.2 24 corridor projects

The 24 projects selected are described and assessed in more detail in appendix F of the report. All the corridors chosen were originally investigated as part of comprehensive transportation studies undertaken in the 1950s and 1960s. Some have been subject to reversals of political decisions as to timing and others have suffered a significant reduction in standards during the scheme planning stage in order to retain their position in the NLTP. The list of projects follows in table 7.1.

The projects are all routes which can make a significant contribution to meet the needs of sustainable community planning and major transport corridor functions for ever into the future. This assumes, of course, that they receive adequate planning protection, have sufficient right-of-way width, satisfactory zoning and protection of the adjacent urban environment.

**Table 7.1 List of projects assessed in this research**

	Built	Status	Length	Multi-mode
<b>Group I. Motorways urban road and rail</b>				
1. AK northern motorway - Barrys to Constellation	1959-97	SH1	8.0km	Rd+bus
2. AK western motorway	1977-2009	SH20	4.5km	Rd+rail
3. AK southern motorway - Newmarket to Penrose	1953-63	SH1	7.0km	Rd+rail
4. AK eastern motorway - Tamaki Dr to Panmure	Proposed	Reg	8.0km	Rd+rail
5. WN waterfront motorway - Tinakore to Ngauranga	1959-69	SH1	4.0km	Rd+rail
6. WN northern motorway - Ngauranga to Plimmerton	1953-85	SH1	18.0km	Rd+rail
7. WN Western Hutt Rd - Melling to Haywards	1960-90	SH2	12.0km	Rd+rail
<b>Group II. Motorways urban and rural</b>				
8a. CH northern motorway - St Albans to Winters Prop	1967	Nat'l	2.0km	Rd
8b. Winters to Chaney's Prop	1966	Nat'l	8.0km	Rd
9. CH northern motorway - Cranford to Chaney's Prop	2002	Nat'l	8.0km	Rd
10a. CH southern motorway - Addington Urban	1970-77	Nat'l	3.0km	Rd
10b. Papanui Rural Prop	1967	Nat'l	10.0km	Rd
11. CH southern motorway - Curletts to Springs	2009-14	Nat'l	10.0km	Rd
12. CH northern motorway - Chaney's to Pinehaven	1962-67	SH1	12.0km	Rd
<b>Group III. Motorway/expressway rural</b>				
13. TP eastern bypass - Airport to Wairakei	2000-11	Nat'l	17.0km	Rd
14. WN Transmission Gully - Linden to Paekakariki	2010-16	Nat'l	27.0km	Rd
15. WK Hamilton expressway - Ohinewai to Cambridge	2007-17	Nat'l	21.0km	Rd
<b>Group IV. Rural expressways/arterials</b>				
16. WN Haywards Road - Porirua to Hutt Valley	Existing	SH5	8 9.0km	Rd
17. CH Queen Elizabeth Dr - Northcote to Travis	1987-92	SH74	7.0km	Rd
18. CH Russley-Johns - Hornby to Belfast	Existing	SH1	10.0km	Rd
<b>Group V. Major urban arterial (streets)</b>				
19. MK Te Irirangi Dr - Manukau to Botany	1998-2000	Regnl	5.0km	Rd
20. AK East West Art - St Lukes to Greenlane	Existing	Regnl	9.0km	Rd
21. AK Esmonde Road - Motorway to Takapuna	Existing	Regnl	0.8km	Rd
22. CH Opawa expressway - Garlands to Port Hills	1985-2005	SH73	2.0km	Rd
23. CH Blenheim Road - Riccarton to Sockburn	1948 & 98	Regl	5.0km	Rd
24. WN inner city arterial - Te Aro tunnel to tunnel	1979 etc	SH1	1.5km	Rd

All of the routes are in the situation where improving levels of traffic service along their length could be achieved by varying scales of enhancement. If such improvement is possible this would remove the need for other major improvements on parallel network links or the construction of other corridors in the future.

With such a diverse sample of 24 major corridors a wide range of corridor situations have been canvassed. In summary they fall into the following five characteristic groups:

- 1 Motorways urban multi-modal parallel rail and road – seven examples, four from Auckland and three from Wellington.
- 2 Urban motorways (road modes only) – five examples, one from Wellington and four proposed routes in Christchurch.
- 3 Rural motorways – four examples, one each from the Waikato, Taupo, Wellington and Christchurch.
- 4 Major rural expressways – three examples, one from Wellington and two from Christchurch.
- 5 Major urban arterial or expressways – six examples, two from Auckland, one from Manukau, two from Christchurch and one from Wellington.

Incidentally there were many other projects, eg Tauranga, which might have been included but time and space were limited.

## 7.3 Dimensions assessment summary

The assessment process described here is set out in more detail in appendix E. A brief description of each of the 24 projects is set out and illustrated in appendix F. In order to assess the projects' sustainability qualities the first round assessment viewed the proposals under four 'dimensions'. This reflected the inventory of questions asked about each project in the assessment and provided a summary view on the projects' ability to meet the sustainability criteria.

### **Dimension 1. Transportation and future proofing – multi-modal and future flexibility**

- Is there an opportunity for a multi-modal corridor including heavy or light rail and bus ways?
- Is there explicit provision for future separate goods or HOV lanes or a lane from the median?
- Is there space adjacent to the corridor to accommodate minor active modes, cycles and pedestrians?
- Is the space for future proofing extra lanes etc available in particular in the high-cost property areas?
- Is the multi-lane facility flexible and able to be reversed to deal with civil emergencies?

### **Dimension 2. Integration of abutting land use and landscaping**

- What is the distance of residences from the edge of the motorway carriageway?
- What is the proximity of industrial plant, buildings and hoardings conflicting with landscape amenity?
- Will the corridor be landscaped and have grade separation areas – do they add to the environmental amenity?
- What is the need for noise barriers, and light screening warranting screening walls and bunds?

### **Dimension 3. Future regional urban form – promoting planning strategies**

- Are the corridors located to reinforce a regional 'corridor and rooms' concept?
- Are the corridors located around the edges and between identifiable suburbs or communities?

- Are the corridors located to support strategic and long-term future regional patterns of urban growth?
- Are the corridors located as part of the integrated open-space system of the localities and the region?

**Dimension 4. Network management – highway and traffic engineering**

- Are the motorway access points from the arterial and collector roads appropriate?
- Are there suitable local inter-suburban cross links over/under the motorway?
- Are the adjacent suburbs served with good collection distributors?
- Are the adjacent suburbs kept free from needless and extraneous traffic?
- Are the district plan rules adequate to control land use and access on the adjacent arterial road links?

These broad ‘dimensions’ focus attention on the higher-level outcomes which are essential to the overall future planning and transportation success of these major transportation corridors.

The projects were assessed in two steps. The first was to consider each of the above four ‘dimensions’ individually and identify how each project met each dimension in turn on a simple ‘good’, ‘fair’ and ‘poor’ performance. This is set out in table 7.2. The four dimensions reflect the four main professional resources applied to the total input in transportation and corridor planning and relate to quite specific engineering, landscape, planning and traffic engineering considerations. Considering all 24 projects the following results emerged from this first round of analysis:

**Table 7.2 Projects and outcome dimensions**

<b>Outcome dimensions</b>	<b>Good</b>	<b>Fair</b>	<b>Poor</b>
1 Transportation and future proofing – multi-modal and flexibility	9	8	7
2 Abutting land use, landscaping – planning integration	12	5	7
3 Regional urban form – promoting planning strategies	9	7	8
4 Network management – highway and traffic engineering	14	7	3
<b>Average number in group</b>	(11)	(7)	(6)

These outcomes show that about half of the sample scored ‘good’ over all the dimensions. Of the balance a quarter were in the ‘fair’ range and the remaining quarter were ‘poor’.

‘Landscape’ and ‘network management’ were well represented with ‘good’ rankings. The more difficult areas of ‘future proofing’ and ‘regional urban planning’ did not rank so well.

The lowest quarter in all four ‘dimensions’ was arterial urban roads in either a ‘retrofit’ or ‘nothing much can be done’ without major frontage road widening situation. In these cases only long-term district plan road widening requirements, with purchase by the council over many years, provide a possible solution to the problem.

For the major corridors, the more difficult matters of ‘future proofing’ and ‘suburban form’ were placed poorly which is an unsatisfactory outcome reflecting a lack of priority in both transportation planning and regional planning at both the initial brief and also the scheme planning stages. This is probably because when economic and budget issues dominate there is always a shortage of funds so that wider corridors and medians and the diversion of a motorway to go around a suburb inevitably increase costs greatly. If budgets are short, the trade off falls against these longer-term more strategic planning dimensions. However, to our knowledge the benefits of such future proofing policies have never been costed; neither have the benefits been assessed in the past.



## 7.4 Future proof ranking

The researchers then undertook a second round of assessment to see what prospect the 24 projects had, in their view, of meeting sustainability outcomes. Taking each project in turn the researchers then gave a Rank A, B or C to establish their relative performance in terms of the three areas of traffic future proofing, urban planning and environmental qualities. In summary the results were as follows:

**Rank A.** Has potential to meet the outcomes in all three areas.

**Rank B.** Can possibly be expanded to meet these criteria with some refit and expanded landscaping.

**Rank C.** Is well short of being able to meet an acceptable standard. The route may need either relief from another parallel route or a major retrofit exercise involving major widening.

Desirably all projects in all corridor types would be ranked A and none would end up as C. Using these rankings the grouping emerged as shown in table 7.3.

**Table 7.3 Ranking by corridor type**

Corridor type	Types	Rank A	Rank B	Rank C	Total
Major urban motorway	(I and II)	5	5	2	12
Rural expressway motorway	(III and IV)	4	1	1	6
Major urban arterial	(V)	1	2	3	6
Total		10	8	6	24

**Rank A.** In general terms it was assessed that 10 of the 24 projects had been planned to be capable of the future proofing and good practice that met the sustainable transportation, planning and environmental strategies expounded in this research.

**Rank B.** Eight were planned where a degree of refit and enhancement could be undertaken in the future to meet the criteria proposed.

**Rank C.** Six corridors were deemed to be in the situation where we doubt it would be practicable or economic to widen or improve the alignments sufficiently to enable the route to meet the transport future proofing, planning and environment criteria. They would need to have a major rebuild or another parallel corridor would need to be constructed alongside to relieve the existing facility. Either way the outlook was 'grim' with no opportunity for significant ongoing improvement.

Grouping the 24 corridors according to road type of motorways, expressways and arterial road transportation corridors the score board in this investigation resulted in the following summary:

Nos 1 to 7. Seven corridors fall in the multi-modal category: four in Auckland and three in Wellington. All these are ranked A or B and have been the 'flag ships' of New Zealand motorway experience and they all share rail corridors or are alongside them.

Nos 8 to 12. Five are single purpose urban motorways. Of these, three are ranked A and appear to have the potential for being future proofed. However there are two ranked C which have only a 45m right of way and will be incapable of future proofing and moving to a multi-lane or a multi-modal function in the future. These are both at the proposal stage and could still be enhanced.

Nos 13 to 15. There are three rural motorway/expressways currently proposed and one just completed. All are links in SH1 (Hamilton, Taupo and Transmission Gully) and all are in open rural type situations enjoying high geometric standards, a wide right of way and strict access control. These are all ranked A.

Nos 16 to 18. These are three rural expressways, all existing roads, which have been subject to upgrades. There is one in each ranking of A, B and C. The lower ranked B and C warrant retro-fitting.

Nos 19 to 24. The remaining six are major urban arterials. Of these, all are existing routes. Only one is ranked A (Te Irirangi Rd) and the rest, not surprisingly, are ranked B or C.

More details of the assessment process are included in appendix E with a summary describing the circumstances.

## 7.5 Broad conclusions from assessments

A broad summary of some key issues drawn from the results of the assessments is as follows:

- 1 In making these assessments we acknowledge that the ranking shown was a subjective process relying on the joint view of the two researchers and was largely made from a planning (not an engineering) perspective.
- 2 The high-level and subjective assessments made here have raised some very important policy issues including:
  - the need to identify future major multi-mode corridors early and recognise them in RLTSs and district plans.
  - the need to consider the environment across a corridor footprint of say three times the right-of-way width.
  - the need for some existing corridors to be widened and retro-fitted to enable future proofing
  - the need for earlier property purchase strategies for all major transportation corridors
  - the need to review property purchase responsibilities and treat the corridor purchase as a planning issue
  - the need to provide for a ‘corridor protection zone’ in district plans
  - the desirability of having more inter-professional training on integrated corridor planning
  - the need to review the RMA section 166 etc designation provisions and remove the RMA section 182 default clause.

These aspects are integral to future planning for transportation corridors and community structures.

- 3 Planning and protecting inadequate motorway corridor widths is one of the greatest handicaps to quality, multi-modal public transport, future proofing and the early purchase and construction of major motorway corridors. Unfortunately there appears to be a tendency for current new designations, now being proposed on state highways, to have even narrower rights of way which fall short of those needed for future flexibility, future proofing and environmental standards.
- 4 Three proposals have been identified as providing an excellent opportunity to achieve a widened corridor and give an ‘in-perpetuity’ solution with ability to future proof for additional lanes, special purpose lanes including bus ways together with an integrated land-use and landscape environmental treatment. These projects (including Hamilton’s Ohinewai to Cambridge Waikato Expressway, Taupo’s Eastern Arterial Expressway and the Transmission Gully Motorway) all have the opportunity of a wide right of way, 100m plus, and they are motorways/expressways located around the edge of the urban area with space and separation from adjacent suburban development. There is no need for rail on any

of them at this stage; however, we are not sure about the future rail potential for the Eastern Taupo Arterial north of the Centennial Drive industrial zone.

- 5 None of the projects assessed provided for future six-lane traffic, and exclusive bus, HOV and trucking lanes with the possibility of also accommodating heavy or light rail tracks. It also appears that no RLTS has yet included any proposal of this type. This is a style of development that could be expected to emerge in the strategic plans for both the re-developing and the expanding urban areas for major arterials in the near future and for major multi-mode arterial corridors in the longer-term future.
- 6 The major urban and inner rural arterials are proving to be the most difficult group of roads to adapt and re-develop successfully to match their ever present and increasing future traffic functions. However both existing and new expressways and major urban arterial roads can, with effort, be planned successfully as shown by two of the routes considered here (Te Irirangi Drive in Manukau and Queen Elizabeth Drive in Christchurch). Many arterials fall well short and a much greater effort to achieve widening (from 20m - 30m to 40m - 60m) through amended designations, control of conflicting land uses, access management, AMSPs, landscaping, urban design, cycleways and good traffic engineering solutions is required to successfully undertake these enhancements of existing roads in the future.

## 8 Property purchase and designation issues

### 8.1 Forward property purchase

The major single impediment to successful outcomes is adequate property purchase.

Forward property purchase is a much more important issue than just buying a piece of land for a road. Strategically the identification of these corridors is fundamental to the regional development and regional planning process. It is also a pre-requisite to establishing the transportation corridor and without that forward purchase, sometimes 30 or 50 years in advance, the corridor may never be established. Compensation for very early purchase of land well in advance of construction is a budget encumbrance not currently favoured or met by transport authorities (NZTA and RCAs).

The inclusion of the costs of property purchase in the road authority's construction costs for a new transport facility is not logical. Land for major transport facilities adds to the total public estate and can be assumed to have a 100-year discount in contrast to construction and material costs with 10- and 20-year discount periods. Another result is that the RCAs tend to avoid expenditure on early property purchase in favour of lesser works on existing public road reserves. Major property purchases (ie land for future public use) are best managed as a planning authority matter through a regional rolling 'property bank'. The need for early purchase is very real, but this process is in a different time frame (over 30 to 50 years) from the scheme planning, design and highway construction process (3 to 10 years).

As early as 1971 it was identified that more motorway and road corridor proposals would fail in Christchurch because of poor land purchase arrangements and poor landlord management of the land in the intervening 20 to 30 years, than because of poor transportation and planning analysis or inadequate engineering design. At that time the property was held by the Crown. Today it appears that this type of early land ownership and land management might best be undertaken by the regional council or the city/district council as a planning authority. It does not appear to be an appropriate imposition on a network utility operator or a road controlling authority.

This present research suggests it would be best, at least for the long-term future resumption of multi-purpose corridor lands, if the road controlling authorities were excused the responsibility of undertaking the initial corridor purchase and councils (regional and city/district), as planning authorities, would undertake the responsibility to 'resume the land for corridor purposes in the public interest'. This would avoid the need for NZTA/HNO and RCAs to budget for the major corridor property purchases many years ahead of need.

The property ownership and management of the land, in the pre-construction period, may include a range of temporary residential and other uses. Council ownership and management should avoid the stigma and accusations of 'urban blight' from those not in favour of such bold corridor planning policies.

Regional funding of property pre-purchase for motorway and multi-modal corridors will require new policies and financial commitments and arrangements. If the land is pre-purchased (say 30 years ahead of construction) to add to a regional 'property bank' then the ownership would transfer to the planning authority for management in the meantime. This may involve lease back or leasing for other interim users. These lands would be transferred to the corridor construction authority/road authority at the appropriate time three to five years before construction.

This is a significant change from current institutional practice. It will require a quantum rethink of this vital step in corridor planning. The statutory provisions in the RMA and the Public Works Act 1981 will

need to be extended and amended to enable this framework for local government interim purchase and management.

## 8.2 Integrated planning and land purchase

Examples of poor integration of planning related to road corridors are not uncommon. The planning objective is to reconcile the footprint of the corridor with the surrounding environment and seek a better relationship between the houses and properties left alongside the new motorway or widened arterial roads. This requires the roading authority and the planning authority to act together. This has occurred with good examples, eg in Manukau: Te Irirangi Rd (1990s) and Christchurch: Brougham St (1970s) and Fendalton Road widening (1980s).

Regrettably the tendency in the past has been to define the road widening or determine the property boundaries and fence line first and then squeeze the traffic lanes, footpaths and amenity areas into the narrowed road reserve that results. There is little doubt that the designation process would be more acceptable if at the time of concept planning an integrated approach considered issues such as community severance, local traffic, cycle and pedestrian links, traffic noise generation, front yard space, adjacent buildings and general landscape patterns as part of the whole environment. Many of these features, however, would suggest the need for wider corridors and it is probable that future designations will need to be wider to accommodate all aspects and end up with a satisfactory environment.

Sustainability would dictate that such road improvements, including motorways, are only acceptable if the environment improvements outweigh the disturbance and loss of space absorbed by the transport facility. This suggests that the balance sheet of costs and benefits related to the transport improvements should be complemented by a balance sheet of environmental gains and losses. This is another reason why transportation corridors, the subject of this research, must be ample and sufficient within an integrated planning framework that includes satisfactory planning for the outer third of the footprint.

There can also be issues about the staging of construction of corridors in relation to local amenity. During the early days of a project the corridor may appear generous with a good standard of local amenity and offering a pleasant driving experience. However, when the corridor is narrowed to a minimum, then concrete retaining walls and tall wooden noise barriers end up as the inevitable compromises due to a lack of forethought and integrated planning.

## 8.3 Need to amend designation legislation

The designation technique with its Notice of Requirement procedure has been extensively used over the past 40 years to gain approval and protect future roading corridors from development pending the start of actual construction. This technique was carried forward from the previous Town and Country Planning legislation into the RMA and relies ultimately on purchase under the Public Works Act 1981. Designations have worked reasonably well for incremental road widening and road lengths for immediate construction.

Road authorities have used this process and it can:

- protect the proposed route from works that could impede later construction
- give public notice of the intention to build a road
- provide the means of gaining planning approval for the proposed road
- provide entry into a mechanism that allows property purchase matters to be resolved in an open and deliberate manner.

Once designations are included as provisions of a district plan they effectively override other district rules on that land to the extent that any activity must not prejudice the work proposed in the designation.

There may be conditions requiring submission of an outline plan of the proposed work for approval by the council prior to commencing construction under an approved designation. Designations have become firmly associated with short-term (five-year) protection and property purchase related to scheme planning processes and construction.

While the designation process is well suited to minor and immediate network improvements, they should not be seen as the first and only step in the process. There is need for earlier warning especially for major corridors. Designations are not entirely appropriate as the mechanism for long-term (20 to 50 year) time frames required for identifying and planning transportation corridors, especially multi-modal and mixed-use corridors as envisaged in this research.

The process of establishing a designation, arranging purchase and management of the lands over a long period and negotiating with owners is at present too brittle and short term in planning terms and warrants a major review. There is a serious need to rationalise and make such provisions part of longer-term planning instruments and not subject to political whim or expedient short-term abandonment. This is not an area which should be subject to the risk of passing fashion and fickle political change. These are the future arteries necessary to sustain regional development strategies and essential growth and redevelopment of our metropolitan areas.

Two excellent papers by Hassan, *Current approaches to transport corridor planning in New Zealand – the role of designations* (Hassan 2003) and *Sustainable highway management* (Hassan 2007) set out the advantages and pitfalls of both the limited access and designation processes. He outlines the poor integration between the four different agencies and the strategies involved and stresses the advantage of a national policy statement for this process. Hassan encourages the use of a wider range of tools including joint agreements outside the existing processes, pointing out in particular that the processes of compulsory purchase are too late, too little and frequently left to needlessly await RMA Environment Court decisions.

As a general rule effective corridors will require a redevelopment of the land uses along both sides in the adjacent rural, residential, commercial and industrial areas. This added area can usefully be redeveloped and frequently a council's land purchase and redevelopment balance sheet, at the end of a 30-year period, is in credit. This residential and industrial renewal and redevelopment involves both public and private sector development processes and a long-term planning framework.

The researchers have concluded that the designation process should be reviewed, as the present designation provision is not entirely appropriate for long-term (say 20 to 50 years) protection of future transportation corridors. It is apparent that some additional means of corridor protection is needed – an outcome of this research is that a corridor protection zone should be included in district plans.

## 8.4 Proposed corridor protection zone

While designation will continue to be the mechanism for specific minor road widening and imminent road reserves and other public spaces, there are difficulties with the current legislation that need to be addressed. For long-term projects, say construction starting in 30 years (most roading corridors are long term) there is a mis-match in the RMA which is the five-year default clause. This clause should be revoked so that any period appropriate to the particular proposal can be stipulated from the outset.

Designations are devised for single-purpose utility authorities; however, the protection proposed in this research is multi-purpose involving two or more authorities and as such a zone would be a better model for the participation of several agencies than a single function designation.

The objective is to identify a proposed zone arrangement that in due course, say 30 years, would lead to a negotiated purchase on behalf of several agencies. The zone would prevent incompatible development that could obstruct the proposal in the interim period. In addition the zone should give confidence that regardless of the surrounding circumstances, the number of agencies which might be involved and consideration of valuations and property issues, the land was identified early and would ultimately be available for use for corridor purposes.

This research concludes that a zoning approach is superior for longer-term proposals than the present reliance on designations alone. It would:

- allow an earlier commitment to the proposal
- provide flexibility and a fairer basis for negotiation between the land owner and the council as planning authority
- enable the identification of a wider and superior corridor provision.

Zone rules need to be developed that would enable a staged purchase and would better match the great variety of circumstance surrounding the proposal, as well as allow the interim use of the site by an owner or an occupier.

This zoning technique would have been much more satisfactory as the basis for long-term corridor planning and property negotiations at many locations, eg the Basin Reserve area in Wellington, the sand dunes motorway at Kapiti (where a 100m corridor was established in 1975 and still awaits the expressway construction), St Albans/Cranford St in Christchurch, the Tram Road expressway in Hamilton, Eastern Motorway in Auckland, St Vincent St southern outlet in Nelson and many others, where the time frame for the 'gestation of the proposal' has spanned out over 30 to 40 years. During the whole of this time there has been little doubt that ultimately the project would go ahead.

The zone statement should include objectives, policies and rules requiring the planning authority to purchase the corridor on reasonable terms so that the owner can sell at any time to the planning authority at a negotiated price. These provisions assume the council will, at a mutually convenient time in the future, be a willing purchaser. A draft outline of the headings and provisions in such a zone is included in appendix D.

Overall, the message is simple – integrated planning for long-term proposals including collaborative agreements between agencies must become the order of the day. In addition the designation procedure needs to be reviewed and improved. For long-term planning of transportation corridors, designations should be replaced by a corridor protection zone in district plans. This should enable all agencies, other parties and property owners to proceed in unison with the long-term planning for transportation and open-space corridors, and sympathetic treatment and development of the adjacent community structures.

## 9 Conclusions, key issues and recommendations

The identification of major long-term land transportation corridors for all modes of travel is essential to regional strategic planning and developing a sustainable transport system. Such corridors also provide a framework for an integrated regional urban growth pattern and improved community structures. This research explored the merits and the difficulties of integrated planning for such multi-purpose corridors within the current institutional arrangements.

The research also provided a historical review and commentary on 50 years of the transportation corridor experience in New Zealand and an overview of the responsibilities of the several agencies involved, especially the NZTA, regional and city/district councils, in planning for major transportation corridors.

In order to inform this research project a general assessment of 24 major transportation corridors (18 motorways and expressways) and six urban arterial roads in the three metropolitan areas of Auckland, Wellington and Christchurch, was undertaken in 2005–07. These studies included a history of the life and mixed fortunes of several of these corridors where, in spite of extensive and comprehensive transportation planning studies undertaken in the 1960s and 1970s, several of the projects have still not been built and remain as unfinished business. Even when there is proven merit, the politics of decision making and budget limitations of funding have prevented their implementation.

### 9.1 Cooperative joint programmes

For significant strategic transportation and land-use investigations, good analysis, modelling, economic studies, urban development plans and reliable scheme assessments are essential. These are best undertaken as joint integrated programmes by multi-disciplinary technical teams which are in turn backed by joint cooperative multi-level study groups. This can only occur when there is agreement to continuing collaboration and an integrated approach pursued at all three levels of government and by all the agencies directly involved.

Professionally the work is undertaken by engineers, landscapers, urban designers, environment/resource planners, economists, regional and district planners. Somehow this rich technical harvest of information must be reported in an effective manner that enables all the agencies to consider the evidence, including its presentation to the public and also as evidence to the Environmental Protection Authority or the Environment Court.

Ultimately the financial implications, the scale and the community effects are of such a scale that the adoption of whole corridors and the motorway/expressway/arterial projects are very significant governance decisions.

### 9.2 Integration at all levels

Integration is accepted as singly the most important philosophy relevant to corridor planning. It occurs through interdisciplinary and inter-agency collaboration over the whole planning process at:

- strategic planning: long term 30 to 40 years
- scheme planning: medium term 20 to 30 years
- project planning: short term 10 to 20 years
- implementation planning: immediate term 1 to 10 years.



Integrated planning endeavours to reconcile the following four high-level relationships of:

- the relationships between ‘community structures’, ie urban form, growth strategies and the development of urban rooms placed between the major transportation corridors
- the relationship between transport routes, abutting land uses and transportation corridors
- the relationship between transport functions within the corridor and the spaces provided for vehicles of all types, public transport, active modes and safe areas within the landscape
- the relationship and accessibility between regional network links and local networks and accessibility outside the corridors while enabling suburbs to be free from extraneous traffic.

Integrated management requires joint collaboration to reconcile assessments and planning, at and between national, regional, district and neighbourhood levels.

Thus the success of transportation corridors and urban form as envisaged here requires the strategies to be agreed at all four levels, so securing a top-down authority and bottom-up support. In this way the regional transportation strategy relates the national policies and funding to the planning and transportation issues facing each region. It also requires leadership, integration and consistent application by engineers, planners, landscape architects and other professionals in the planning and development of the proposals.

### 9.3 Projects investigated and outcomes

In order to gain an overview of the successes or failures of past transportation corridor planning 24 lengths of existing or proposed transportation corridors were studied. Of these, 12 are motorway corridors, six are expressways (some of which have not yet been built) and six are arterial routes in urban settings. All of the corridors selected are key links in the essential spine of their respective regional networks.

After describing the nature of each project, the research first assessed the 24 corridor/projects against the four major dimensions of transportation planning: planning, landscape and land use, urban form and traffic accessibility. The summary of the projects, their assessment and outcomes are set out in table 7.2. These outcomes show that half of the sample scored ‘good’. The other half in the ‘fair’ and ‘poor’ categories require some enhancement to be future proofed and to improve their environmental qualities. This could include widening the right of way for additional lanes, accommodating special lane functions and/or travel modes, and also enhancing landscaping with a widened corridor from adjacent areas.

The results tend to reflect positive traffic, engineering and landscaping dimensions where excellence is understood in the design office. However, over half of the projects considered failed to meet regional planning, community structure, future proofing and environmental objectives. For this group these dimensions appeared not to have received sufficient attention in the initial scheme planning and early design stages.

### 9.4 Experience 50 years on

Since the first motorways were constructed in Wellington and Auckland in the mid-1950s, the case for major transportation and joint purpose corridors has steadily increased and is compelling. They represent the best use of these public open spaces, good economic planning and also bring together some of the ‘reverse sensitivity issues’ into one corridor or one set of boundaries, so reducing the number of residents exposed to their effects. It is regretted that over the past 50 years many excellent opportunities for combined multi-modal and multi-functional regional corridors have been lost due to a lack of integrated

and coincident planning. Such major corridors must be established as a regional strategy enjoying both technical and political support, and requiring consistent and long-term commitment.

The preparation, adoption and implementation of such transportation corridors and associated community structures require a range of decisions and actions which include the following:

- 1 The community must be convinced of the need for the continuation of such major projects as part of balanced regional and district urban development planning. Without community commitment opportunities will continue to be lost.
- 2 The responsible agencies should be able to assure the community that all the incidental matters including expansion of public bus transport, possible rail public transport, the management of parking and park and ride, and traffic demand management have all been investigated and are being pursued in parallel with the major transportation corridor developments.
- 3 The officers and consultants must maintain high corridor cross-section and space standards and best practice so the community is satisfied the designs are adequate and future proofed and the work is undertaken as integrated projects adding to the urban landscape, environmental standards and urban form, as well as serving their transportation functions.
- 4 These major corridor projects must fit into a total picture of regional development bringing with them significant environmental benefits and they must be shown to be good neighbours for future residents who live and work alongside as well as for the benefit of urban design for the wider community.
- 5 Collaboration between all agencies over many years (20 to 50 years) is necessary at every stage from the initial planning to the implementation, including meaningful community consultation. This collaboration among all the public agencies is a pre-requisite to successful major corridor proposals and development.
- 6 The management and programming of property purchase must be reliable and continuing. There are logical arguments, in the case of long-term future corridors planned for 20 or more years into the future, that the regional and/or district councils should be the interim custodian of the corridor lands. As the responsible planning authorities, they should play a role in selecting the corridor and also in purchasing the land in the interim pending its later use by the road authority.
- 7 There is a need to strengthen RLTs so as to introduce a nationally agreed road hierarchy definition and also to explicitly define and commit to the ongoing development of the major transportation corridors in each region as a means of supporting both long-term urban development and the major future single and multi-purpose transportation networks.
- 8 The RLTs should draw a separation between information/policies on land purchase for the immediate planning (1 to 10 years) and those made to secure land for selected transportation corridors in the medium term (10 to 30 years) and strategic planning urban development objectives and corridors for the longer term (30 to 50 years).
- 9 There is a need to review and rationalise the basis and the process of corridor protection and designations under the RMA. This includes establishing a proposed long-term corridor protection zone for the protection of existing and future transportation corridors in the respective district plans. It also includes the removal of the five-year default clause from the designation provisions of the RMA and its amendments.
- 10 Public officers and consultants in the engineering and planning professions involved should be supported by more professional development and training in the realm of multi-functional and shared

corridors as part of a changed approach in future planning of these major facilities and their associated open-space and land-use areas.

## 9.5 Recommendations

The NZ Transport Agency, the Ministry of Transport, the Ministry for the Environment and the Department of Internal Affairs are the government agencies which are central to policy and legislative changes necessary to the issues raised in this research. In addition, Local Government NZ, and regional and city/district councils are also directly involved in agreeing to the need and providing support for any agreed changes. All these agencies are asked to consider and adopt the following seven recommendations.

- 1 In order to facilitate earlier land purchase of transportation corridors it is proposed that each region establish an ongoing regional (and/or district) rolling property fund to enable such early purchases. In the national interest this should be partly funded by the government.
- 2 With respect to access provisions on key arterial roads, especially near growing urban areas, the NZTA and councils are recommended to immediately prepare access management structure plans for inclusion in all district plans at the next convenient review.
- 3 The designation default clause of the RMA (section 184A) of five years should, in the case of transportation corridors, be removed from the Act.
- 4 There is a need to review the process of corridor protection and designations, under the RMA. This includes establishing a proposed corridor protection zone' for the long term (over 20-year) protection of existing and future transportation corridors.
- 5 A proposed draft corridor protection zone should be prepared, complete with objectives, policies and rules, as a model for those councils who have a need to include such a provision in their regional/city/district plan.
- 6 The planning authorities (councils) should in future take responsibility for the early (ie long term over 20 years) land purchase and management of all property 'resumed for future transport corridor use'. They should hold and manage that land until such time as it is required by the road/rail and infrastructure agencies for the staged construction of the future projects.
- 7 The transport sector and appropriate agencies are asked to extend training, workshops and conferences to encourage good multi-mode and multi-function corridor planning practice for senior planners, engineers, landscape and other designers, so as to build up a joint culture of inter-professional and inter-agency understanding related to transport corridor planning.

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## Appendix A: Legislative basis and content of RLTS

### A1 Legislative basis for the regional land transport strategy – Land Transport Act 1998

The strategy is prepared under the Land Transport Act 1998 (LTA). This Act states that each regional council must set up a regional land transport committee (RLTC) which will prepare a regional land transport strategy (RLTS) for approval by the regional council.

Section 175(2) of the LTA states:

Every regional land transport strategy prepared under this section must:

- (a) Identify the future land transport needs of the region concerned; and*
- (b) Identify the most desirable means of responding to such needs in a safe and cost effective manner, having regard to the effect the land transport system is likely to have on the environment; and*
- (c) Identify an appropriate role for each land transport mode in the region, including freight traffic, public passenger transport, cycling, and pedestrian traffic; and*
- (d) State the best means of achieving the objectives referred to in paragraphs (b) and (c) of this sub-section; and*
- (e) Include any regional passenger transport plan (within the meaning of section 47 of the Transport Services Licensing Act 1989) that has been prepared by the Regional Council that has prepared the strategy.*

A RLTS has effect for a five-year period and must be reviewed at least every two years and may be renewed from time to time.

Nothing in a RLTS may be inconsistent with any regional policy statement or regional plans prepared under the Resource Management Act 1991 (RMA). Under the RMA, district plans shall have regard to the RLTS.

The Land Transport Safety Authority (LTSA), Transfund NZ, Transit NZ, Commissioner of Police and Ministry of Transport (and territorial authorities) must ensure their actions are not inconsistent with RLTSs.

### A2 Extended range of matters in RLTS needed to meet Land Transport Management Act 2003

The requirements of the LTA 175(2) are expanded by the amendments in the Land Transport Management Act 2003 (LTMA 2003) to include:

175(2) Every Regional land transport strategy must:-

- (a) Contribute to overall aim of achieving an integrated, safe, responsive and sustainable land transport system.*
- (b) Take into account how the strategy assists/improves/ensures NZTS objectives.*
- (c) Take into account any NLTS and NEECS.*
- (d) Take into account the land transport funding likely to be available in the region.*
- (e) Avoid to the extent reasonable adverse effects on the environment.*

- (f) Take into account views of affected communities.*
- (g) Take into account views of land transport network providers (who are these???)*
- (h) Take into account the need for those preparing LTS to give early and full consideration to alternatives and options especially with reference to (e) and (f).*
- (i) Encourage early and full contributions by stated groups.*
- (j) Identify an appropriate role for each land transport mode.*
- (k) Include any regional passenger transport plan – see licensing Act 1989.*
- (l) Identify outcomes for the region and strategic options for achieving them.*
- (m) Identify any strategic options where co-operation is required with other regions.*
- (n) Identify those parties to be involved in the further development of the options.*
- (o) Include a demand management strategy, targets and timetables for the region.*
- (p) Provide for the strategy to be independently audited.*
- (q) Take into account any guidelines issued by the Minister.*

176(1) A regional land transport strategy

- (a) must at all times be kept current for a period of not less than 3 years in advance but not more than 10 years and*
- (b) may be renewed from time to time, and at least every 3 years.*

### A3 Summary of issues which should now be covered in a RLTS

The advice to assist with RLTS/LTP preparation could include:

- statement of conditions/trends/forecasts/issues in the region
- statement of objectives
- engagement – consultation/discussion, information, collaboration all parties
- description of how the strategy/plan/programme was developed in terms of approach methodology and appraisal framework inclusive of all modes, the alternatives and options considered, and classification of transport networks
- effects in terms of outcomes, energy efficiency, safety, responsiveness, effectiveness, confidence, cost/feasibility/implementation issues and linkages to other related issues such as land use, growth, equity, social inclusion
- assessment of contribution to objectives, outputs and effects (eg integration, sustainability, safety) on both the regional and the district scale
- reasoned statements, references and evidence in support of the above
- monitoring and performance indicator programmes
- a regional planning horizon of 20 to 30 years, local programme for 10 years.

## Appendix B: Christchurch extract from landscape report (Turbott 1968)

### B1 Report to Christchurch Regional Planning Authority: summary

HA TURBOTT, September 1968

#### **General:**

The vast increase in power and performance of the vehicle and the increasingly high standard of geometric design has made man the weak link in the motorway system.

Appearance of a motorway is a critical factor in conditioning the driver's responsiveness, and hence the efficiency and the safety with which the driver uses the motorway.

**Christchurch motorway:** The Christchurch motorway will be the first of its kind in New Zealand.

The flat Canterbury Plain creates a different design problem to that encountered in the hilly cities of Dunedin, Wellington and Auckland.

The lack of vertical relief will add monotony to the repetitive uniformity of geometric standards of the motorway.

**Compensation for lack of varied relief:** Unless some provision is made in the design to counter this monotony the Christchurch motorway will be less efficient, have a higher accident rate than is necessary, and have a more destructive effect on the surrounding area, than is the case with other motorways in New Zealand. Extra care and effort is necessary if Christchurch is to provide at least the same standard of motorway as already exists in Auckland and Wellington.

**Three important aspects of motorway design will reduce maintenance costs,** enhance its value as a landscape feature, and fit it more readily into the activities of the community.

- 1 Design for machine maintenance not handwork
- 2 Design in a pseudo-natural form, eg the wilder sections of Hagley Park or the deliberate creation of wildlife areas, where a very low standard of maintenance is appropriate and attractive
- 3 Design for multiple use, air space and under space use.

Multiple land use would take the following forms:

- Rural sections: cropping in conformity with the surrounding uses and/or forestry with crop trees interwoven with decorative trees
- Suburban sections: use of right-of-way width to provide access roading, with tree-planted berms, to the adjoining properties
- Urban section of elevated motorway: redevelopment of the land under and over the elevated structure to provide a revenue producing land use compatible with the motorway and the adjoining areas, ie a roof top motorway.

Not only will this allow land that would otherwise be sterilised by the motorway to be put to use, it would also produce an income. If well applied the multiple use principle would eliminate the problem of 'fitting in' to the landscape as it becomes a properly integrated and functioning part of the landscape.

Multiple land use requires a much more comprehensive approach to design, and careful control if it is to perform satisfactorily its multiple functions.

**Alignment of the motorway:** The present proposed alignment provides as much opportunity to create outstanding landscape features as can be expected from such an even base.

**Corridors of control:** The principles of multiple use together with the impact of the motorway on its surroundings, and the effects of near and far views from the motorway, make necessary changes to the concept of standard rights of way.

Corridors of control and areas of interest vary when considering central compared with suburban or rural motorways. The following four groups of factors require different corridors of design:-

- 1 Construction width only (engineering right of way)
- 2 Treatment of motorway (internal motorway landscape development)
- 3 Corridor for control of building development (an area planned to include a buffer zone and ensure adjacent redevelopment is satisfactory)
- 4 Areas of visual and amenity control includes:
  - a recognition of distant views
  - b adjacent landscape character
  - c adjacent advertising and structures causing conflict.

This report deals chiefly with item 2, in respect of the motorway landscape compartments; item 3 relating to redevelopment and landscape treatment immediately adjacent to the motorways and for item 4, the potential of more distant views, especially in the rural and elevated central sections of the motorway system.

The recognition of these factors at this planning stage will result in a more positive approach to motorway design. It would allow sufficient right of way to be purchased in the right places to allow for the inevitable increases in design standards which will occur during the planning and building of the motorway. It will be less arbitrary than purchasing a 'standard' width with the resultant skimping in some areas and surplus land in others.

HA Turbott

September 1968

## **Appendix C: Hearing recommendations – Wellington western corridor 1998 and 2006**

### **C1 Proposed Wellington western corridor planning**

#### **C1.1 Proposed SH1 urban (Mana) section upgrade**

##### **(a) 1998 – Recommendation of commissioners**

26 June 1998

In summary, we accept the urgent need in the national and regional interest to improve conditions along the Urban Section of SH1. However, we think that the Upgrade as the particular means for achieving the increase in capacity would have serious adverse environment effects. The Upgrade is so deficient in so many respects that it is inconsistent with the purpose of sustainable management. It fails to sustain the residential environment of the community through which it passes so it does not meet the reasonably foreseeable needs of present and future residents of the area. It would not avoid, remedy or mitigate adverse effects on the urban environment. It would exacerbate adverse effects which are already unacceptable and it would do so for an indefinite period of time. The Upgrade would be too tight a fit in the narrow road corridor. This would result in higher than acceptable costs being imposed on residents individually and on the community as a whole.

We recommend that the requirement in the NOR for the Upgrade be withdrawn.

#### **C1.2 2006 recommendation WRC Hearing Sub-Committee's report**

**March 2006**

The Sub-Committee's Findings:

- 1 The Sub-committee has found that the affected communities do not support the Coastal Route Upgrade elements of the WCP and have expressed a strong preference for the TGM alternative. The Sub-committee has found, having regard to all of the provisions of S.175 of the LTA, including, in particular the views of affected communities and the need to avoid adverse effects on the environment, that the proposed WCP should be amended to better accord with the provisions of the LTA, the New Zealand Transport Strategy, the provisions of the LTMA, the earlier public commitments of Transit and others, and the land transport funding likely to be available to the Region.
- 2 We believe that amendments to the WCP based on our findings of community views would lead to a plan for the Western Corridor that will contribute to an RLTS able to serve the Region well into the future. Such a WCP, and such an RLTS, would give confidence to the Region that its transport problems are being recognised and addressed as resources become available.
- 3 The approach we have taken addresses the dilemma between the purposes of the LTMA with its new focus on achieving an integrated and sustainable land transport system (on the one hand) and the current funding regime and criteria that is perceived by many to apply approaches associated with the previous statutory regime for land transport.
- 4 In coming to our findings, we have been made aware of, and taken into account, the special Crown funding opportunities presented by Government. We recognise the considerable constraints that the land transport funding likely to be available places on the range and extent of investment that can be made in the Western Corridor. We are also aware that there are practices and rules in some agencies

around benefit-cost ratios (BCR) that might appear to present a barrier to the investment in strategic, long-term and expensive infrastructure.

- 5 Based on advice received from Land Transport NZ, in our view the current allocation rules and practices, which reflect the provisions of the LTMA 2003, are more flexible than commonly perceived but may need to be reviewed if they present a barrier to the accomplishment of critical, strategic and special projects. We see no legal reason why the historic emphasis on benefit-cost ratios should prevail where they inhibit meeting the purposes of the LTMA for an 'integrated, safe, responsive and sustainable land transport system'.

#### **Need for a strategic view**

- 6 Submitters raised issues of funding and the problem of historic under-investment in strategic infrastructure over many decades. They expressed concerns about the negative impact of focusing upon 10 year funding programmes and the continuing application of a 10% discount rate when valuing transport investment for long-term, strategic, expensive infrastructure projects. They expressed concern at the failure to appropriately value infrastructure resilience. They submitted that achieving the purposes of the LTMA 2003 required a longer term horizon in planning and funding than ten years. They encouraged an approach, more akin to best practice internationally, where major roading and transport infrastructure projects are being discounted in line with a life expectancy in excess of 50 years.
- 7 The evidence of expert submitters is that international best practice uses discount rates of around 3.5 percent rather than the 10 percent prevailing in New Zealand. Their evidence shows that using that discount rate over a realistic period for long-term infrastructure investment would generate a benefit-cost ratio for TGM of in excess of 1.0 Similarly, if the value of resilience was taken into account and some of the calculations around contribution to gross domestic product (GDP) were properly refined, we believe that the benefits of TGM would be seen to be even more pronounced.
- 8 There are real and present problems of reliability, congestion, community severance, safety and adverse environmental effects arising from current use of existing roading alignments in the Western Corridor, and these problems are projected to deteriorate. There is a strong perception that these problems are stifling regional and national economic activity. In our view, undertaking TGM will have significant economic and productivity growth benefits, it will also reinforce a hierarchy of roads that separates local traffic from the inter-regional traffic, a separation which Transit, in line with international best practice, has attempted to promote elsewhere.

#### **Role of passenger transport**

- 9 Some submitters were of the view that the time had arrived to shift the focus of land transport expenditure from road to other forms of transportation, particularly train and buses, to obtain a better rail/road balance of capital expenditure. There is no doubt that further resources should be applied to upgrading and extending public transport facilities. There are real opportunities for rail and bus services to be improved in the WCP and our amended programme includes them. However, there are major deficiencies in the current roading network that need to be addressed as a priority. The problems along the corridor are much wider than the peak commute demand.
- 10 Submitters argued that the Region has unusual geographical and topographical characteristics that limit the range of options to improve its roading infrastructure, and making unusually expensive any serious attempt to fix infrastructure problems that there has not been enough commitment in the past to solve. Those problems also affect the rail infrastructure which, like the current SH1 between



Pukerua Bay and Paekakariki, is very fragile in parts. We heard evidence to suggest that expenditure in excess of \$1 billion would be required to bring rail services in the Region up to a modern standard.

Whilst submitters were clear in their support of improved rail and increased investment in public transport, they were also clear that rail and buses alone would not solve the Region's freight and people transport problems nor ensure the integrity of the national road transport network.

### **C1.3 Extract from minutes of Regional Land Transport Committee meeting of 11 April 2006**

#### **Matters for decision – RLT 83 Western Corridor Plan – resolved (Cr Buchanan/Cr Evans)**

That the Committee:

- 1 Adopts the Western Corridor Plan (April 2006) as amended as set out in Attachment 2 of this report.
- 2 Recommends that Greater Wellington Regional Council amends the Regional Land Transport Strategy by replacing the Western Corridor Plan Implementation Plan (1999) with the Western Corridor Plan (April 2006) as amended.
- 3 Notes that Transmission Gully should not be funded at the expense of other transport and reading projects required to meet the transport needs of all communities in the region and ensure their future growth and prosperity, in particular:
  - a Projects in the Ngauranga to Airport corridor.
  - b The proposed Grenada to Hutt Valley link.
- 4 Recommends that enduring regulatory land use controls and other mechanisms be introduced by relevant local authorities, potentially including land ownership and binding access limitations to avoid generating urban sprawl.
- 5 Recommends that Greater Wellington Regional Council urgently investigates mechanisms for travel demand management to avoid adverse impact on passenger transport patronage, including the investigation of congestion charging on the Western Corridor.
- 6 Recommends the early implementation of passenger transport projects in advance of the completion of transmission Gully, to help ensure public transport patronage is maintained and enhanced.
- 7 Requests the Regional Land Transport Committee to consider seriously how to respond to the clear scientific threat of climate change.
- 8 Requests that the Regional Land Transport Committee, with the support of Government agencies, develops a case for new funding criteria to determine how "critical, strategic, special and national" projects can be funded.
- 9 Establishes a deputation, led by the Chair of the Regional Council, comprising of the chair of the Regional Land Transport Committee and the region's mayors, to undertake discussions with appropriate Government Ministers to resolve uncertainties in funding the Western Corridor Plan, and to report back to the Committee.
- 10 Notes that the Western Corridor Plan has to meet the legal requirements set out in S.175 of the Land Transport Act 1998. and be consistent with the Regional Land Transport Strategy.
- 11 Notes the concern that the Western Corridor Hearings Subcommittee's Report does not adequately address these requirements with, respect to environmental sustainability and the environment, and with respect to the New Zealand Transport Strategy, the National Energy Efficiency and Conservation

Strategy, the Regional Policy Statement and the Regional Land Transport Strategy and requests further information.

## C1.4 Addition to the 1999–2004 Wellington Regional Land Transport Strategy

### Western Corridor Implementation Plan

The Western Corridor runs from Otaki to the Ngauranga Merge. It generally follows the line of the current State Highway One and the North Island Main Trunk Railway from Otaki to Wellington. The 1999–2004 Wellington Regional Land Transport Strategy includes the following project:

‘Develop a Western Corridor Implementation Plan that includes both road and rail and identifies the optimum package for the corridor.’

What follows is that plan. The technical support for the plan can be found in a companion report, ‘Western Corridor Implementation Plan Report of the Technical Group. 10 April 2000’. The technical report is available from the Regional Council.

### The Plan

Undertake the following roading and public transport projects in the corridor during the period 2000–2004 (note : projects not already included in the Regional Land Transport Strategy are marked accordingly and all \$'s are set at 1998 values).

### Roading

- Construct a new two lane bridge at Paremata (\$4.3m) (new project)
- Complete the safety improvements on State Highway One north of Paremata (\$8.7 m)
- Complete the safety improvements at McKays Crossing (\$12.3 m)
- Implement the Active Traffic Management System at Ngauranga Gorge and three lanes in each direction south to the State Highway One and Two merge (\$5 m)
- Construct the river crossing stage of the Kapiti Local Connecting Road (\$37 m)
- Provide other safety and capacity improvements on State Highway One between Paremata and McKays Crossing appropriate to the timing of Transmission Gully (new project)
- Develop proposals for the future of the existing State Highway with appropriate agencies for once Transmission Gully is built (new project)
- Resolve funding, legislative and resource management issues relating to Transmission Gully, purchase required land and commence construction if possible (new project)

### Public transport

- Upgrade the Paraparaumu Railway Station building (\$0.5 m)
- Build a new railway station at Raumati (\$2 m)
- Extend the urban electric rail service to Waikanae (\$5 m)
- Increase weekday urban rail frequency from the Kapiti Coast to Wellington to 15 minutes in peak period and 30 minutes in the of-peak (annual additional cost of \$1.2 m)
- Provide additional commuter car and cycle parks at major railway stations,
- Seal existing unsealed carparks at stations

- Increase rail feeder bus services to match the increase in urban rail frequency

**Projects outside the corridor**

- Construct the Ngauranga-Aotea tidal flow system (\$16m)
- Construct the bus/rail interchange and associated pedestrian connections at Wellington station (\$8 m)

**Projects beyond 2004 – roading**

- Construct Transmission Gully as a toll road as soon as possible (\$233 m) (new project)
- Construct the remainder of the Kapiti Local Connecting Road (\$24 m)
- Construct the Hutt Valley - Porirua Road Link (\$62 m)

**Projects beyond 2004 – public transport**

- Provide new stations at Lindale, Aotea Lagoon and Glenside as population growth creates sufficient demand (\$4 m)
- Upgrade remaining railway stations on the corridor
- Provide light rail services or alternatives from Plimmerton and Porirua East to Wellington (enhanced bus and rail services being provided until demand warrants light rail) (\$15 m)
- Provide additional rail services to Otaki and beyond.

**Building Transmission Gully early as a toll road will require:**

- Some funding from local sources depending on the level of funding support provided by Transfund New Zealand; and
- Legislation to allow the road to be tolled.

## Appendix D: Summary draft 'corridor protection zone'

(This summary is a draft of the framework proposed for a corridor protection zone).

### **Purpose of zone:**

To provide for the location, spatial needs and protection for the long term, 20 to 50 year, strategic landscape, transportation corridor, public infrastructure and open space needs required for both existing and future urban development systems.

### **Objectives:**

By making early provision and protecting appropriately placed open spaces well before adjacent urban development and subdivision occurs and also many years before the development of the transportation corridor, infrastructure facilities and landscaping the Corridor Protection Zone will assist in securing the enhancement of the built and natural environment of the Region and District.

### **Policies**

To retain and enhance the existing and future planned environmental qualities of the zone until the areas are needed for future landscape, infrastructure and transportation purposes.

To ensure no activities or structures are located or erected that would prejudice the future proposed development or works intended for the zone.

To ensure that any future activities, structures or works in their location, arrangement and development are compatible between the zone and adjoining zones.

To ensure all activities, structures and works undertaken in the zone are developed in such a way that their performance fall within the environmental and other criteria for such works and also support a high quality of design which is consistent with the future.

To provide a fair and straight forward basis for negotiating the purchase of any land at a time convenient to both the council and the landowner so as to facilitate the transfer of the corridor land to the Council.

### **Rules for permitted activities**

To be developed to match the circumstances for ongoing interim activities.

### **Rules for restricted activities**

To be developed to enable a limited range of suitable activities subject to time limits and reviews.

### **Rules for non-complying activities**

All other uses and activities are to be treated as non-complying activities and would also be subject to time limits so as to avoid conflict with the ultimate purposes of the Protection Zone and adjacent zones.

### **Policies for purchase of properties by the planning authority**

The purpose of the zone is to enable the council and the property owners to enter into negotiation so the Council may, at a convenient time to both parties, purchase the property. The property would then be managed in a positive manner prior to the land being transferred to the utility ,transportation or open space reserve agency for its ultimate public purposes.

**Terms of valuation and negotiation**

The Council and the owner will appoint an independent assessor to establish the value of the property which should take into account historic and projected valuation pertinent to the value of the land within the Corridor Protection Zone and also valuations of land abutting the zone.

**Terms of transfer of the land from the council to any other agency**

When the Council transfers the land to another agency for undertaking a work or inclusion in a scheme for infrastructure or landscape improvement this may be subject to conditions, guarantees consistent with the corridor purpose stated in the Regional or District Plan. In the event of the agencies proposed development being abandoned the land shall revert to the Council for integration into the council's planning for the area.

## Appendix E: Selected projects methodology and assessment

### E1 Selection of projects

The general basis of selection of the projects selected for research and assessment in this project is set out in chapter 4, sections 4.3 and 4.4. A list of the projects can be found in chapter 7 (table 7.1). The majority are state highways or major regional routes which have been debated and adopted over the period from 1960 to the present.

What follows is not a peer review of scheme assessment reports nor does it consider the details of traffic volumes, engineering solutions, programmes and funding.

The purpose of this investigation is at a higher level and asks three questions:

- The fundamental framework for planning future development of our communities are the transportation proposals being prepared within an understanding and environment of both future growth and the planning proposals both strategic and RMA related to that community?
- Have the proposals been driven by congestion and traffic demands solely or are they leading regional development in anticipation of a more coherent development plan and community structures integrated with transportation quality and levels of service?
- Are there any fundamental impediments (apart from lack of funding) which have prevented a technical recommendation that would lead to a sustainable transport facility/system in the future?

### E2 Survey of projects and assessments

During 2005 and 2006 all the sites were visited and scheme reports were made available in many cases. In particular a standard survey form was used to bring the diverse situations into suitable groups for description of the proposals and consistent assessments. The standard form for interview and record used comprised six areas over six pages covering:

- A. General description of the corridor
- B. Design factors and planning protection
- C. Selected cross section and protection width
- D. History of corridor inception to the present
- E. For built projects – assessment of effectiveness
- F. For proposed projects – assessments of potential effectiveness

Having obtained the description of the project and the history of its development and present state a series of questions were asked of the engineers and planners involved in the scheme planning, construction and if now in used, comments on its operation. The most important questions for this research were focused on the assessment of effectiveness and as illustrated by the details of Part F – Assessment of potential effectiveness (a copy of the questionnaire for Part F is on the following page).

It was found that this style of structured interview gave more than enough information to enable a clear distinction to be drawn between the relative qualities inherent in each of the projects.

See table E.1 for a summary of the findings.

**Projects survey assessment  
Assessment questionnaire 12.12.05**

**Transport corridors and community structures**

**Region:** \_\_\_\_\_

**Corridor name:** \_\_\_\_\_

**(Research appendix no.)** \_\_\_\_\_

**List of issues**

- A. General description of the corridor
- B. Design factors and planning protection
- C. Selected cross section and protection width
- D. History of corridor inception to the present
- E. For built projects – assessment of effectiveness

**F. For proposed projects – assessment of effectiveness**

F1 Is the route proposed for other urban form objectives and not solely for traffic purposes?

F2 Is the proposed corridor ‘future proof’ and adequate for long-term capacity and future traffic mode needs?

F3 What was the project’s economic assessment benefit-cost?  
What would it have been with property costs had been excluded?

F4 Is the proposed landscaping and open space going to yield a pleasant future environment?  
Will it also add to shaping planned urban form?

F5 Have other:  
– services utilities  
– open spaces  
– residential redevelopment

been included in the corridor planning?

F6 Have the effects on abutting communities:  
– improved accessibility  
– assisted with landscape  
– assisted urban design  
– overcome any severance  
– reduced noise vibration?

F7 Will the corridor contribute to the big picture ‘corridors and rooms’ for planning urban form of the metropolitan region?

[Note the respondents were asked to respond Yes or No. A Yes was then qualifies by a (+) (0) (-)]

## E3 Summary of assessments

The 24 transportation corridors covering the range of major multi-mode major corridors to rural expressways were selected and have been assessed against four key dimensions or criteria.

- 1 The relationship to future regional urban form, growth strategies and suburb
- 2 The relationship between transport corridor landscape and land uses abutting the corridor
- 3 The relationship between multi-modal transport functions and future proofing
- 4 The relationship between regional network links and local networks and the creation of suburbs free from extraneous traffic.

Using these criteria the 24 facilities were then placed in three groups:

- 1 Group A (eight) support sustainability objectives.
- 2 Group B (seven) existing corridors that have potential to meet the sustainability criteria but are flawed and require a programme of enhancement.
- 3 Group C corridors where the potential improvements can never be achieved in three of the cases. In the other four they will require a complete review of present plans to create greatly enhanced schemes.

From 24 proposals of motorway and arterial transport corridors the score board in this investigation results in the following:

Seven corridors fall in the multi-modal category, four in Auckland and three in Wellington.

These are the heaviest trafficked corridors in New Zealand and all nest with road and rail or road and bus lanes. In all cases the rights of way are subject to complete control of access. In the Auckland case good engineering and fine bridging structures are present but even so in many cases the narrow reserve widths will be a limitation to sustainability and addition of special purpose or capacity lanes in the years ahead. In the Wellington waterfront case there is an exciting bringing together of every mode of travel in the Ngauranga to Thorndon corridor. The Western Hutt Road has more problems to deal with in its future enhancement but this can be achieved over time. All these are ranked A or B and have been the flagships of New Zealand experience. Their development and management is a complex and fascinating story.

The Auckland Eastern Motorway corridor proposal (Group B) is a combined mode road rail corridor along most of its length. As a proposal with quite extensive designations, it would appear that the planning could readily be upgraded to match the sustainability criteria. This would mean some widening of the corridor and also the need to purchase some additional properties.

While the whole exercise would be more costly, that is the inherent consequence of a scheme to develop a proposal that passes through such a complex suburban area and must meet the sustainability criteria for integrated environmental, land use and transport sustainability in the future. When it is done it will have to be done very well and it will be more expensive as a result.

There are eight (of the remaining 17 corridors and arterials) ranked in group A. These appear to have the potential prospect of being able to contribute on an ongoing basis to sustainability in transport and the environment in the 30 to 50-year timeframe.

Of those eight, only four have been built (including Te Irirangi Rd 2000, Addington Motorway 1977, Kaiapoi Motorway 1967 and Queen Elizabeth II Drive (1992). The four proposals identified as future quality sustainable projects included here are:



- Hamilton, Ohinewai to Cambridge Expressway
- East Taupo Arterial
- Transmission Gully
- the 1967 Christchurch Northern Rural Motorway.

All these projects are expressways located on the edge of the urban area and each has a wide right of way up to 100m. They are being constructed in the rural area adjacent to newly developing urban areas and a happy marriage of space and insulation from conflicts should be achieved. These corridors appear to be of adequate width to accommodate up to three lanes in each direction and with good open space in and adjacent to the corridor for landscaping and protection from effects, opportunities for nearby cycleways and enabling good separation from adjacent residents mean that sustainability should be readily achieved.

Eight projects are included in Group C. These current scheme assessments have little prospect (using the present scheme plans) of being enhanced to meet the sustainability criteria for transport or integrated in a comprehensive way with their surrounding environment and land-use footprint.

Regrettably many of the balance in Group C are likely to be subject to noise bunds outside the right of ways, ongoing neighbour complaints, and access and safety problems, and will not meet the engineering, landscape, planning, urban design and urban development strategies for the regions involved.

There are three in Group C which includes proposals that were originally planned in the 1960s and designed on a wider horizon to match desirable sustainable, environmental and urban form outcomes. Some have in the post-1990 engineering and planning re-assessments, been down-graded ( eg Christchurch Southern Motorway). This appears to be simply to reduce initial costs to a minimum standard sufficient for a requirement to gain designation consent. The standards of the 'current' scheme assessments place three of these proposals in Group C. These three should not (on their present scheme assessments) really proceed in the face of the objectives included in the LTMA 2003.

The Wellington one way system across Te Aro flat between the tunnels is also included in Group C. There is no way that the at-grade street system can be enhanced to meet the four dimensions of sustainability used in this research. The proposal is really a traffic management network for accommodating traffic circulation and redistribution within the area. It does not introduce new facilities that either enable transportation sustainability and future proofing or meet the potential for redevelopment and an improved environment in this locality. The 2002 scheme did not lift extraneous longer trip traffic from the local network.

Three arterial street examples underline that it is sometimes difficult, and may be impossible, to retrofit an existing arterial road which was built to a lower standard within a minimum right of way, so that it will meet the two criteria of future proofing and environmental sustainability. In this context there are three urban arterial streets which fall in Group C (Greenlane, Blenheim Rd and Esmonde St). It seems likely these urban arterials may have to be accepted as they are and just maintained in the best way possible in the meantime. This means of course, that additional traffic growth along these corridor links, in the absence of major widening, will have to be accommodated on parallel existing network links or through the creation of new links.

Table E.1 Table of projects assessed in this research

PROJECT STATUS	PROJECT DESCRIPTION				ADJACENT PLANNING FUTURE SUSTAINABILITY																			
	Year Years Orig Corridor App Built	Org Later No. No Lns Lane	Width Fut. of Medn GVs	Cycl Land Bus Wvs Areas	ROW Width to Metr	Pot' Width Metr	Acc's Sep'n Contl	House Dist Avg Min	Set Bck Hous	House Now Fut	Fut Removal Cap	Multi Widr Mode	Proof Natl or Reg	Assist Rnk Plan Polic's										
<b>MOTORWAYS URBAN (Rd/Rail)</b>																								
1 AK	Northern Motorway	1958	1959-1997	8km	3+3	4+4	6m	1+1	No	Minor	60-100	Poss	Full	50	10	Poss	Nil	10	Poss	Rd+Bus	SH1	Maj	A	
2 AK	Barry's-Constellation	1955	1977-2000	8km	2+2	3+3	4.5m	Bus	Yes	Minimal	100-16(Little	Full	Full	40	25	V. Diff.	80	20+	No	Rd+Rail	SH20	Mod	B-	
3 AK	Mangere-Richmond	1953	1953-1963	7km	2+2	3+3	8m-0m	Poss	No	Minimal	60+Rly	Little	Full	40	20	V. Diff.	Nil	Nil	No	Rd+Rail	SH1	Maj	B-	
4 AK	Newmarket -Penrose	1967	Proposed	8km	2+2	3+3pt	6m	No	No	Moderate	60-120	Poss	Full	60	40	OK	50	Nil	Poss	Rd+Rail	Reg	Mod	B+	
5 WN	Tamaki Dve- Panmure	1955	1959-1969	4km	3+3	N/A	0	Poss	Yes	Minimal	80-150	Little	Full	40	30	OK	Nil	Nil	No	Rd+Rail	SH1	Maj	A	
6 WN	Tinakore -Ngauranga	940s	1953-1985	18km	2+2	3+3pt	0-8m	No	No	Liberal	50-150	Poss	Full	30	10	Difficult	Nil	Few	Poss	Rd+Rail	SH1	Maj	B+	
7 WN	Ngauranga-Plymington	1950	1960-1990	12km	2+2	3+3pt	0	Poss	No	Minor	40	Little	LAR	20	10	Poor	No	Few	No	N/A	SH2	Mod	B-	
<b>MOTORWAYS URBAN</b>																								
8 CH	Northern Urb/Rur	1966	Proposed	2km	2+2	3+3	14m	Poss	Poss	Liberal	120	Poss	Full	40	60	V. Good	300	Nil	Yes	N/A	Nat	Maj	A	
	St.Albans Urban	1966	Proposed	8km	2+2	3+3pt	20m	Poss	Poss	Liberal	120	Yes	Full	60		V. Good	6	Nil	Yes	N/A	Nat			
9 CH	Waimariri Rural	2002	Proposed	8km	1+1	2+2	0	Poss	No	No	40-60	Poss	Full	40		Zoning	Nil	Nil	Poss	N/A	Nat	Mod	C-	
10 CH	Northern Mwy Rural	1967	1970-77	3 km	2+2	3+3	14m	Poss	Poss	Liberal	120	Yes	Full	40	60	V. Good	80	Nil	Yes	N/A	Nat	Maj	A	
	Winters to Chaney	1967	Proposed	10km	2+2	3+3	20m	Poss	Poss	Liberal	120	Yes	Full	60		V. Good	10	Nil	Yes	N/A	Nat			
	Addington Urban	2002	Proposed	10km	2+2	0	6m	No	Poss	Designth	45m	Yes	Full	15	40	Poor	10	Nil	Poss	N/A	Nat	Maj	C-	
11 CH	Paparua Rural	1960	1967	10km	2=2	3=3	10m	Poss	Poss	Extensive	100-200	Poss	Full	N/A	30	Rur/Urb	Nil	Nil	Yes	N/A	SH1	Maj	A	
12 CH	Kaipoi Northern	1977	Proposed	17km	1½	- 2+2	0	Poss	Yes+Yes	Yes	100	Yes	LAR	N/A	40	Rural	Nil	Nil	Yes	Yes	Nat	Maj	A	
	Chaney to Pinehaven	1989	Proposed	27km	2+2	3+2	3m	Poss	No	Extensive	100-200	Poss	Full	N/A	50	Rural	Nil	Nil	Yes	Yes	Nat	Maj	A	
	Chaneys to Pinehaven	1992	Proposed	21km	2+2	3+3	6m	Poss	No	Yes	100	Poss	Full	N/A	40	Rural	Nil	Nil	Yes	Yes	Nat	Maj	A	
<b>MOTORWAYS RURAL</b>																								
13 TPL	Eastern ByPass	1980	Existing	9km	1+1	2+2	0	Poss	Poss	Minimal	20-40	Poss	LAR	30	15	Rural	Nil	Few	Poss	Yes	SH58	Mod	B-	
	Airport to Wairakei	1967	1987-1992	7km	1+1	2+2	10	N/A	Yes	Moderate	30-40	Poss	LAR	30	12	Ru/Urb	Nil	Nil	Yes	Yes	SH74	Mod	A-	
14 WN	Transmission Gully	1967	Existing	10km	1+1	2+2	4.5	No	Yes	Minimal	30+	Poss	LAR	30	8	Ru/Urb	Nil	Few	Poss	Yes	SH1	Maj	C-	
15 WK	Linden-to Paekakariki	970s	1998-2000	5km	2+2	0	10m	Poss	Yes	Moderate	39	Medif	LAR	20	5	Urban	Nil	Nil	No	Rd+Bus	Reg	Mod	A	
	Hamilton Expressway	950s	Existing	9km	1+1	1+1	0	No	Poss	Nil	20-25	Little	Zoning	0		Urban	Nil	Few	No	No	Reg	Min	C	
	Ohinewai-Cambridge	2000	Existing	0.8km	1+1	2+2	4	No	Yes	Minimal	26-30	Little	Urban	3	1	Poss	Nil	Few	No	Yes	Reg	Mod	C	
<b>RURAL EXPRESSWAYS</b>																								
16 WN	Haywards Road	1967	1985-2005	5Km	1+1	2+2	0	Poss	Yes	Moderate	25-40	Poss	LAR	20	5	Urban	80	Few	No	Poss	SH73	Mod	B-	
17 CH	Queen Elizabeth II Dve	1946	1948&1998	5km	2+2	0	0.2m	No	Yes	Minor	30-40	Nil	Urb	5	5	Urban	Nil	Nil	No	No	SH73	Min	B-	
18 CH	Russley - Johns Road	1955	1979-2010	1.5km	2+2	1 way	0	No	No	Minimal	2 x 20	Nil	Urb	5	0	Urban	20	Few	No	No	Nat	Mod	C	
<b>MAJOR URBAN ARTERIALS</b>																								
19 MK	Te Irirangi Drive																							
20 AK	Manukau to Botany																							
	East West Arterial																							
	St Lukes -Greenlane																							
21 AK	Esmonde Road																							
22 CH	Opawa Expressway																							
23 CH	Blenheim Road																							
24 WN	Wellington Inner City																							

Note: Additional project description, together with maps and photos are included in appendix F.

## Appendix F: Description of 24 projects

This appendix includes a brief description, together with some photos, maps and backgrounds for each of the 24 projects selected to inform this research. It illustrates the history and current practice relevant to the most important parts of the country's transportation system. The projects are reported in the same order as in chapter 7 as follows:

**Table F.1 List of projects assessed in this research**

	Built	Status	Length	Multi-mode
<b>Group I. Motorways urban road and rail</b>				
1. AK northern motorway – Barrys to Constellation	1959-97	SH1	8.0km	Rd+bus
2. AK western motorway	1977-2009	SH20	4.5km	Rd+rail
3. AK southern motorway – Newmarket to Penrose	1953-63	SH1	7.0km	Rd+rail
4. AK eastern motorway – Tamaki Dr to Panmure	Proposed	Reg	8.0km	Rd+rail
5. WN waterfront motorway – Tinakore to Ngauranga	1959-69	SH1	4.0km	Rd+rail
6. WN northern motorway – Ngauranga to Plimmerton	1953-85	SH1	18.0km	Rd+rail
7. WN Western Hutt Rd – Melling to Haywards	1960-90	SH2	12.0km	Rd+rail
<b>Group II. Motorways urban and rural</b>				
8a. CH northern motorway – St Albans to Winters prop	1967	Nat'l	2.0km	Rd
8b. Winters to Chaney's Prop	1966	Nat'l	8.0km	Rd
9. CH northern arterial – Cranford to Chaney's prop	2002	Nat'l	8.0km	Rd
10a. CH southern motorway – Addington Urban	1970-77	Nat'l	3.0km	Rd
10b. Papanui rural prop	1967	Nat'l	10.0km	Rd
11. CH southern motorway – Curletts to Springs	2009-14	Nat'l	10.0km	Rd
12. CH northern motorway – Chaney's to Pinehaven	1962-67	SH1	12.0km	Rd
<b>Group III. Motorway/expressway rural</b>				
13. TP eastern bypass – Airport to Wairakei	2000-11	Nat'l	17.0km	Rd
14. WN Transmission Gully – Linden to Paekakariki	2010-16	Nat'l	27.0km	Rd
15. WK Hamilton expressway – Ohinewai to Cambridge	2007-17	Nat'l	21.0km	Rd
<b>Group IV. Rural expressways/arterials</b>				
16. WN Haywards Road – Porirua to Hutt Valley	Existing	SH5	8.9km	Rd
17. CH Queen Elizabeth Dr – Northcote to Travis	1987-92	SH74	7.0km	Rd
18. CH Russley-Johns – Hornby to Belfast	Existing	SH1	10.0km	Rd
<b>Group V. Major urban arterial (streets)</b>				
19. MK Te Irirangi Dr – Manukau to Botany	1998-2000	Regnl	5.0km	Rd
20. AK East West Art – St Lukes to Greenlane	Existing	Regnl	9.0km	Rd
21. AK Esmonde Road – Motorway to Takapuna	Existing	Regnl	0.8km	Rd
22. CH Opawa expressway – Garlands to Port Hills	1985-2005	SH73	2.0km	Rd
23. CH Blenheim Road – Riccarton to Sockburn	1948 & 98	Regl	5.0km	Rd
24. WN inner city arterial – Te Aro Tunnel to Tunnel	1979 etc	SH1	1.5km	Rd

The particular circumstances of the 24 projects are briefly outlined in the context of their basic characteristics and the road types involved.

## Group I – Urban motorways (multi-modal)

### F.1 Auckland northern motorway from Barry's Bay to Constellation

This length from the new Auckland Harbour Bridge north to Northcote Road was opened in May 1959, with successive lengths being extended up to 1997. The motorway cross section was positioned centrally in the 60m right of way and developed initially as two lane x two carriageways and expanded to become 2x3 lane carriageways as the work progressed. In the mid-1980s serious consideration was given to creating a bus way facility and many alternatives were considered culminating with a scheme assessment report in 2001 to provide for a two-way bus way on the eastern side of the motorway with major bus rapid transit stations. This has involved the restructuring of the eastern berms of the motorway and their extension. At times the parallel bus route has been built in very tightly with quite steep-cut cross sections due to a requirement of having to fit within a minimum right of way involving minimum property purchase.

This project has proceeded successfully and includes the construction of the Akoranga Station and the Desmond Rd Interchange through the succeeding stations up to Constellation Drive.

The right of way for the motorway has been expanded by virtue of the bus way provisions by 10m to 20m only, and in some locations extensive retaining walls have been placed in preference to property purchase. The set-back of houses from the edge of the motorway was originally about 40m, but this has now been reduced generally by 20m from the edge of the bus way. In one or two cases this yard distance from right of way to houses has been reduced to only 3m.

Had the bus way been included in the original corridor, this bus way development would have been simpler with a wider area for the placement of the two-way two-lane bus way and a larger set-back for houses built near the motorway as a result.

As the motorway was built in a similar period to a lot of the development in the area its footprint has been respected. In addition there are several broad acre uses such as golf courses, bush reserves, universities etc lying in the adjacent lands and leading to good development set-backs and an attractive setting for this motorway. In respect of the four dimensions of urban form sustainability used this motorway is ranked B+.

Figure F.1a Auckland northern motorway and busway



Figure F.1b Northern motorway (left) with busway and Akoranga bus station (looking north)



## F.2 Auckland south western motorway (SH20) – Mangere to Richmond.

Originally confirmed in the 1955 Master Transportation Plan, in part this embraces both a rail link and a motorway designation. While the motorway is proceeding as a matter of urgency, the existing protected rail route along SH20 to Avondale (ie the Avondale south-bound line) is to be retained and the timing of the development of this route will be driven by demand. A bus lane solution is being pursued in the short term.

The right-of-way width for the motorway varies between 100m and 140m plus, which would not appear to be adequate for both the road traffic lanes and also the future rail route on the north side.

Overall as a right of way for a joint multi-use motorway and rail system the corridor is very constrained. Certainly the introduction of a rapid transit and freight rail link along this route in the future will require additional property purchase within the designation and may require additional properties at selected locations outside the present designation.

Present plans incorporate a cycleway on the south side of the motorway linking between streets from Hillsborough to Sandringham Road.

The median is minimal with two 2-lane carriageways. It is suggested that with a route of this significance it would have been preferable to have had a wide median so that in the interests of transport sustainability a third lane could be placed in each direction in the future.

Generally household properties are in close proximity to the route as the designation follows through well established areas. There could be zoning provisions in the future to set residential properties back from areas subject to high noise levels, and to ensure there is improved landscape and amenity treatment.

While the concept of this multi-modal corridor and the strategy studies undertaken are to be commended, the proposal still sits within a tight land requirement with little regard for the transport corridor footprint covering the land uses to the north and south.

Overall this project is deemed to rank B- in the urban form future proofing and sustainability categories.

Figure F.2a South western motorway SH20

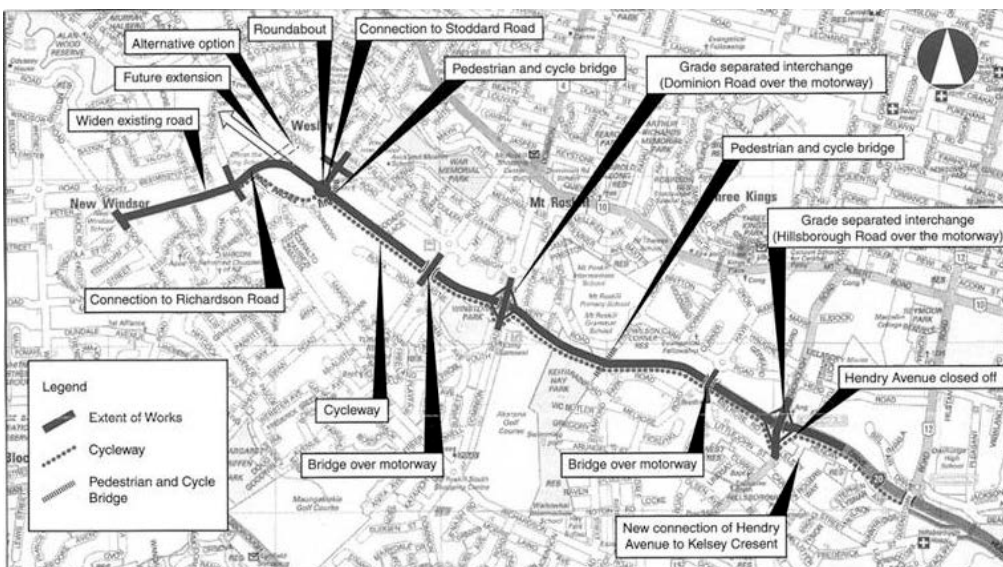


Figure F.2b South western motorway, Mt Roskill

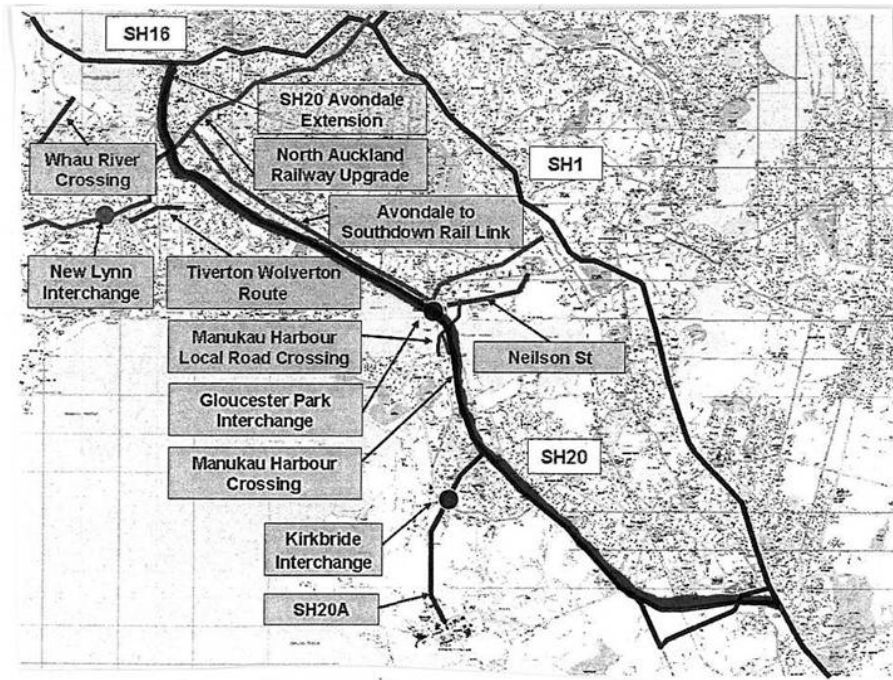


Figure F.2c Auckland western corridor SH20



### F.3 Auckland southern motorway – Newmarket to Penrose

This was the first section of urban motorway built in Auckland, opening in 1953 and successfully extended during the 1960s. The motorway nestles alongside the main trunk railway in its length from Ellerslie to Newmarket Viaduct.

Originally opened as a two-lane dual carriageway with a wide median, traffic pressures have now extended the cross section to three-lane carriageways with a solid concrete wall median.

The nature of the right of way, the form of the construction of the bridges, and the proximity to the railway all indicate that it will not be possible to extend the motorway to a 2x4 lane facility in the future. The Newmarket Viaduct has been widened for both structural reasons and in order to provide four lanes in both directions through this section. This began in 2008/09 following supporting designation processes. There might have been some advantage in including these designations in a wider corridor protection zone.

In addition, the on-ramps in this length are being metered so the traffic management of this established facility is of a high standard. The motorway footprint on a route of this importance extends to the properties on each side of the transport corridor and could well include more consideration of the zoning of the adjacent areas and landscaping in order to improve the sustainability and environmental qualities of the route. However, with this length of transport corridor well established and operating at its maximum it may not be realistic to seek a widened corridor. Supplementary relief might be available through the construction and expansion of both the south western and the eastern motorways so as to provide sufficient total capacity across the isthmus screen line.

Obviously a significant number of buses are in the main traffic stream but in this case there is no opportunity remaining for a separate bus way facility. True it is parallel with the commuter rail route which provides an opportunity for a complementary modal split.

This route falls into rank B- in the urban form sustainability and environmental ranking.



Figure F.3a Map from Newmarket to Mt Wellington

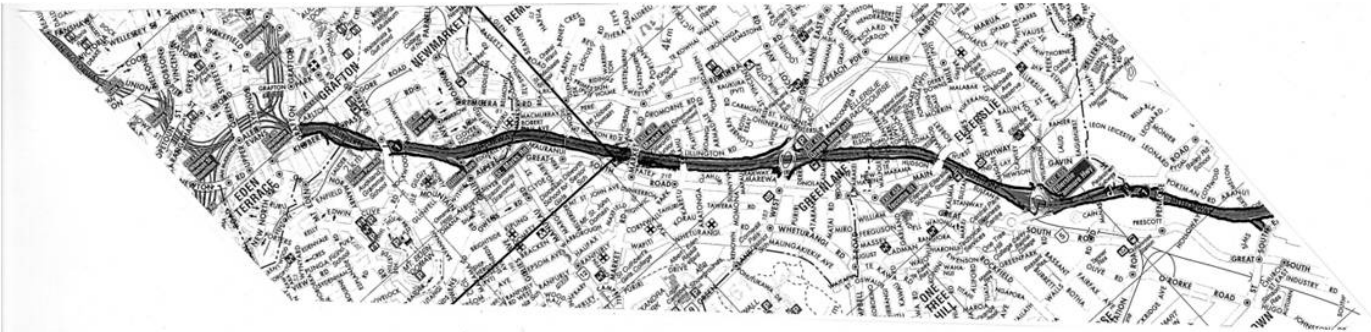


Figure F.3b Photo at Greenlane



## F.4 Auckland eastern motorway – Tamaki Drive to Panmure

Originally proposed in the 1950s and subsequently investigated in detail in 1967, and on several occasions since including 2003, this route is still a proposal. There are designations in place held by the government for future railway use and by Auckland Council for a future motorway. These protect the land as a future transport corridor. The route follows the general line of the Auckland-Westfield railway. Planning for this route has had a checkered career since it was originally authorised by an Order in Council in December 1967. It was proposed as a regional road with agreements between the National Roads Board (NRB) and the Auckland Regional Authority (ARA) in 1968. Detailed investigations of this route were undertaken in the 1950s, 1960s and 1970s and in particular in the 'South eastern motorway report' by Moss, Rankin and Hill (March 1975) for Auckland City Council. More recently in 2001 and 2003 another range of proposals was prepared for the council under the heading of 'The eastern transport corridor'. These included a major report by Opus (March 2004) 'The eastern corridor' which had been preceded by a report by URS (2003) 'Eastdor'.

There is no doubt that this route is feasible and likely to be constructed sometime in the future. In terms of its designated area the right of way varies from 60m to 120m with many additional pieces of land purchased and held by the Auckland City Council and the government for the railways. This proposal can still take advantage of opportunities for establishing a satisfactory footprint and redevelopment of the adjacent land. There is also the advantage of a joined multi-modal corridor and in the modern context the opportunity to develop an easy graded cycleway abutting the transport corridor might be considered.

While the new route might initially be a 2+2 lane facility, the previous plans did provide for a 3+3 route as well as a median of 6m.

A major difficulty for this particular route is the integration of its linkage into the central city network at its northern harbour/city end.

As this is still a proposal and there are extensive areas already designated and purchased the eastern corridor has considerable potential to meet the sustainability and environmental strategies. The area required is well suited to protection through a corridor protection zone. The route can be constructed to cope with immediate traffic demands in stage 1 with potential to provide for increased lanes and bus lanes in the longer term on 3+3 lane configuration. Overall the potential urban form sustainability and environmental ranking of this future project appears to be rank B+.

Figure F.4a Auckland proposed eastern motorway, Hobson Bay

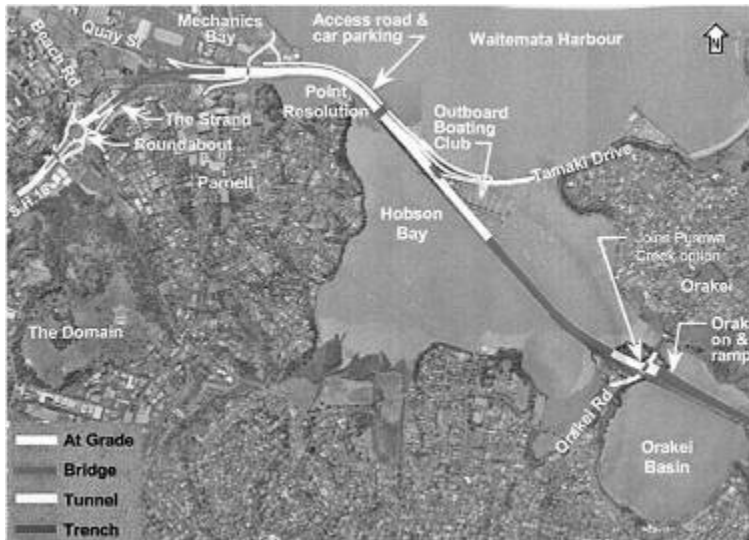
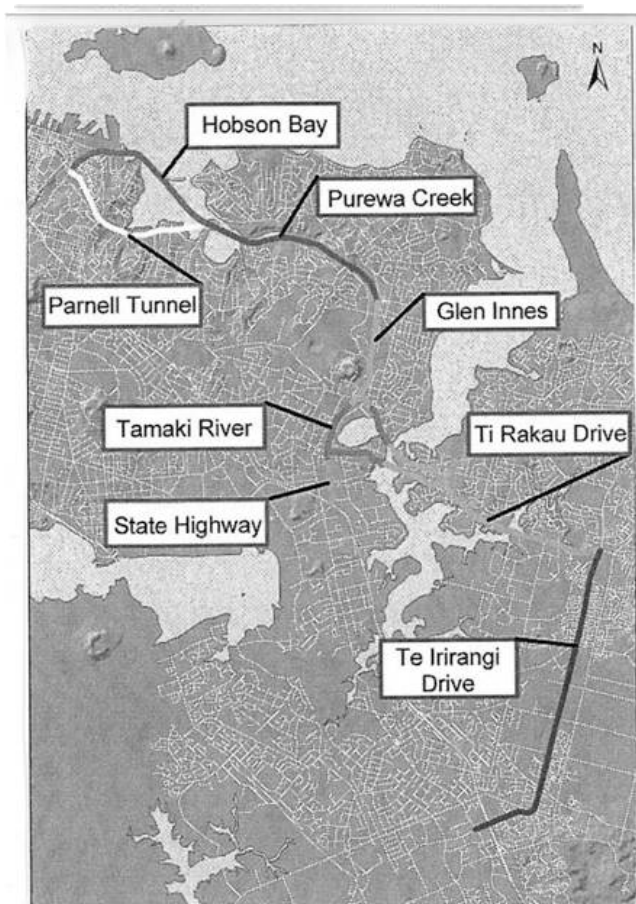


Figure F.4b Auckland proposed eastern motorway localities



## F.5 Wellington waterfront motorway – Tinakori to Ngauranga SH1

This is the most intense and complex transportation corridor in New Zealand. In this 4km length are included rail, motorway, arterial road, cycleways and port activities. The motorway scheme was conceived in the 1950s and construction undertaken between 1959 and 1969. The motorway complemented the Wellington Hutt arterial route with the railway and warehouse and industrial activities occupying land in the corridor below the viaducts and the space between these two major road facilities. At the southern end the motorway enters a cutting travelling below the four or five street crossings through the Thorndon area.

This facility is already at a three-lane carriageway in each direction and includes a number of traffic distribution on/off ramps along the 1.5km stretch on the edge of the central area and approaching the Bolton Street Cemetery and Early Settlers Memorial Park. The first length of motorway was opened in 1959 and extended to the Terrace tunnel in 1969. In the context of sustainability and environmental qualities the motorway is an outstanding success, being placed and occupying the majority of the 250m width of reserve between the Thorndon and Ngauranga escapement and the waterfront.

Obviously this transportation corridor is now and always will be under intense traffic pressure by all modes of travel including rail and road and while it might possibly include bus lanes in the future, the cross section of the combination of modes including road and rail has been developed to near maximum capacity. There is room within the footprint of this corridor for additional land-use control, landscaping and developments of high levels of urban design appropriate to this unique setting. It would be appropriate for some of the edge areas abutting the present travelled way to be included in a corridor protection zone for a variety of traffic, landscape and environmental reasons.

Here the route is included in the urban form sustainability and environmental ranking as a rank A- facility.

Figure F.5a Map of Wellington motorway (looking north)



Figure F.5b Aerial view of Wellington waterfront motorway - Tinakori to Ngauranga



## F.6 Wellington western corridor motorway – Ngauranga to Plimmerton

The development of the western corridor motorway linking Wellington to Tawa and Porirua was agreed in the late 1940s following the relocation of the main trunk railways through the Wellington Glenside tunnel. Taking advantage of the former rail alignment from Johnsonville to Tawa the motorway initially ran from Johnsonville to Porirua and was subsequently extended via the Ngauranga Gorge in the south and through Porirua to Paramata in the north, the latter being completed in 1985.

The development of this western corridor motorway was initially as a dual carriageway with two lanes and it greatly assisted the planning and growth of the western corridor of Tawa, Porirua and Plimmerton. The quality of the alignment and landscaping led to high standards of landscaping and a route of high interest for travellers. The route provides a boundary passing between suburbs and alongside urban locations including Johnsonville and Porirua city centre

The right of way varies considerably between 60m and 150m.

The Ngauranga Gorge section is now developed as a three-lane signalled, speed-controlled section. With additional earthworks and minor changes to the right-of-way boundary, it would be possible to add an additional lane on the sections out through Porirua should this be necessary in the future. In that event a bus and high occupancy vehicle (HOV) lane could be developed. However, the motorway is parallel with a rapid transit and well trafficked heavy rail route which obviously has a large reserve of capacity against future needs. At the northern end the route enters the Paramata urban arterial section which has now been improved to a four-lane urban arterial route. Following hearings and appeal court decisions declining further widening of this section it will remain as a permanent constraint on its traffic capacity. This is however consistent with the urban zoning of the Paramata, Mana, Plimmerton and Pukerua Bay suburban localities. The Wellington Regional Council and Porirua decisions on the possible requirements (appendix D, in main report published separately) set out the reasoning for favouring the proposed Transmission Gully motorway alignment.

Generally, except through parts of Johnsonville and Linden, adjacent housing is set well back from this alignment. In these two locations appropriate zoning provisions could ensure the footprint through these residential and urban environments is managed so as to ensure sustainability and satisfactory environmental treatment in the future.

This facility is ranked B+ as it forms a sustainable style of design now and could be associated with increased capacity especially in the Linden to Ngauranga Gorge length in the future.

Figure F.6a Ngauranga to Porirua route    Figure G.6b Porirua city centre and motorway



## F.7 Western Hutt Road – Melling to Haywards

The incremental improvement of the Western Hutt Road was recommended in the 1950s and through the 1960s and 1980s many improvements were made until the route gained continuity as a 2+2 dual carriageway with local widening to 3+3 at selected intersections. The route is effectively an urban arterial expressway with some lengths subject to limited access road controls. Over the years a number of houses have had to be removed in order to attain the present consistent alignment. Full access control has not yet been achieved and some small groups of houses remain on the western side while on the east there are some houses which are only 10m from the road.

Along the initial Lower Hutt length the alignment is adjacent to the Melling suburban passenger railway; to this extent it is a multi-modal corridor.

While three-laning in each direction could be possible along the full length this would require a major widening on the eastern or Belmont Hill side. In this area there are a series of heavily trafficked intersections serving the hill suburbs. Generally on the eastern side the bridges across the Hutt River provide for major accesses to this essentially urban expressway.

In its present form the route falls in rank C+. There continues to be land-use conflict within the footprint. However additional widening to achieve 3+3 lanes, additional control of access and grade separations, and long-term re-zoning of adjacent land use would indicate that with active ongoing enhancement, widening and the removal of some properties a higher ranking would, with difficulty, be achievable.





## Group II – Urban motorways (road mode only)

### F.8 Christchurch northern motorway St Albans – QE II Drive

This proposal was put forward in the 1960s in order to provide a northern outlet from Christchurch, which would also feed more traffic into the city centre. The original route in the urban area was subsequently abandoned in 1992. The route was expected to commence from the one-way pair of Madras and Barbadoes Streets north of Bealey Avenue. It would begin with a relatively short length of urban motorway only 2km long through the St Albans suburb before entering the rural area with the motorway lying to the east of Northcote and Belfast.

To meet the requirements of open space, an ample median and a good horizontal separation between residences and the motorway was proposed with dual three-lane carriageways and a median of 14m. A 40m distance from the carriageways to the face of adjacent residences would reduce the decibel noise values significantly to below 55dba. A footprint width between houses of 120m was recommended. To achieve these standards and provide for a 'park way' setting which did not impinge on the residential qualities adjacent involved the removal of 366 houses. At a later stage the NRB (and subsequently Transit NZ) reduced the side width and this resulted in reducing the number of houses to be removed to 260. By 1991 when the designations were abandoned, the NRB/Transit NZ had purchased some 200 of these houses. The government's decision, followed by the abandonment of the proposal by the Christchurch City Council, was made in 1991 without reference to previous reports, debates or relevant planning documents, and contrary to the provisions of the approved regional planning scheme.

At the time the scheme planning was nearing completion and most of the designated property purchase had been completed. This was a classic example of politics at national and local level abandoning a well conceived proposal for purely political reasons and without consideration of the consequences, eg a loss of 20% in future business for the CBD and the abandonment of a public transport bus way route. It was a case of 'so near and yet so far'.

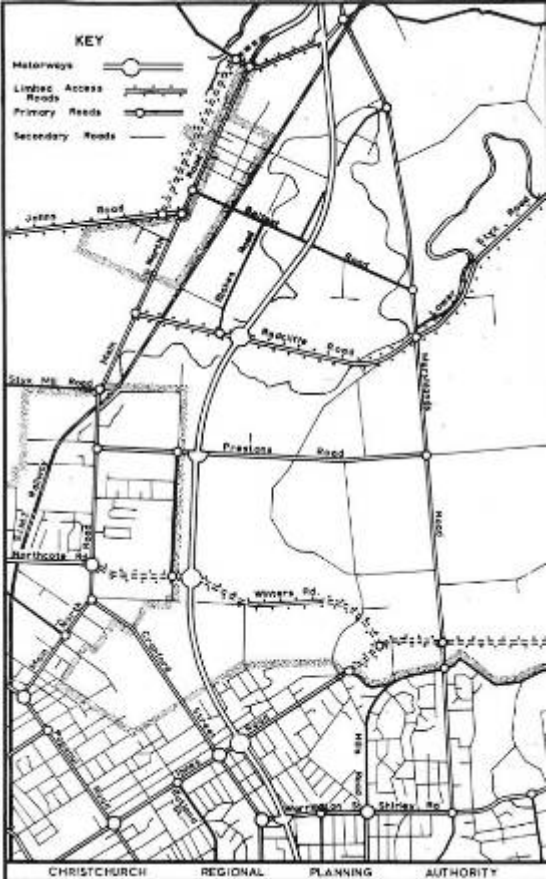
It is not now proposed to reinstate this designation or to have a motorway leaving the city centre north of Bealey Avenue. The abandonment of the St Albans section of the northern motorway has reduced the attractiveness and activities in the city centre for an extended catchment running through the northern city including Papanui, Northcote, Belfast and into North Canterbury. As a result significant retail supermarkets and other developments have taken place at Belfast, Papanui and Riccarton representing a permanent weakening of the city centre. It has also resulted in no less than four radial streets through these northern suburbs being subjected to congestion and extraneous through traffic that should by now have been able to transfer to the motorway.

It should be noted that the route evaporated in 1991/1992 when it was first transferred by Transit NZ to the Christchurch City Council, which in turn resolved not to proceed with the northern arterial. These were political decisions made at both central and local government level without reference to technical engineering or planning evidence, or the regional or district plans, which were relying on the motorway to resolve the northern Christchurch transport problems.

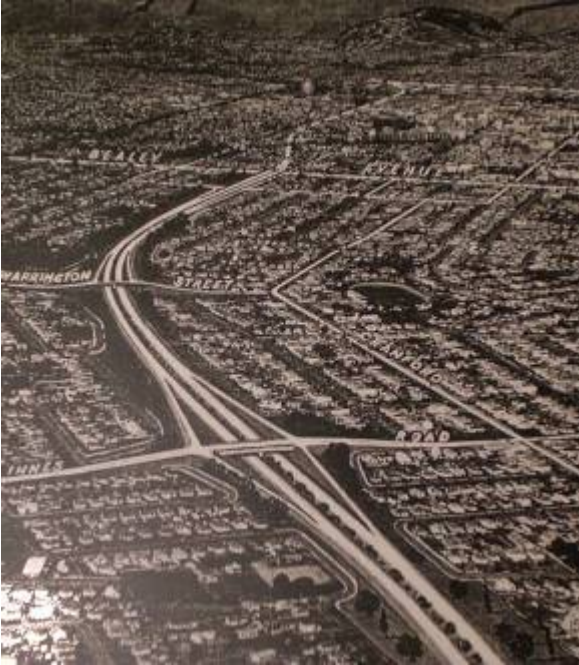
No alternative solution has emerged in the past 17 years. One possibility would have been to have lifted the designation and introduced a corridor protection zone so securing the long-term strategic intention while still enabling residents to continue their daily business and house renovations subject to an ultimate purchase by the council.

Had the proposal proceeded it would have been ranked A of the urban form sustainability and environmental ranking.

**Figure F.8a** Map of Christchurch northern motorway proposed 1967



**Figure F.8b** Aerial perspective of proposed St Albans motorway



## F.9 Christchurch northern arterial – Waimariri rural section (2002)

This proposal also had its origins in the 1960s originally including 8km of rural motorway generally from St Albans through Chaney's to the Waimakariri Bridge. The original design standards were basically the same with a 2+2 dual carriageway capable of being extended to 3+3 in due course and full control of access with grade separation on all major road crossings. The engineering standards were high and planning assessments were excellent. Few houses were involved and those abutting were to be no closer than 40m from the carriageway. Where the route abuts the urban area a buffer zone incorporating the 40m was originally included in the district plan.

The original designation of 100m made in 1971 still stands and the sustainability and environmental ranking would be rank A. Unfortunately the delay in the construction of the route has meant that the widening of the existing Main North Road from 20m to 30m has now taken place including the duplication of the Styx rail bridge; in addition a western bypass of Belfast is now committed. This could have been avoided had the motorway been constructed in the intervening 40 years.

However many reviews have been undertaken and the most recent (called NROS) was for an arterial style two-lane rural route with six at-grade roundabouts covering all intersections. Its continuity towards Christchurch would be provided by the widening of the existing Cranford Street. While limited access would be achieved along the frontage to the route the several roundabouts would obviously lead to a speed-restricted 80km road.

It might be possible for the road to be widened and improved in the future provided the designation for the additional land requirements for the parallel two-lane carriageway was retained and provision made for grade separation at the key crossroads. On that basis the sustainability ranking of this proposal as a rural expressway could have potential for future capacity and layout standards placing it in rank B. This is an opportunity lost.

Although this is the SH1 western bypass and major arterial, in its present 2002 form it is no longer of a major corridor standard and the proposal is ranked C in terms of urban form sustainability and future proofing.

Note: Following the 2010/11 earthquakes, additional urban developments in Belfast, Redwood and Prestons Road areas may well justify such a local arterial network but it is no longer a major motorway corridor leading to the city centre.

Figure F.9a Christchurch northern motorway (rural section - Waimariri proposed 1966)



Figure F.9b Christchurch northern arterials proposed 2002



## F.10 Christchurch southern motorway (1967 scheme plans)

### **Addington urban**

The section was recommended in 1967 and constructed as a two-lane two-way carriageway with grade separation between 1970 and 1977. Its standard of alignment and grade separation with full control of access led to a sustainable engineering solution even at this first stage. Some 80 houses were removed in order to undertake the project but generally the remaining houses are between 40m and 60m from the carriageway edge.

The urban right-of-way width is generally 100m to 120m leaving potential space for the future second carriageway to be constructed and for additional widening to a 3x3 motorway in due course within the existing designation. Because the land was set aside for later expansion this section is now being constructed as a 2x2 motorway as the next stage of development of the southern route. Unfortunately in this current development the median has been narrowed, thus preventing HOV or bus way lanes being added later.

This facility, the only piece of urban motorway built in Christchurch in 50 years was originally ranked A in terms of being placed within an adequate right of way with opportunities for future proofing, and on urban sustainability and environmental grounds. The current (2010) construction past Wigram must be ranked B-.

### **Paparua rural**

This is the 10km length passing south of the former Wigram Airfield and then swinging generally west and north to link with the existing state highway beyond Templeton. The proposal was confirmed in 1967 and a designation of generally 120m was included in both the Halswell and Paparua district plans at that time. The 2x2 dual carriageways were planned to be extended to 3x3 in due course. At that time no consideration was given to cycleways, light rail or bus ways but these could have been included within the designation provided.

The proposal in that original form met all of the sustainability and environmental requirements to bring it into rank A.

Figure F.10a Christchurch southern motorway

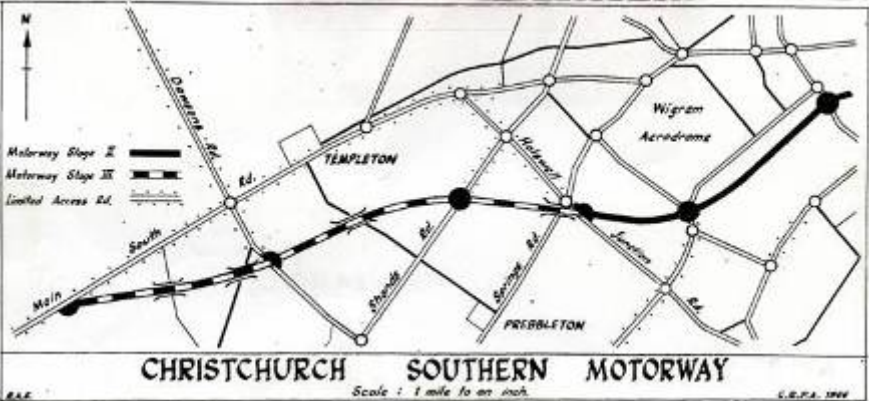


Figure F.10b Christchurch southern motorway – Addington stage 1 (looking east)



Note: wide corridor on south side for second dual carriageway

Figure F.10c Aerial view of Christchurch southern motorway – Barrington Street stage 1 connection (looking west)



## F.11 Christchurch southern motorway 2002

This is the same 10km length referred to in the section on Paparua rural (see section F.10). The current proposal is for a 2x2 lane with a narrow median of 3m and no opportunity to add a further lane to make it 3x3 in the long term. The designation in some lengths has been reduced to 45m although the centre line generally follows that originally designated in 1967. The earlier designation was located appropriately and was suited to long-term functions.

It is noteworthy that Transit NZ and its consultants believed the designation at 45m was adequate. Furthermore there has been no provision for six-lane future proofing of the route, which would seem essential on this major transport corridor. The set-back of houses varies and along much of its length there will be new zoning at Wigram and Awatea where yard requirements outside the Transit NZ right of way have been proposed at 40m and 50m. Few houses had to be removed for the initial construction and none are proposed beyond that. The route is extraordinarily important to the further development of west Christchurch and a logical connection for heavy vehicles between Christchurch, Lyttelton, the rest of Canterbury and the South Island.

Regrettably the current lean, mean cross section of 2x2 lanes lacks provision for a third lane and there is no width for bus ways. Furthermore the bunding for landscape treatment, and the wooden noise walls confine the width of the right of way and preclude later widening to 3x3 lanes.

As the scheme plans have only just left the scheme planning stage and the motorway is parallel with the Christchurch City Council's Halswell area, ie South West Area Plan land-use planning studies, the two could readily have been integrated and reviewed by Transit NZ to bring all four dimensions to a high standard and give the project a rank A before work commenced.

This review confirms the 1967 alignment so there has been ample opportunity to protect the corridor and integrate adjacent subdivision and development. At the same time, sufficient space should have been set aside for future HOV or bus lanes.

This current (2002 - 2005) requirement which, as a new proposal, is minimal and unsustainable in future proofing and environmental terms, places it as rank C.



Figure F.11a Christchurch southern motorway - Addington to Hornby to stage 2

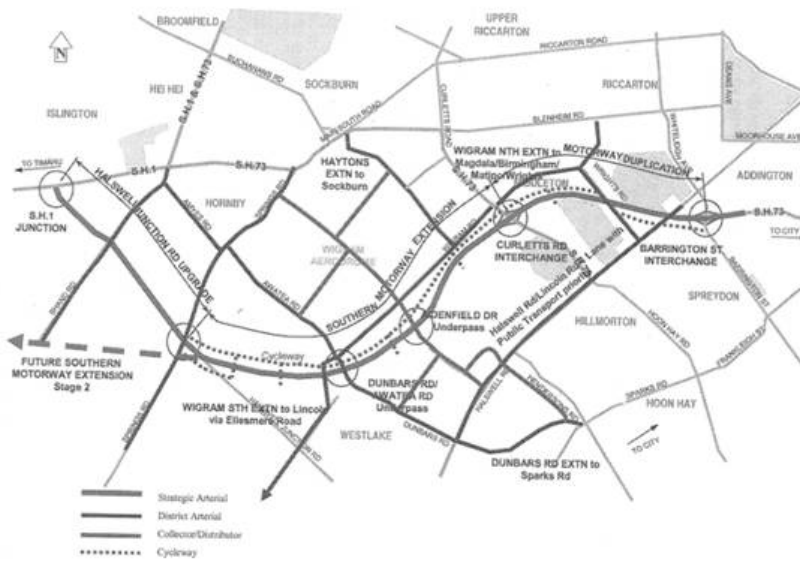
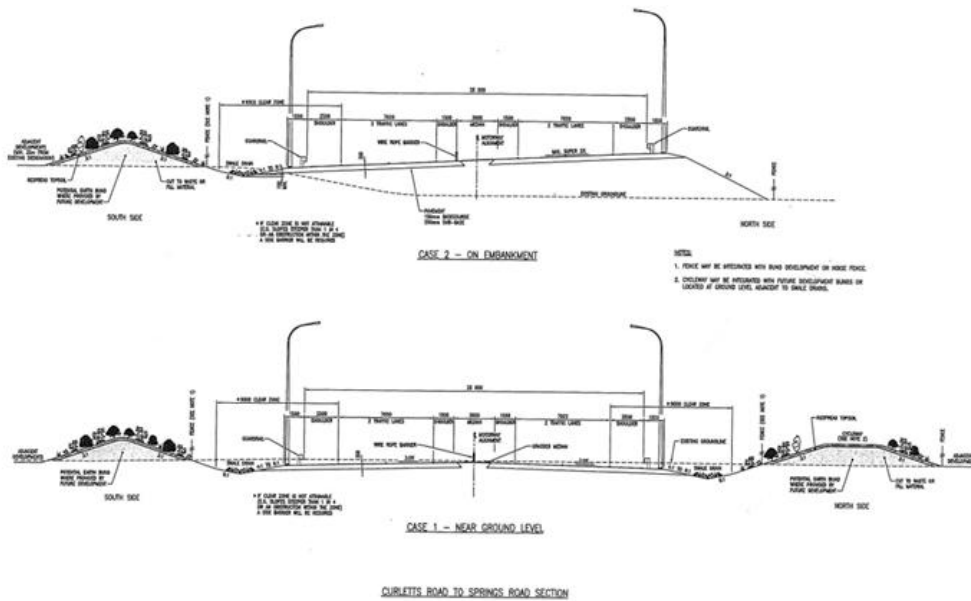


Figure F.11b Southern motorway cross sections



## F.12 Christchurch northern motorway – Kaiapoi section

This 10km rural motorway was proposed in 1958 and after considerable public discussion speedily went on to construction in 1962 and was completed in 1969. The driving force was to provide a logical arterial route for the state highway north and south of the newly constructed Waimakariri Bridge. 2012 is the 50th anniversary of this section of motorway which has served the North Canterbury community and national state highway needs very well. It was the first and only continuous piece of motorway built in the Christchurch region and apart from the Addington section stage 1, no other motorway has been constructed in the Christchurch metropolitan area over the past 50 years.

Initially a 2x2 dual carriageway was constructed with a 12m median. It was constructed so that a 3x3 motorway could be developed with additional lanes taken from the median if required. While no cycleways were provided at that time these could be included in the abutting areas if required. The right-of-way width varies from 60m to 100m and the quality of construction is at full motorway standard with full control of access and grade separation.

Some existing houses in west Kaiapoi are located within 20m of the carriageway. However the new areas of housing in south-east Kaiapoi are set well back and include additional reserve areas and rear yards and generally the 40m minimum set-back applies. In this case the motorway corridor is of an ample width and for over 45 years the National Roads Board, then Transit NZ and now the NZTA have maintained strict control of access along its full length. The quality of the facilities and standard of engineering for 50 years has been excellent with the least amount of disruption to vehicles using the facility.

This is an excellent piece of design, and its layout and integration between road and abutting development and sustainability places it in rank A.

Figure F.12a Christchurch northern motorway, Kaiapoi

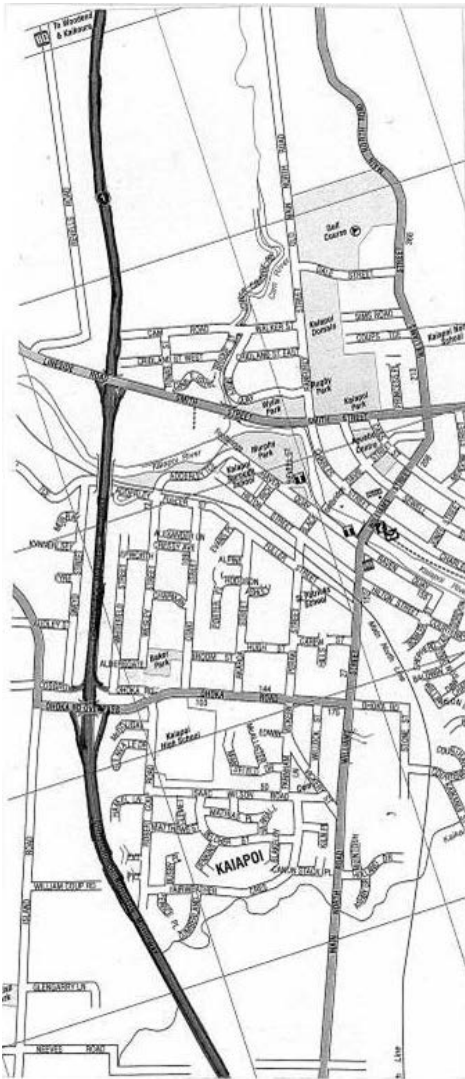


Figure F.12b Kaiapoi motorway and suburbs



## Group III – Major rural motorways

### F.13 East Taupo arterial

Originally conceived in 1977 and, following lengthy appeals, included in the Taupo District Plan at that time, the Taupo eastern bypass was designed to provide an eastern boundary to the urban development of Taupo. It was originally going to wrap around the north of Taupo and provide a link across to urban areas on the Acacia Bay side as part of an edge of urban distributor. However, it is now part of SH1 with an alignment extending from the airport south of Taupo along the original route to Centennial Drive and then turning north directly to SH1 at the Wairakei intersection of SH1 and SH5. The route scheme planning began in 1979 and it was opened for use in 2011.

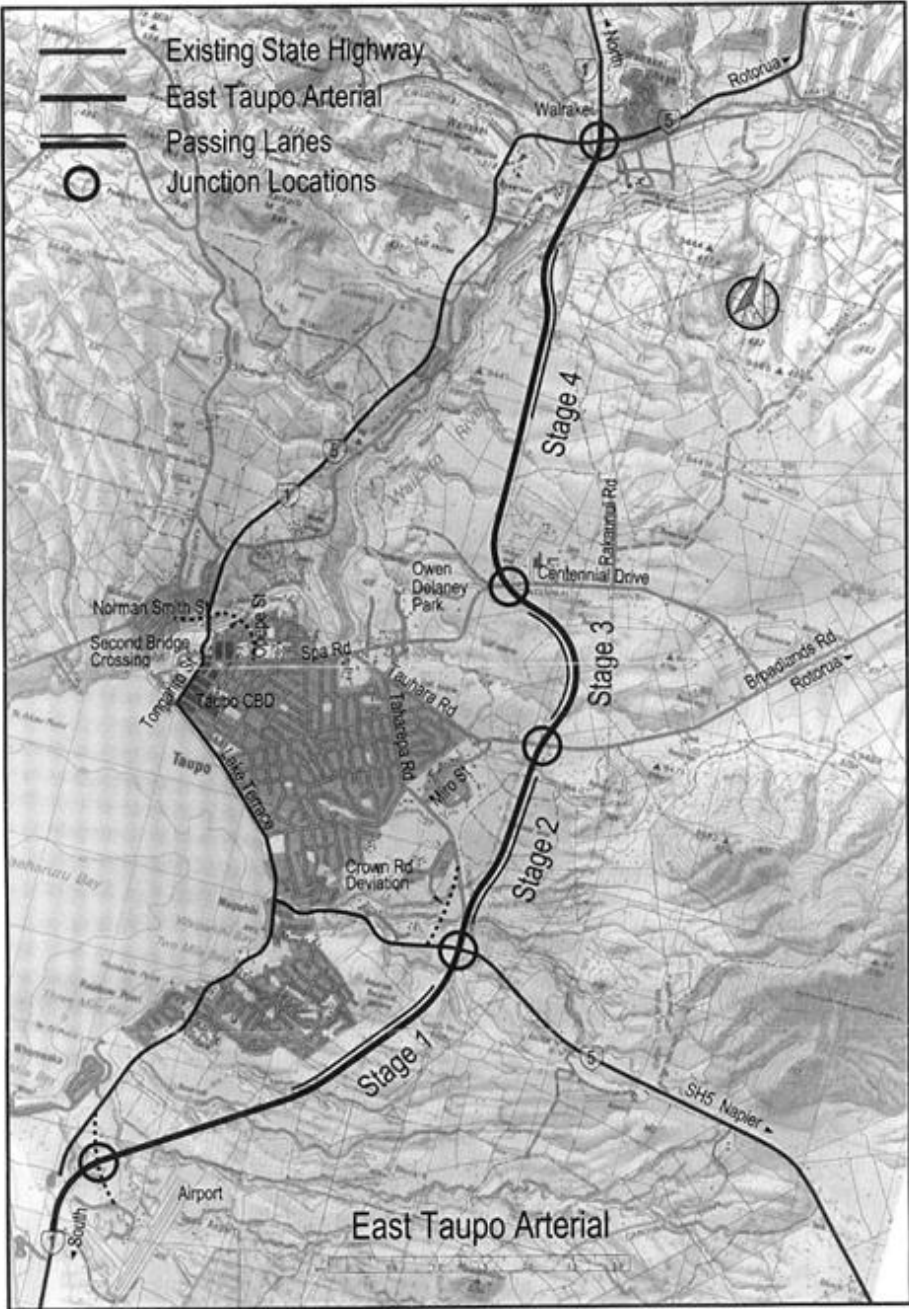
Four stages were proposed and in each stage a two lane plus a climbing lane was the immediate objective. The route is in a 100m right of way, which has been protected by the Taupo District Council in its district plan and much of the land is now owned by the Council. Transit NZ (and then the NZTA) took the central third of this right of way for the construction of the first four stages in this development. It will be possible, of course, to construct a parallel carriageway at a later date and thereby make it 2x2 and in some parts, a 3x3 expressway in due course.

Having been in the district plan since 1977, there were very few conflicts with subdivision or housing development, and the capacity to widen the carriageways and introduce other modal facilities has been retained. The Taupo District Council proposes to use the balance of the right of way for cycleways and equestrian routes.

The original concept also included a higher level ring route planned to serve as an edge route linking around the northern suburbs. The present route's alignment conveniently meets the needs of linking with the SH1 to the north and south and also both as a collector distributor and a bypass for Taupo's main urban area.

This proposal clearly demonstrates the desirability of very early designation and a willingness on the part of the local authority to take responsibility for the purchase of the land and work collaboratively with the NZTA on developing this strategic facility. The Taupo eastern arterial falls within rank A of the sustainability, future proofing, urban development and environmental criteria.

Figure F.13 East Taupo arterial



## F.14 Wellington Transmission Gully

This 27km route from Linden to Paekakariki has been proposed for many years. In 1989 a firm proposal and an environmental impact report was prepared by the Wellington Regional Council and this received approval from the audit of the Commissioner for the Environment. Ever since that time, however, progress has been checkered and the decision on this matter in March 2006 by the Wellington Regional Council Hearing Sub-committee confirmed the wisdom of retaining Transmission Gully as the next major improvement to the northern outlet from Wellington (see appendix C in main report published separately).

The proposal is to be developed in stages initially for a 2x2 dual carriageway but it will be possible later to add an additional climbing lane on both of the major inclines. The right-of-way width for the designation varies from 100m to 200m in this steep terrain. Generally, even in the length on the hillside east of Canon's Creek no house is placed within 50m of the proposed carriageway. However there are some houses at the Linden interchange which are quite close to the proposed ramps where they merge with the existing motorway.

The WRC Sub-committee's report, see appendix C of the main report, is a major planning decision that has deliberately interpreted the LTMA issues of sustainability and environment.

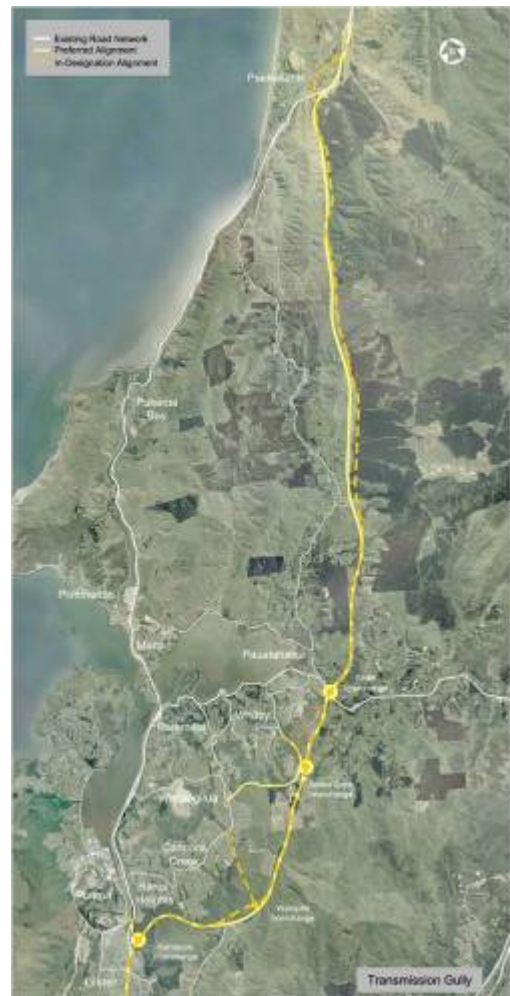
The proposal was the subject of a very intensive hearing before the Environmental Protection Agency in February - March 2011. The environment and geotechnical issues were traversed in great detail.

This proposal is placed in rank A of the sustainability, future proofing urban form and environment ranking.

**Figure F.14a** Transmission Gully route looking north and rising from Pauatahanui inlet to Wainui Saddle



**Figure F.14b** Wellington Transmission Gully, route Linden to Paekakariki



## F.15 Hamilton Expressway Ohinewai to Cambridge 21 km

Early investigations of this route were undertaken in the 1970s and again in the late 1980s. The proposal was adopted in 1992. Designations were in hand for the northern section between 1995 and 1999 and this has now been extended southward toward Cambridge.

This is an excellent example of a rural expressway established to ultimately provide a bypass for Huntly, Hamilton and Cambridge and continuity at motorway/expressway standard for the SH1. Most of the length involves new construction in a rural environment but at Tamahere it takes advantage of the existing SH1 for a length of 8km. This section will be widened to provide 3x3 lanes and includes three major intersections with grade separation.

While this route is a 'broad fields' rural proposal, relatively under-restrained by existing urban settlement, it has been chosen in part to provide a natural urban boundary on the north-east side of Hamilton passing through the former Ruakura research centre area.

The standards of design and the placing of the motorway to bypass the three main centres, together with the provision of a route generally parallel to the existing state highway enabling segregation of through and local traffic, all point to a very successful proposal when it is completed.

The scale of the proposal, however, will mean that it takes many years to accomplish and this is a risk factor on such a long-term project. However the early establishment of the alignment is a good example of forward planning now, for a successful facility in 30 to 50 years time. If held to firmly the adjacent land uses and transportation facilities can proceed with their business in the meantime and in the confidence of this long-term network improvement. This is an ideal location for proposing a corridor protection zone to protect the route, with a wide area required for future proofing and control of the footprint in the meantime and prior to the requirement for designation and construction.

This is a single mode facility and unlikely to be required to accommodate other modes. However a 200m wide corridor protection zone would initially enable protection for a more detailed design designation with a right-of-way designation of 100m at an appropriate time in the future. This would provide future proofing to enable truck/bus lanes and the associated earthworks amenity and landscape areas in the future.

The location of the expressway separates the Hamilton-bound traffic at Lake Road with a proposed Horotiu/Te Rapa bypass and a Hamilton link is also proposed at Tamahere in the south. This route on the east of Hamilton has now become an agreed strategic urban/rural boundary for Hamilton's urban growth.

This Hamilton and Waikato expressway route falls into rank A for sustainability, future proofing, transport design, urban form and environment.



Figure F.15a Waikato expressway, Mercer to Cambridge

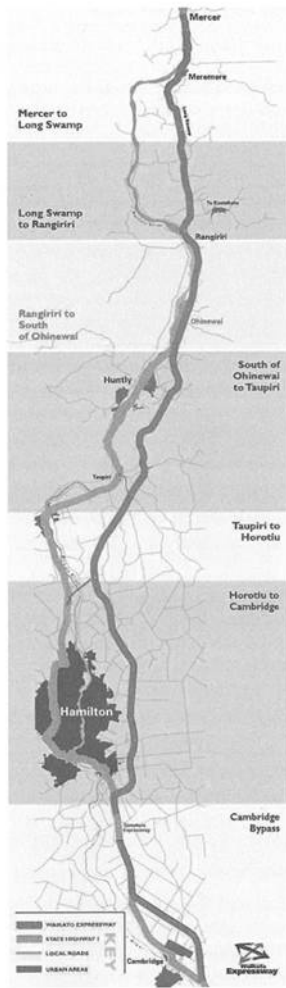
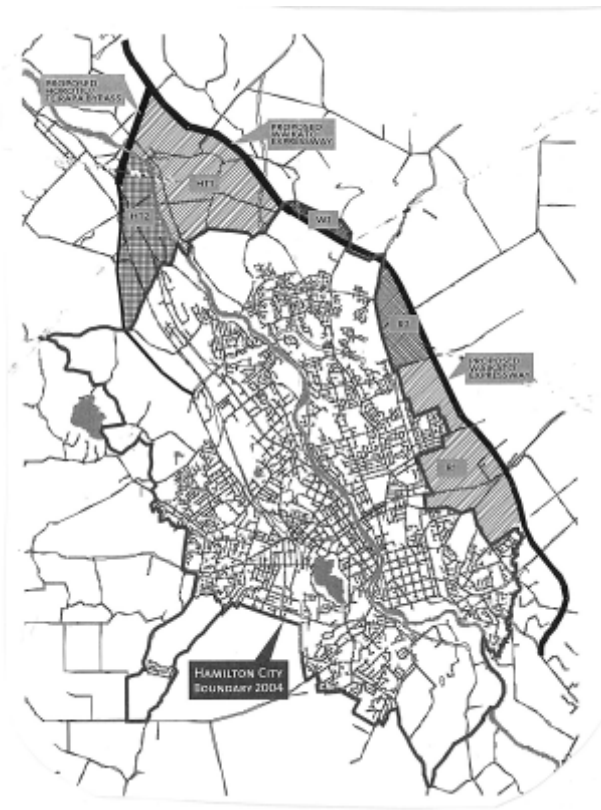


Figure F.15b Waikato expressway and Hamilton urban area



## Group IV – Rural arterials enhanced to expressways

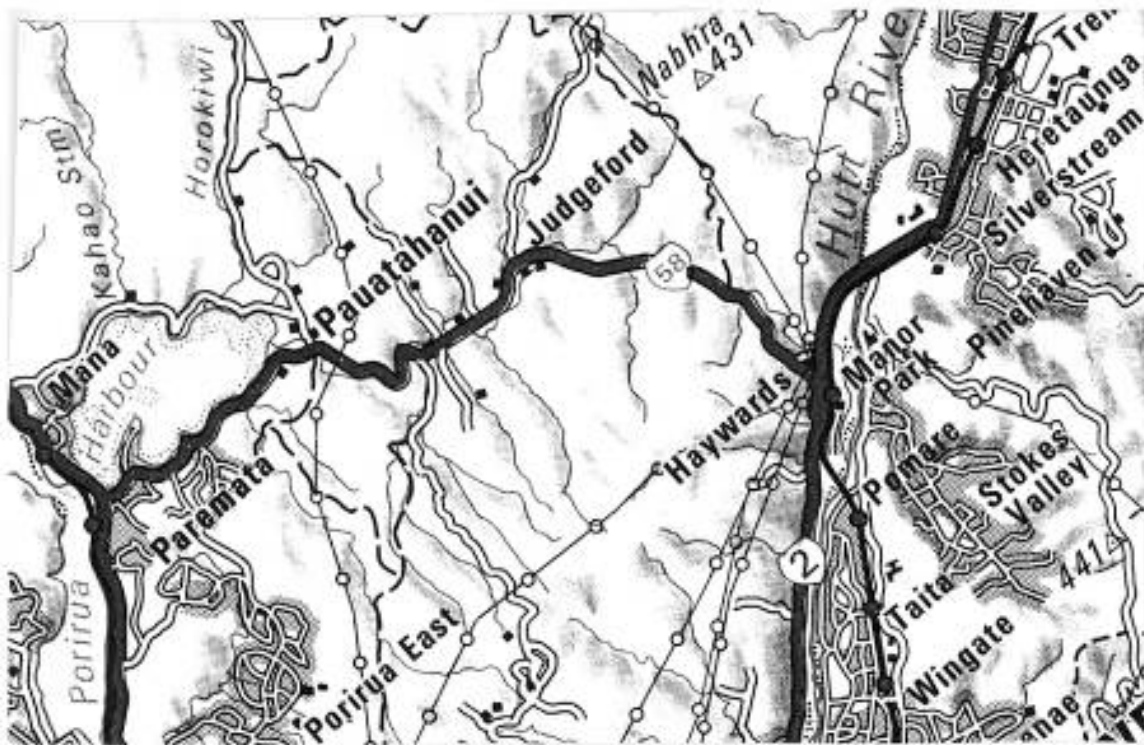
### F.16 Haywards Road, Pauahatanui to Manor Park 9km

This length of SH58 has been identified for many years as the most appropriate link across the wish bone from Hutt Valley to Porirua. It was confirmed as a state highway in the 1980s and at present it is merely a two-lane rural highway. Plans have been prepared for its extension to a 2x2 dual carriageway but they fall within a minimal road widening pattern, increasing the present 20m right of way to 40m in some places. It is a limited access road but this has not been carefully managed with some well established farm houses and several rural/residential properties having been subdivided along its frontage in the past 15 years.

Subdivision housing and accesses appear to be very frequent for the only route, between Porirua and the Hutt Valley, that has a reasonable grade and the opportunity to widen ultimately to a 2x2 carriageway plus climbing lanes. It would seem a firm strategy and road development policy is essential. The route has the potential to be managed in a way that could meet future transportation sustainability and environmental standards. However at this stage we have not seen any scheme that might meet the sustainability standards, and major improvements may be difficult to achieve.

It is therefore included here in rank C.

Figure F.16 SH58 Haywards Road to Pauatahanui



## F.17 Christchurch Queen Elizabeth II Drive, from Northcote to New Brighton

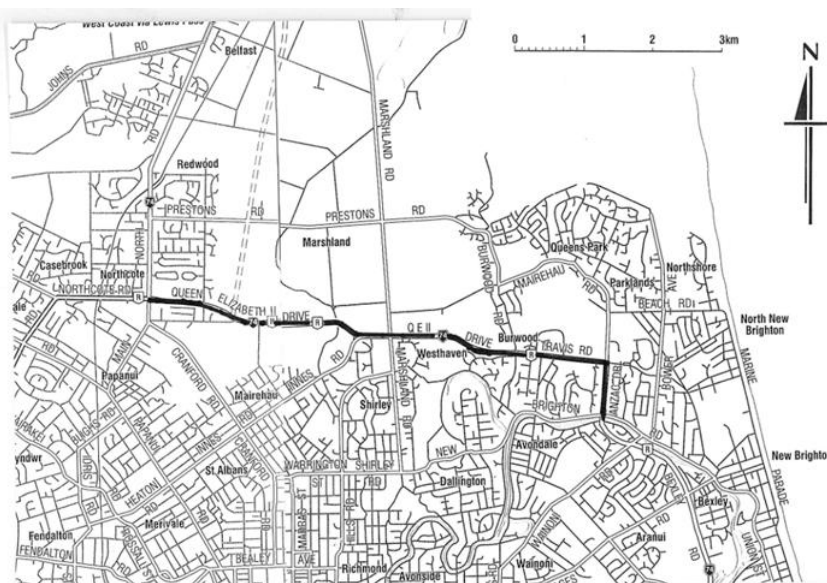
This 7km route was originally protected in 1968 and it was designated as a limited access road from the outset. It is a combination of existing rural and urban roads and new links across Marshlands. The continuity of the route was achieved in the mid-1990s. The 7km route falls generally within a 30m to 40m right-of-way width and was designed as a 2x2 divided carriageway. There is potential for further widening on its northern side zoning which is generally zoned rural over most of its length. In keeping with many other Christchurch lengths of the state highway system the route was developed by the Christchurch City Council and handed to Transit NZ (now NZTA) for its future maintenance and upgrading as SH74.

The route has excellent attributes from a sustainability point of view largely brought about by the choice of an adequate right of way and development as a limited access road. The route achieves its purposes of providing a cross city expressway linking the north west to the north east of the city with a limited access route. It connects from the Main North Road at Northcote and traverses across to Queen Elizabeth Park and then continues via Anzac Avenue as a ring road arterial to the Port of Lyttelton via the Tunnel Road. For future proofing a right of way of 45m to 50m would be desirable.

This route was developed initially as a two-lane road with a second dual carriageway in some sections. Its planning included limited access, provision of separate cycle paths and the opportunity for 2x2 divided carriageways along its full length in the future. Adjacent subdivision has been provided with internal access and earth bunding for noise attenuation with landscape planting provided on the rear yards of abutting properties. There are no separate HOV or trucking lanes although that possibility together with overtaking lanes is envisaged. Major intersections are controlled through large roundabouts. No grade separations exist at present but this is possible in the future especially where the northern arterial crosses on its way to Cranford Street. Along much of its length this route has in the past represented the northern edge of residential and urban development.

This route is a good example of incremental development of a sub-regional major rural arterial on the northern edge of the urban area, ie as an edge corridor reinforcing land-use changes. Its right of way can still be widened for future multi-lane expansion. In terms of transport and environmental sustainability this expressway ranks A-

Figure F.17a Christchurch, Queen Elizabeth II Drive



**Figure F.17b Eastern section of Queen Elizabeth II and Anzac Drive**



**Figure F.17c Queen Elizabeth II and Anzac Drive Bridge and roundabout**



## F.18 Christchurch Russley – Johns Road, Russley to Belfast

Originally conceived in 1967 as an expressway route passing between the urban area and the airport this 14.5km length has had a checkered career. The right of way was protected in 1968 as a 40m width, with all the widening placed at 20m on the western side (Paparua District) so as to enable independent alignment of two rural two-lane carriageways within a 40m road reserve. The road was a boundary road between Waimairi and Paparua Councils.

For reasons of expediency and to avoid battles with Transit NZ in the urban area in the 1990s as part of state highway re-classifications, this edge route rather unexpectedly became SH1 throughout its full length under Transit NZ management and the limited access road status was confirmed. However the widening lines for a 40m right of way have not been retained consistently.

This Russley/Johns route is the last remaining opportunity, on the west of the Christchurch urban area, to construct a high standard expressway route providing for both north/south through traffic and traffic re-distribution to the airport and west Christchurch. It is already carrying 20,000 vehicles per day in some lengths (and higher volumes since the 2010/11 earthquakes).

The route is integral to the urban development strategy now and into the future. Its planning requires complete control of access and ultimately several grade separations at key intersections such as Memorial Avenue/Russley Road, Yaldhurst/Russley Roads and Harewood/Johns Roads. This is a case of converting an old country road into an expressway and the project is enormous and disruptive.

The history of the changing policies on the width and improvements of the route and why the widening was reduced to 30m, on the basis of 5m each side of the old road reserve is obscure. This change of policy has resulted in the road having a variety of designated widths, some 30m, others 40m. The current four-lane proposal is at an urban arterial standard using the variety of road reserve widths available and including a cycle path on the western side which will require additional land to be designated. The minimum width for a suitable route on this alignment would be 40m to 50m with widening for three and four-lane approaches at key intersections. In the longer term it will be necessary to upgrade it to expressway standard with prohibition of individual property access and greatly improved grade separation at intersections. These needs have been exacerbated following the 2010/2011 earthquakes and a higher standard of layout is now urgent.

With the pattern of rural residential development in Waimakariri and Selwyn Districts together with the airport and dispersed industrial and bulk store land uses along this route the future outlook is urgent and grim indeed. This route is going to be under intense pressure in the future and traffic volumes will certainly double within 10 to 15 years.

There are a range of land uses such as the airport, golf course, Avonhead Park and The Groynes abutting the road which improve the landscape and amenity of the route and add to the effective environmental footprint. This expressway should be seen as the spine of an open space corridor, ie a 'between road' reinforcing the separation of the airport and urban development activities.

If the four-laning proceeds as presently proposed (without longer-term motorway/expressway planning and land designation/purchase) it will be another opportunity missed to provide a sustainable expressway route to the west of Christchurch. This route is a candidate for the introduction of a corridor protection zone to provide longer-term security for additional enhancement in the future.

When this report was prepared the proposal was a 2005 scheme plan and because of the narrow right of way and conventional design it was rank C. In 2012 a new scheme plan with greater limited access, grade separation at Memorial Avenue etc was released and we now consider it to be rank B-.



## Group V – Major urban expressways

### F.19 Manukau, Te Irirangi Drive, from Manukau to Botany 5km

This route was proposed in the 1970s and implemented between 1997 and 2000, when it opened for the millennium celebrations. The route is basically a 2+2 divided carriageway with a wide 10m median which gives an opportunity to divide it into a 3+3 carriageway at a later date to provide bus lanes or alternatively use the wide median for a light rail facility. There is sufficient width for a cycle path. There are three pedestrian over-bridges placed strategically near schools and the reserve network along the route. The route is limited access along most of its length and some parts continue this protection by providing slip roads or service roads separated by landscaped margins along the residential frontages. Major intersections are multi-laned on all four approaches. The central median is currently landscaped.

This facility was built, in a short time frame of three years, to modern standards for a multi-lane at-grade signal controlled urban arterial. It was planned as the expressway spine through the Flat Bush suburb and includes good integration and environmental treatment with the adjacent residential areas. It is a strategic route for the further development of Manukau City.

With a 39m right of way, together with some additional widening at selected intersections, it has been possible to integrate the adjacent development so that the arterial road footprint is acceptable to residents and commercial activities on abutting land and at the same time meets the traffic requirements and the needs of the travelling public. The only restriction on the design is the 20m road reserve width which remains a restriction at the Orlando Drive end where widening should be implemented in the future. This is a regional facility which was essential to the development of the Flat Bush area and the creation of links between Manakau City centre, Botany and Pakuranga.

This is ranked A for all four dimensions.

**Figure F.19a Multi-lane roads and light rail**

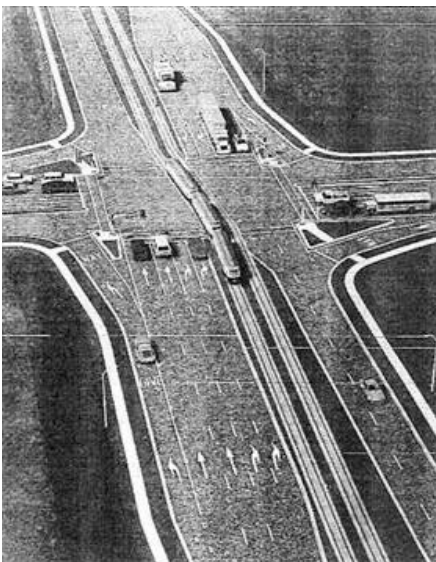




Figure F.19b Planning and designation

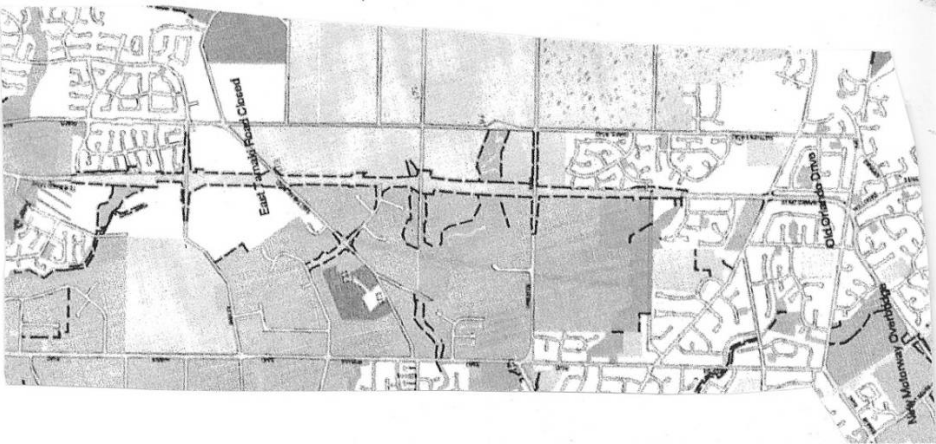


Figure F.19c Street map - opened 2000

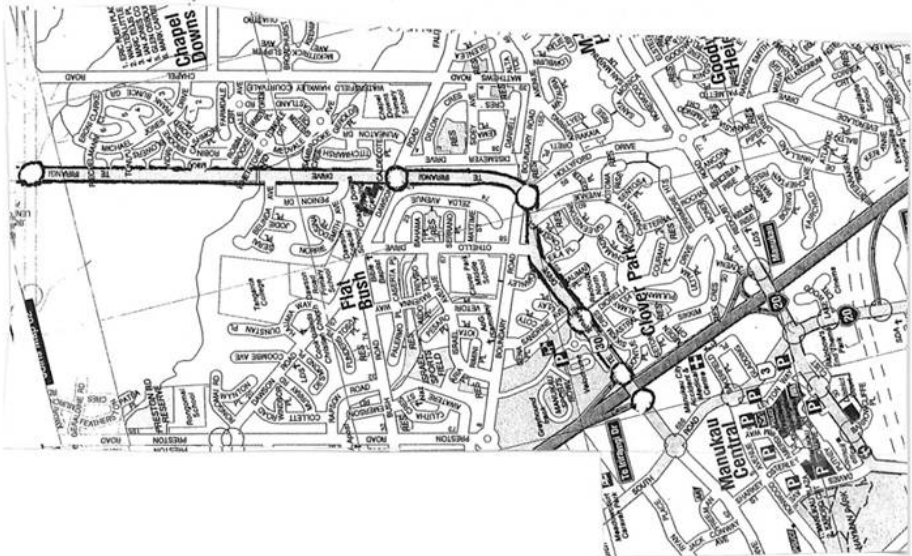
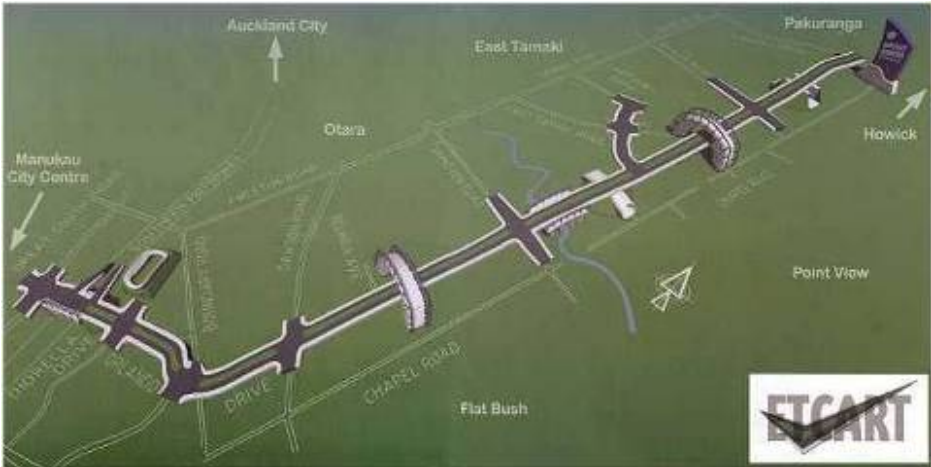


Figure F.19d Te Irirangi Drive concept map



## F.20 Auckland, east west major arterial from St Lukes to Greenlane to Remuera

This Balmoral ring route was identified in the Auckland Master Transportation Plan of 1955. At that time it was seen as a ring road arterial to be widened to develop a dual carriageway. Apart from the Greenlane/Manukau Rd intersection this was never achieved. It is an existing road with continuous frontage development, 9km in length and essentially a 1+1 carriageway within a 20m road reserve. Occasional widening has been taken place with development, eg at Greenlane where a row of houses were removed to construct the Manukau Road intersection and also at isolated locations such as St Lukes and adjacent to Dominion Road intersection where three-lane approaches have been constructed. All major intersections are traffic signal controlled. A minimum 23m right of way has been accepted at some locations although a desirable cross section with a 37m right of way is preferred and this will involve the re-development of a row of houses on several blocks of the route. Access management has been through normal city and engineering road management provisions. The route and intersections are all at-grade.

Right-of-way widening provisions have been made in the district plan but over most of the route these widenings have not yet been achieved. It has been recommended that a 5m widening to create a 25m reserve width and so provide a cycle lane on both sides of the road is essential. Until 2005 there had been no concerted effort to widen the route along its full length and alternative strategies have been explored endlessly.

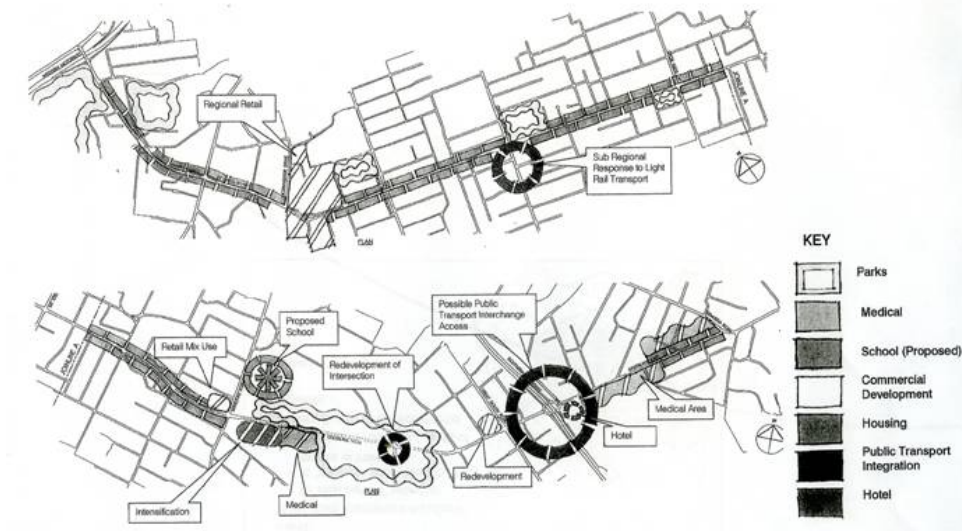
In view of the congestion and ribbon type development of shops at the Main South Road end of the route and at other locations and the lack of any immediate plan to achieve widening and improve the trafficability of this arterial route the sustainability from a traffic and an environmental viewpoint is low. The future proofing of this route does not appear to have yet been agreed. In the circumstances this is another example of an existing road with mixed-use frontage activities where after nearly 50 years the programme of widening and enhancement has not been achieved. In the circumstances pending agreement on how to improve the corridor foot print this route falls into rank C.

Figure F.20a Auckland east west arterial location



Figure F.20b Land-use trends

Land Use Trends



## F.21 Auckland, Esmonde Road Takapuna, Lake Road to motorway

This is an existing road between the northern motorway and Takapuna city centre. It is a 20m section being less than 1km long. It currently has 1+1 lanes in a single carriageway and with parking removal it operates as a narrow 2x2. It is subject to parking prohibitions which are essential in peak hours. The proposal is to take 2m to 3m of additional widening on each side and extend the road reserve to a 26m right of way with some cross sections being larger at 30m. Then two lanes will be placed on each side of a painted or low narrow median. The new road widening line takes the land symmetrically, effectively reducing the front yards to existing properties and in some cases houses are left within 1m of the new boundary.

The improvement of Esmonde Road has been subject to intense design, planning, consultation and district plan consideration. The final compromise is the best in the expedient situation of having to improve the route as the first and major arterial link between Takapuna and the northern motorway with the Bus Rapid Transit Station at the Esmonde Road and motorway interchange.

In the circumstances this must be regarded as an interim improvement. In other equivalent arterial road situations over time one row of houses, in this case on the north side, would have been included in the designation or zoned in a manner that led to their eventual removal and redevelopment on that side of the road. Such a process takes about 30 years.

The Esmonde Road improvements are complemented by cycle lanes on a street to the north which are combined with alternative access to the motorway park and ride. There is also a subway for passing under the motorway. Like the Balmoral situation, it will take a long time of firm management under new zoning and district plan provisions to arrive at an arterial route improved sufficiently to get an appropriate traffic level of service, suitable amenity and a sustainable transport solution.

In the circumstances this route is, at present, in rank C.

Figure F.21a Northern motorway and busway Esmonde Road arterial access Takapuna

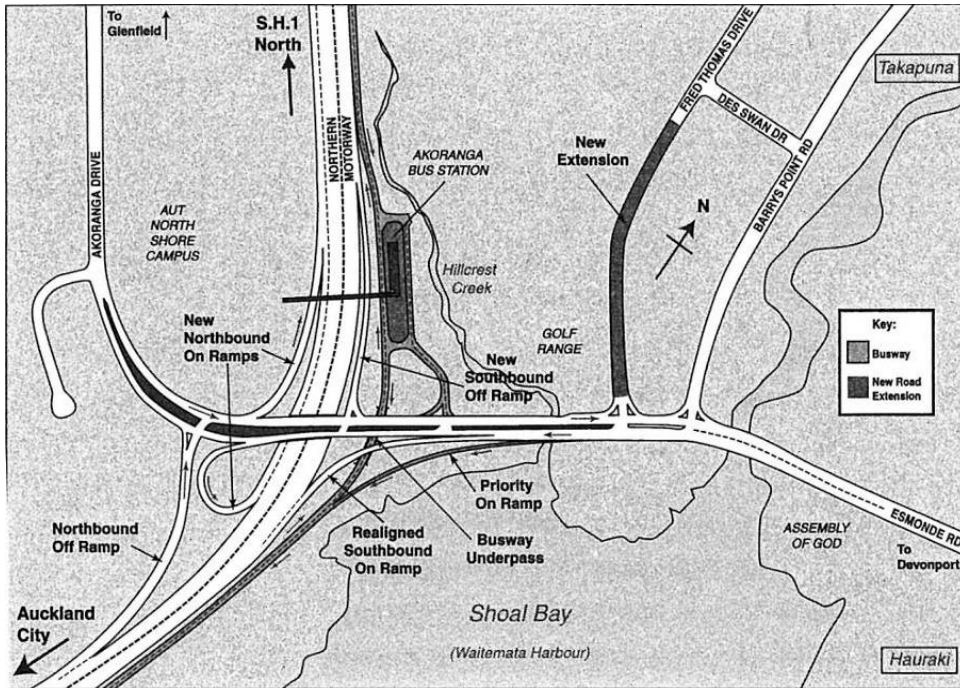
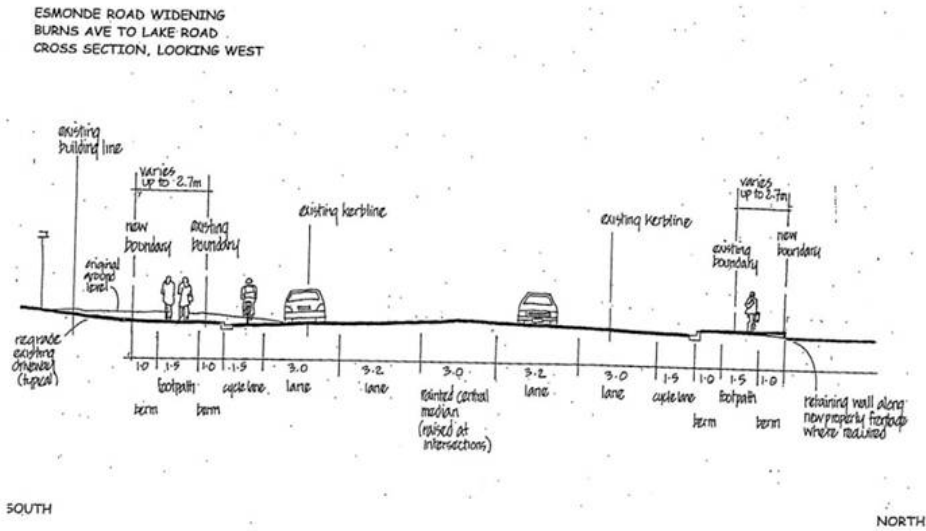


Figure F.21b Esmonde Road cross section after widening



## F.22 Christchurch – Opawa expressway

The decision to redevelop Opawa Road to expressway standards was made in 1967. This is SH74 leading from the west and central Christchurch to Lyttelton Port. Originally a widening line which involved all of the properties on the north-east side of the road was taken to provide for a service lane along the existing south-west road frontage, then a 2x2 land dual carriageway with the removal of accesses to frontages on the north-east side. In the circumstances after 30 years Transit NZ refused to undertake the work at a dual carriage way standard and it was left for Christchurch City Council to make a compromise proposal which retained the ample two-lane 8m service lane together with a 6m margin island with a wide two-lane arterial road. This is placed within a right of way of 33m.

Regretfully the balance of the land originally taken on the north-east side which was intended for the second carriageway of 12m has, since construction, been put on the market again for industrial development with alternative internal access. So in order to achieve a divided carriageway in the future there will need to be another road widening line and purchase made over the next 20 to 30 years.

With the exception of the management of the land on the north-east side the design of the road by Christchurch City Council was excellent with bus lanes, bus bays, cycle lanes, the service road, good treatment of intersections lighting, storm water retention areas and landscaping. Incidentally the new road provided an excellent opportunity for a complete makeover of the stormwater systems in the area and this has resolved a lot of local flooding. In this case after many years of political haggles and disagreements between Transit NZ and Christchurch city, it is gratifying that this stage of the work has provided the service road and the quality of layout based on the original 1967 scheme plans.

Although this proposal meets many operational and environmental criteria, it does not meet the requirements of transport sustainability as the route has not been future proofed by retaining the open space on the north-east side for the second dual carriageway within a longer-term right of way designation. It is possible, however, that a corridor protection zone to permit some transitional uses here might keep the option of future proofing for a second carriageway on this Lyttelton Port access in the future.

At this stage the lack of future proofing drops the rank to B.

Figure F.22a Christchurch Opawa Road expressway

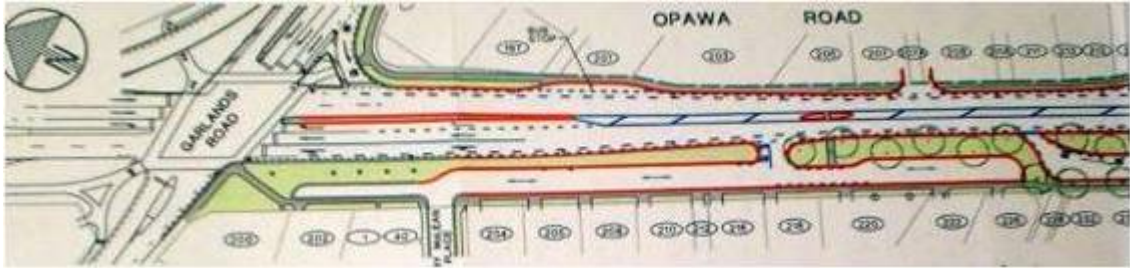
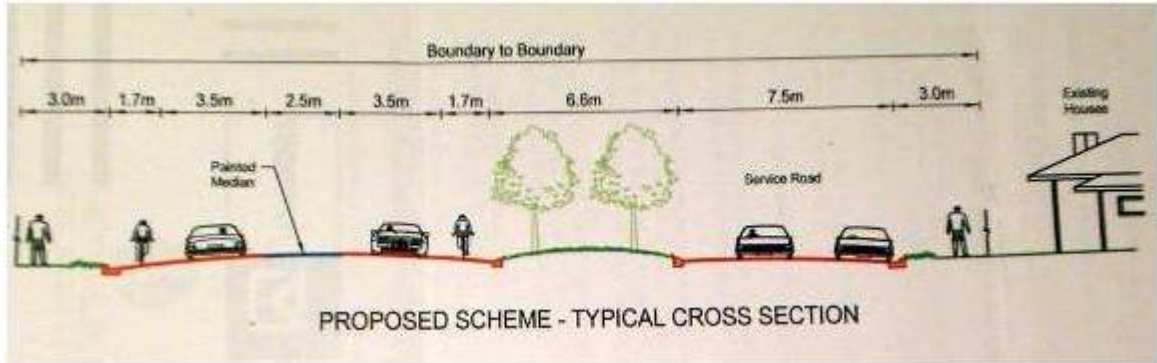


Figure F.22b Opawa Road widening during construction



## F.23 Christchurch, Blenheim Road Mandeville St to Sockburn

This road was built in 1946 by the then Public Works Department and for many years was SH1. Now as a council arterial route it has been reconstructed to good standards, the parking has been stripped off and a cycle lane put on each side. However the capacity is basically that of a 2x2 arterial road and there is no opportunity for future widening. However, this should not be necessary as only 2km away to the south the southern motorway (see sections F.10 and F.11) is currently being constructed. The corridor remains mostly at 30m. However in one length a supplementary road of 10m provides a service road for residential access on the north side. That service road is a good example of mid-1940s state housing design. The route passes through industry on both sides for 2.5km and then housing and residential on the north side. For the balance of the 5km the median upgrading with planting has helped improve the visual qualities of the route. However land-use changes including extensive new bulk retail warehouse and other activities are filling the road with what is essentially 'local visitor attracting' traffic and this has become the arterial road's major function. There are good bus laybys and cycle lanes and at the inner end a deviation of Blenheim Road has recently linked more directly into Moorhouse Avenue. The corridor is fully developed with no room for future growth.

Blenheim Road, while now being a tidy well engineered and landscaped route, has lost its capacity to handle through traffic because of its limited cross section width and conflicting zoning and proliferation of retailing activities. There is no ability to further future proof this route which is now carrying 30,000 vpd. In terms of transportation and environment sustainability this route falls into rank B-.



Figure F.23a Christchurch Blenheim Road

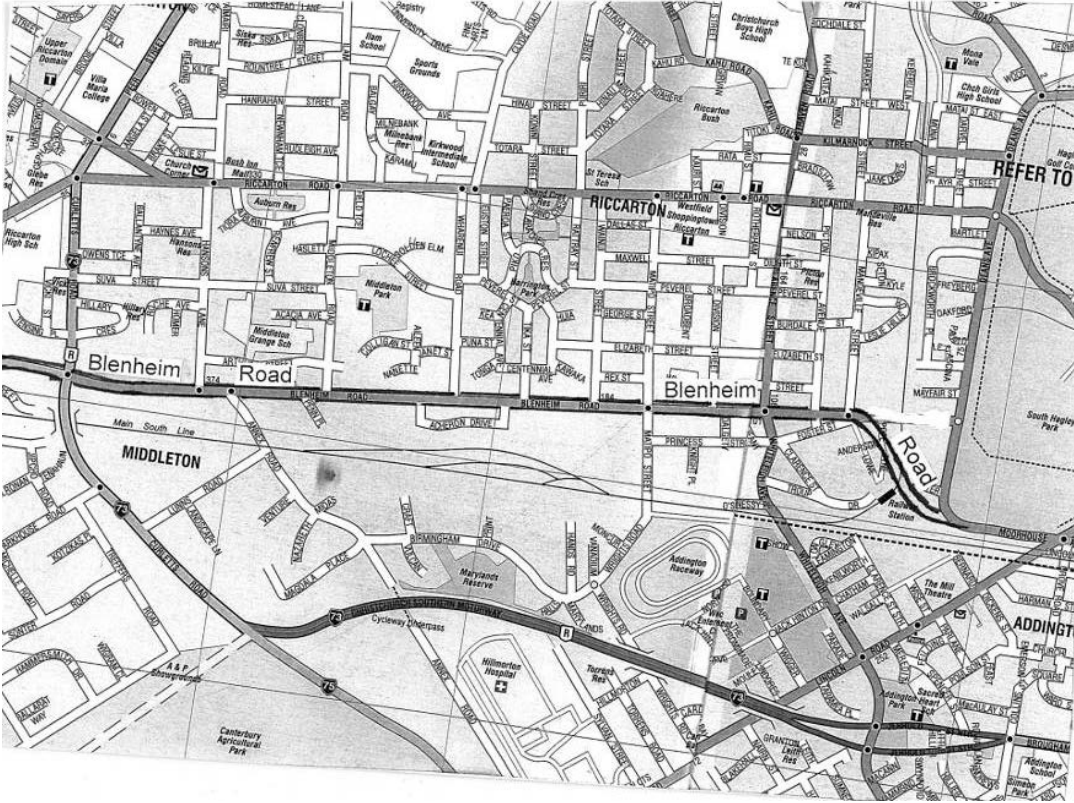


Figure F.23b View of Blenheim Road with residential slip road (behind trees on left)





Figure F.24b Structure study issues and possible solutions

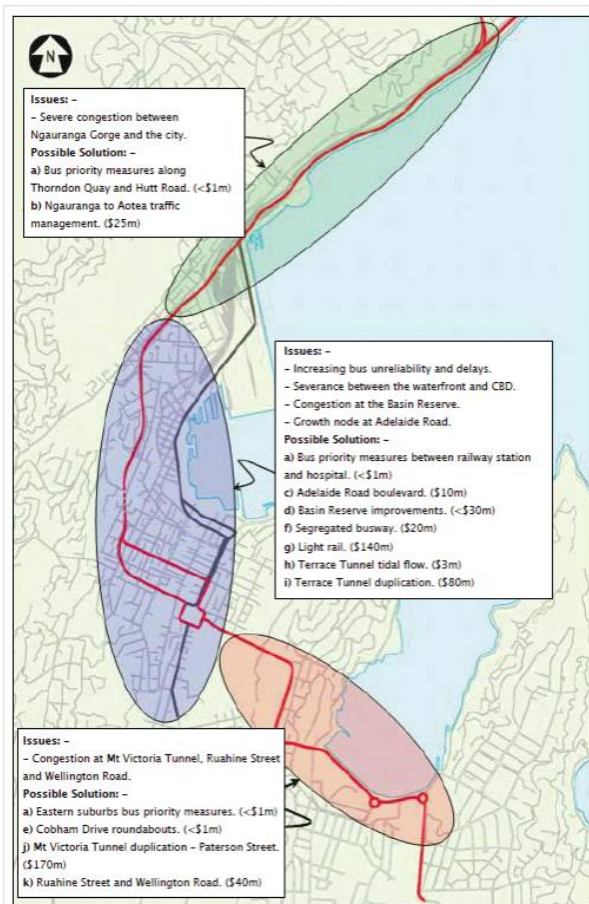


Figure F.24c Potential alignment for grade separated option at the Basin Reserve



## Appendix G: Glossary

AMSP	asset management structure plan
Austrroads	Association of Australian and New Zealand road transport traffic authorities
B/C	benefit cost (ratio and analysis).
CPZ	proposed corridor protection zone
DC	district council
DP	district plan
EPA	Environmental Protection Authority
GPS	Government Policy Statement
HNO	Highway Networks Operation unit (NZTA)
HOV	high occupancy vehicle
IAP	integrated approach to planning
IPENZ	Institute of Professional Engineers, New Zealand
ITA	integrated transport assessment
ITE	Institute of Transportation Engineers (US)
LAR	limited access road
LGA	Local Government Act 2002
LTCCP	long-term council community plan
LTMA 2003	Land Transport Management Act 2003
LTP	land transport programme
MoT	Ministry of Transport
MWD	Ministry of Works and Development (disbanded 1986)
NSHS	National State Highway Strategy (Transit NZ 2007)
NOR	notice of requirement
NZPI	New Zealand Planning Institute
NZTA	New Zealand Transport Agency
NZTA/HNO	NZTA/Highway Network Operations
PPM	<i>Planning policy manual for integrated road transport planning</i> (Transit NZ 2007)
RCA	road controlling authority
RLTS	regional land transport strategy
RMA	Resource Management Act
RoNS	roads of national significance

RPS	regional policy statement
RTA	Roads and Traffic Authority of New South Wales
SH	state highway
TDM	transport demand management
Transit NZ	New Zealand state highway authority until 2008, when it merged with Land Transport NZ to become the NZTA