

Copyright is owned by the Author of the thesis. Permission is given for a copy to be downloaded by an individual for the purpose of research and private study only. The thesis may not be reproduced elsewhere without the permission of the Author.

**ROADS AND RESIDENTS:
MEASUREMENT AND MITIGATION OF
PSYCHOLOGICAL STRESS**

A thesis presented in partial fulfilment of the requirements

for the degree of

Master of Philosophy

in Environmental and Resource Planning at

Massey University

Michelle Lisa Clare

1997



Planning Blight - Madras Street, St Albans, Christchurch - Many property owners along the proposed corridor of Christchurch's Northern Arterial motorway 'lost heart' in the maintenance of their homes. Nearly thirty years of uncertainty over the development of this project took its toll on the local environment and community.

ABSTRACT

Psychological stress, suffered by property owners who are forced to relinquish land for roading development, is difficult to quantify. However, psychological stress can have a significant adverse impact on affected home and business owners. Currently, evaluations of roading projects only include a cursory assessment of psychological stress in the planning balance sheet. The aim of this thesis was to measure psychological stress suffered as a result of the imposition of roading designations and forced property purchases. The main research objectives were to examine whether it was possible to directly quantify the level of psychological stress suffered, and to identify mitigating factors that would reduce the impact of psychological stress.

Forty-four residential and business property owners affected by four roading projects in Hastings and Christchurch completed a questionnaire and face-to-face interview on their personal experience of stress as a result of the roading development. A possible method of measuring stress symptoms and the impact of life changes was tested, based on the Holmes and Rahe Social Readjustment Rating Scale. Almost all interviewees acknowledged that they had experienced some degree of stress because of the roading development. However, results of the stress symptoms and life impact surveys varied and appeared to be more dependent on the individual's circumstances than on the impact of the roading project.

Eighty-five percent of interviewees believed that communication between roading authorities and property owners could be improved. It appears that stress can be significantly mitigated by providing affected owners with more direct contact with roading representatives and regular information updates on the development's progress. The issue of compensation also requires addressing in order to reduce the amount of stress suffered. Currently property owners receive the market value for any land and improvements lost but no other compensation is provided. All interviewees believed that they were financially worse off regardless of whether they were losing all or part of their property. However, where an independent negotiator had been employed to finalise the property purchases, interviewees were more positive and acknowledged that this had helped achieve a win-win solution and a reduction in the level of stress they had suffered.

ACKNOWLEDGMENTS

I would like to take this opportunity to acknowledge the advice, assistance and encouragement that I have received from my supervisor, Mr Derek Williams, Dr Richard Lee and in particular Dr Jenny Dixon, Associate Professor at the Department of Environmental and Resource Planning, Massey University. A very special thank you also to Karen Puklowski, Cartographer in the Geography Department, who magically transformed my rough study locations diagrams into quality scaled maps.

This research would not have been possible without the wonderful co-operation I received from all the subjects interviewed who were directly affected by one of the four roading projects. I know that it was difficult for many of these people to discuss this intrusive impact on their lives and I hope that this research goes some way to increasing the general awareness of psychological stress resulting from roading designations and possibly limiting its future impact on other communities.

I would also like to thank the various officials at the Hastings and Christchurch City Councils, the Canterbury Regional Council, Work Consultancy Services Napier, Transit New Zealand Head Office and the Transit New Zealand Napier and Christchurch Regional Offices for the time they gave to answering my questions and seeking out relevant resource material. The honest responses I received to my inquiries and the willingness to provide as much assistance was greatly appreciated.

And finally to my partner, Blair McCormick, and my family, a very big thank you for your continued encouragement, assistance and offers of advice at just the right moments.

TABLE OF CONTENTS

CHAPTER		PAGE
	Title page	i
	Abstract	iii
	Acknowledgments	iv
	Table of Contents	v
	Table of Figures, Maps, Tables and Plates	vii
1	INTRODUCTION	1
1.1	The Problem	1
1.2	Transportation and Planning Context	2
1.3	Objectives of Thesis	4
1.4	Organisation of Thesis	5
2	LITERATURE REVIEW	7
2.1	Overview of Chapter	7
2.2	Organisational Context	8
2.3	Legislative Context	9
2.4	Road Development Processes	11
2.4.1	Designations	12
2.4.2	Project Assessment and Evaluation	12
2.4.3	Roading Project Costs Imposed on Property Owners	16
2.4.4	Compensation For Psychological Stress	17
2.5	Community Impacts of Roads	20
2.6	Psychological Stress Resulting From Roading Projects	23
2.7	Research Framework	28
2.7.1	Measurement of Psychological Stress	28
2.7.2	Mitigation of Psychological Stress	30
2.8	Summary of Chapter	44
3	EVALUATING PSYCHOLOGICAL STRESS	45
3.1	Research Objectives and Hypotheses	45
3.2	Other relevant Factors to be Considered	46
3.3	Case Study Areas	48
3.3.1	St Albans Section of Northern Arterial, Christchurch	51
3.3.2	Yaldhurst Road, Christchurch	58
3.3.3	St Aubyn Street, Hastings	60
3.3.4	Napier Hastings Motorway	62
3.4	Method of Evaluation	65
3.4.1	Affected Property Owners	66
3.4.2	Questionnaire Design	67

3.4.3	Life Events / Changes	69
3.4.4	Interview Approach	70
3.5	Chapter Summary	71
4	FINDINGS AND ANALYSIS	73
4.1	Overview of Research Approach and Findings	73
4.1.1	Residents' Stress Symptoms and Index of Stressful Events	74
4.1.2	Roading Project Section of Questionnaire	76
4.2	Findings From Each Case Study Area	76
4.2.1	Findings from the St Albans Section of the Northern Arterial	76
4.2.2	Findings From the Yaldhurst Road Widening Project	81
4.2.3	Findings From the St Aubyn Street Widening Project	86
4.2.4	Findings From the Napier-Hastings Motorway Project	90
4.3	Discussion of Case Study Findings	92
4.4	Chapter Summary	92
5.	DISCUSSION OF RESEARCH HYPOTHESES AND CONCLUSIONS	93
5.1	Roading Authority Communication	93
5.2	Other Mitigating Factors	99
5.3	Conclusion and Ideas For Future Research	100
	APPENDICES	101
Appendix 1	Project Evaluation Manual Definition Of Psychological Stress	101
Appendix 2	Research Questionnaires	103
Appendix 3	Personal Correspondence	123
	BIBLIOGRAPHY	124

TABLE OF FIGURES, MAPS, TABLES AND PLATES

Figure	Title	Page
Figure 1	Road Funding Arrangements 1989 to July 1996	8
Figure 2	Road Funding Arrangements From July 1996	9
Figure 3	The Benefits of Compensation versus Willingness to Pay	19

Map	Title	Page
Map 1	Case Study Areas in New Zealand	50
Map 2	Northern Arterial Christchurch	52
Map 3	Yaldhurst Road Christchurch	59
Map 4	St Aubyn Street Hastings	61
Map 5	Napier Hasting Motorway	64

Table	Title	Page
Table 1	Christchurch Population Projections	55
Table 2	Number of Interviewees By Study Site and Amount Property Acquired	67

Plate	Title	Page
Plate 1	Yaldhurst Road Widening	74
Plate 2	Wasteland in the St Albans Section of the Northern Arterial	78
Plate 3	Berwick Street Extension adjacent to proposed Northern Arterial corridor in St Albans	79
Plate 4	Properties Affected in Yaldhurst Road	82
Plate 5	Properties Affected in Yaldhurst Road	82
Plate 6	St Aubyn Street Project Information	87
Plate 7	Residence Cleared from Section for St Aubyn Street Widening	87
Plate 8	St Aubyn Street Construction Site	89

CHAPTER ONE

INTRODUCTION

1.1 THE PROBLEM

The construction of new roads, or the widening or realignment of existing roads can have a significant impact on the surrounding physical and social environment. This is especially so when the impacted area has well established existing uses of the land. Roads are considered to be of sufficient economic benefit, and an asset to society, to justify their imposition over existing land uses in most circumstances. In New Zealand, as in most other countries, the property rights of the existing land owners are set aside in favour of roading developments which, when completed, would be available for use by the wider community.

However, this preference for land use for roading purposes, and the greater good of society, often results in the original property owners being disadvantaged. Property owners are paid what is deemed to be the current market value of their property plus an allowance for shifting but are not recompensed for the *stress* of being forced to move. Property owners may suffer psychological stress as a result of both the threat of losing and the actual loss of their property. This is especially the case when the owners are not in favour of the roading project or the acquisition of their property for this purpose.

The term *psychological stress* is used to describe a group of effects that mentally or emotionally affect people and may have physical and physiological outcomes (Chivers *et al*, 1992). Psychological stress incorporates a large range of emotional elements such as discomfort, anxiety, frustration, fear and fatigue. Hence, the experience of stress varies from person to person depending on their individual circumstances and the details of the property acquisition for the particular roading development.

While it is generally recognised that roading developments adversely impact on existing property owners and cause stress to be suffered, it is very difficult to quantify the size and degree of this suffering of psychological stress. This current lack of knowledge of the magnitude of the impact of psychological stress means that property owners are distinctly disadvantaged should their land be required for a roading development. Consequently, affected property owners are not fully compensated for their loss and the stress imposed on them as they only receive their land's market value. Hearn, who reviewed the Town and Country planning Act 1977 on behalf of the New Zealand Government in 1987, was critical of aspects of the provisions for compulsory acquisition for public works and the composition of compensation. The identification of all costs associated with roading developments, including uncompensated costs imposed on property owners, is crucial to ensure that decisions to proceed with projects are made on a fully informed basis where all the impacts are either avoided, mitigated, remedied or compensated as far as possible.

1.2 TRANSPORTATION AND PLANNING CONTEXT

The demand for transport infrastructure has been increasing rapidly as car ownership has become more accessible. The planning of new roads requires focusing beyond the needs of today's road users to future demands based on economic growth. There are also statutory requirements under the Resource Management Act 1991 to balance these demands with the need for sustainable management and protection of environmental resources.

The avoidance or mitigation of environmental effects¹ has special significance in the area of transportation planning and general roading developments because of the scale of the impacts that road construction can impose on both the existing physical and social environment. During the evaluation of roading projects, prior to their imposition, there is a need to pay particular attention to all of the resulting impacts on the existing environment and for decision-making to be made openly with reasonable public consultation. The importance of the assessment of impacts that major roading ventures

¹ The term "effects" is recognised in the Resource Management Act, in this research its use is interchangeable with the term "impacts".

have on environmental and social intangibles should not be ignored. Any intangible cost that is imposed by a roading project or any resulting degradation of the surrounding environment, represents a substantial burden to all society and consequently should be recognised. The effects should then be avoided or mitigated as far as possible, including the impact of psychological stress.

In New Zealand, the planning for a roading project, designation of land required and obtaining of resource consents, generally precedes the granting of funds. This process can produce uncertainty particularly for affected land owners whose property rights are severely restricted by the designation yet are unable to leave the property as funding for property purchase is usually tied to the overall approval of funding for the project.

Funding for roading projects usually comes from a combination of central and local government funding. If the roading project concerns a State Highway then funding is entirely derived from central government. However, all roading project proposals are required to be evaluated using cost benefit analysis before any central government funding is made available. Evaluations are conducted by the road controlling authority proposing the project and then submitted for consideration to Transfund New Zealand, the central government agency responsible for road funding. Depending on the status of the particular road, the road controlling authority will either be Transit New Zealand that have responsibility for all State Highways, or a territorial authority such as a district or city council that has responsibility for all other roads.

Land identified as being required for any public roading development must be designated for this purpose and the affected property owners formally notified of the designation and land requirement. A designation for the purpose of the construction or widening of a road is requested by the Minister of Transport and requires provision to be made in the relevant district plan. The legislation providing for these powers and processes is contained in the Transit New Zealand Act 1989, the Public Works Act 1981 and the Resource Management Act 1991.

The Resource Management Act 1991 also requires that a variety of resource consents be obtained before any work on the road can commence. The process of applying for the

required consents provides the opportunity to debate merits of the project through wide public consultation. However, this process normally takes several years for issues to be resolved before there is certainty that a project will proceed.

Roading projects affected by planning and funding uncertainty can be particularly confusing, frustrating and stressful for affected property owners. While it is slowly being determined whether a project will proceed, owners of designated properties have to live with restricted property rights and the prospect of finding no buyers even if they were to try to sell. Even the issue of compensation for the affected owners may actually add to the stress suffered. The level of compensation is limited to the cost of the actual property lost, shifting costs, conveyance fees and, in some cases, a maximum additional payment of \$2,000. These compensation payments cannot be determined until the property is purchased by the roading authority which is usually not until funding is approved.

1.3 OBJECTIVES OF THESIS

The aim of this thesis is to attempt to measure the level of psychological stress suffered as a result of the imposition of roading designations and forced property purchases on both affected residents and business operators, and to identify ways of mitigating psychological stress in these situations. The first research objective is to examine whether it is possible to directly quantify the level of psychological stress suffered. It is currently recognised that psychological stress can be suffered by residents as the result of their property being acquired for roading. However, the extent of the prevalence of psychological stress and the degree to which property owners are affected is relatively unknown. One possible method of analysing psychological stress is developed and tested in order to ascertain whether a more detailed analysis of psychological stress was possible as opposed the inclusion of a brief description of its presence as currently required in the Transfund New Zealand Project Evaluation Manual. It is envisaged that once the level of stress has been established, better means of reducing its effects can be developed.

The second research objective relates to the investigation of mitigating factors that would reduce the impact of psychological stress. Having established that stress is being suffered by property owners, it is important to identify the main contributing factors, and to investigate whether these factors could be reduced or eliminated entirely in future roading developments. The experiences of residents and business operators directly affected by property acquisitions for roading purposes have been drawn on largely in order to examine how the transportation planning and property acquisition process could be further improved so that the impact of psychological stress is reduced and assistance can be tailored specifically for those requiring it.

1.4 ORGANISATION OF THESIS

Chapter one of this thesis provides a broad introduction to this research and outlines the main objectives. Chapter two contains a review of the relevant literature on transportation planning, project evaluation and psychological stress in the context of road planning and construction. An outline of the organisational and statutory context for this research is also provided.

Chapter three presents the methodology used for this research in to psychological stress. The research questions are identified along with the survey design and commentary on the pilot testing of the questionnaires for the semi-structured interviews and the application of the survey. An outline of the four case studies is provided in this chapter, including the background of the roading development and summary of the survey participants from each location.

Chapter four discusses the main findings of each of the four case studies and compares the findings from the four locations.

Chapter five provides further analysis of the results in the context of theoretical principles developed in Chapter two. The research findings are presented along with recommendations for alterations to the existing procedures for dealing with property

owners who are forced to relinquish land for roading purposes. The chapter concludes with recommendations for further study.

CHAPTER TWO

LITERATURE REVIEW

2.1 OVERVIEW OF CHAPTER

This chapter outlines the organisational and legislative context for the construction and management of roading in New Zealand. An examination of the statutory processes required to construct or alter a road is also covered. The context in which roading management and development operate has changed considerably over the past ten years with the deregulation and growth of the transport sector. Legislative changes range from initiatives directly affecting the transport sector to wider impacting changes to New Zealand's planning environment. Transport related legislation has focused on the establishment of new crown agencies responsible for the management and funding of roading, and the deregulation of service provision, both in the area of public transport and in roading construction and maintenance. Complimenting these changes to transport legislation have been the introduction of new planning and development requirements in the form of the Resource Management Act 1991. Aspects of the Resource Management Act, such as the sunset clause of five years placed on designations, were introduced specifically to address some of the previous deficiencies in legislation relating to roading developments, and in particular their impact on the surrounding environment, both physical and social (Hearn 1987).

Relevant literature, relating to transportation, environmental impact assessment and the occurrence of psychological stress within the context of transport planning and development, is also examined in this chapter. Little has been written directly on the relationship between psychological stress and roading developments. However, psychological stress resulting from urban redevelopment projects has been studied. These studies are reviewed in conjunction with literature on the identification and measurement of psychological, and causal relationships. From this literature, a framework for investigating the effects of psychological stress on residents and business

owners affected by roading projects has been developed. This framework provides the methodology used to survey the incidence and level of psychological stress of affected property owners within the New Zealand roading context.

2.2 ORGANISATIONAL CONTEXT

In New Zealand, prior to 1989, the Crown's National Roads Board was responsible for the management and funding of major roading projects and State Highways. The day to day administration and the investigation, design and construction of new roadways was undertaken by the Ministry of Works and Development. As is still the case, territorial authorities, such as borough, county and city councils (now known as district and city councils) were concerned with the management, construction and maintenance of local roads within their jurisdiction.

In 1989, the new Crown entity, Transit New Zealand was established. Transit New Zealand was responsible for the Crown's funding of roading and passenger transport, as well as the management and construction of State Highways. Transit New Zealand was required to evaluate all proposed projects for local roads and State Highways in order to annually allocate funding on a national basis (refer Figure 1).

Figure 1 Road Funding Arrangements from 1989 to July 1996



In July 1996, the funding and project approval role was transferred from Transit New Zealand to a new Crown entity, Transfund New Zealand. The role of managing State Highways remained with Transit New Zealand. At the time research for this thesis was conducted, Transit New Zealand was still the central government funding agency for roads.

Figure 2 Road Funding Arrangements from July 1996



2.3 LEGISLATIVE CONTEXT

Legislation relevant to roading development in New Zealand is spread across a number of statutes. Provisions to acquire land, and to construct new or alter existing roads are currently contained within the Resource Management Act 1991, the Transit New Zealand Act 1989, the Local Government Act 1974, the Public Works Act 1981.

Roads are defined as a physical resource and, as such, the Resource Management Act promotes their sustainable management (*Transit New Zealand v Invercargill City Council* 1992). Under the Transit New Zealand Act, the Minister of Transport may construct or repair any road within any part of New Zealand. Powers under this Act also extend to the protection of state highways from the impacts of surrounding land use in the form of access restrictions to these roads. Restrictions to state highway access are considered where the through travel of vehicles using the highway is disrupted by excessive volumes of traffic entering from or exiting to side streets. These powers are complimented by provisions under the Local Government Act which permit territorial

authorities to construct, maintain or alter public roads within their jurisdiction. Such wide ranging powers illustrate the importance accorded to roads and their priority over other alternative land uses. Powers under the Resource Management Act and the Transit New Zealand Act also specifically provide for designations for future public roads. The construction of any new road or section of road is subject to the resource consent application process of the Resource Management Act while the maintenance of an existing road is treated as a permitted activity in district plans prepared under this Act. This permits a wide range of work associated with roading to be undertaken as of right.

Where land is identified as being required for a particular road development, the Minister of Transport issues a notice of designation requirement to the territorial authority that has jurisdiction over the area. A designation under the Resource Management Act means a provision is made in the district plan to give effect to a requirement requested by the appropriate requiring authority. Transit New Zealand is recognised in legislation as a requiring authority in relation to the construction and operation of a state highway or motorway. Previously, designations were imposed under provisions contained in the Town and Country Planning Act 1977. Designation provisions, up until their transfer to the Resource Management Act in 1991, contained no obligation for the roading authority to consult with land owners affected by the designation. Hence, the first many property owners knew of a designation was a notice sent to outlining the resulting limitations that had been imposed on their property rights. Under the Resource Management Act, Section 168, a notice of requirement from the Minister must now include amongst others, a statement of consultation that the requiring authority has had with people affected by the designation, public work, or project. Affected and interested parties also have the right to object and be heard in relation to any requested designation. This process enables debate well in advance of any actual project construction and ensures public consultation is undertaken early on.

Authorities requesting designations for public works, such as roads, are now required to fully justify their site or route selection and the extent to which alternatives have been considered. They must also identify the effects that the development will have on the environment, and the ways in which any adverse effects will be mitigated before a

designation request is considered. Designations under the Resource Management Act are restricted to a “sunset” after five years from the date the designation was included in the district plan. This means that unless sufficient progress on the project has been made, then the designation is removed from the district plan. This is a significant change in legislation from the Town and Country Planning Act 1977 which allowed designations to be imposed over land indefinitely without any development occurring.

The Public Works Act 1981 has far reaching powers, including the forced acquisition of land owned by private individuals for the purposes of building or altering a road. However, prior to land being forcefully taken a number of steps are required to be followed and more often than not, these result in the agreed sale of the land to the Crown by the owners. Under Section 18 of the Public Works Act, the Minister of the relevant government agency requiring the land must serve notice of the desire to acquire the land on every person registered as having an interest in the affected land and lodge a notice of desire to acquire the land with the District Land Registrar against the title affected. The owner of the land is advised of the estimated amount of compensation they would be entitled to based on the valuation by a registered valuer and invited to sell the property to the Crown. The Crown, in the form of the roading authority, is required to negotiate in good faith with the owner in order to reach an agreement for the acquisition of the land. If an agreement can not be reached, or the owner does not respond or refuses to negotiate then after a period of 3 months and once the owner has been notified, the land can be proceed to be forcefully taken under the Public Works Act, and is known as forced acquisition.

2.4 ROAD DEVELOPMENT PROCESSES

The construction of a new road or alteration of an existing one requires a number of specific processes to be followed as part of the statutory requirements. These involve the evaluation of the project prior to the approval of funding and the designation of the land required.

2.4.1 Designations

Implementation of plans for new roads and alterations to existing roads often involves the use of designations on the particular areas of land needed for the development. Designations for land required for public projects, such as a road or a motorway, under the Public Works Act 1981, are imposed through provisions made in district plans. The requirement for a designation is acknowledged in the form of a notice sent by the Minister of Transport (as the Minister in this case responsible for the work's funding) to the local authority concerned and must comply with the details of Section 168 of the Resource Management Act 1991. An environmental impact assessment detailing the effects of the project on the surrounding area is required to be presented to the local authority at this stage, accompanied by details of the alternatives available and the ways in which impacts have been mitigated.

The imposition of a designation on land, metaphorically speaking, puts a freeze on its use in anticipation of the commencement of work on the public project by preventing any change in;

"the character, intensity, or scale of the use of the land - that would prevent or hinder the public work to which the designation relates" (Resource Management Act 1991 S.176 (b)).

The freeze on use aims to lessen the economic impact of the roading development on both the landusers and the purchasing authority. This is achieved by restricting normal property rights and thus preventing sunken costs in the form of spending on property renovations and additions, whose benefits will not be fully realised or costs recuperated in the period before the property is acquired for roading construction.

2.4.2 Project Assessment and Evaluation

Under the Resource Management Act 1991, the environmental effects resulting from new roading projects must be assessed. Significant potential environmental effects must

be taken into during all development stages. These effects include the matters listed under the Fourth Schedule of the Act such as:

- socio-economic and cultural effects on the neighbourhood and wider community
- physical effects including landscape and visual effects
- effects on ecosystems and natural habitats
- effects of noise and the discharge of contaminants
- effects on natural and physical resources having aesthetic, recreational, scientific, historical, spiritual or cultural or other special value for present or future generations
- the relationship of Maori and their culture and traditions with their ancestral lands, water sites, waahi tapu and other taonga.

The means by which adverse effects are to be mitigated are required to be identified early in the planning process when the designation is requested. The assessment of environmental impacts and their mitigation can then be incorporated into the road design and the costs associated with their elimination or mitigation can be identified and accommodated within the roading project's overall budget.

All proposed roading projects in New Zealand must be assessed on an economically comparable basis using Transfund New Zealand's Project Evaluation Manual. This Manual, which prior to 1996 was the responsibility of Transit New Zealand, uses an evaluation method based on a social cost benefit analysis and a planning balance sheet to incorporate all economic and environmental factors. The Benefit Cost Ratio is calculated by dividing the project's total national benefits by its total costs. This ratio is then used to rank all roading projects from the highest Benefit Cost Ratio to the lowest in order to allocate funding across projects on a national basis.

Traditional cost benefit analysis uses economic efficiency and market prices as the main criteria of assessment which works well with quantifiable variables such as roading materials but has difficulty incorporating intangibles at an appropriate level of importance. Steiner even goes as far to comments that:

“Usually too much emphasis is placed on technical and economic considerations and too little thought is given to the people directly affected” (91,1978).

The evaluation methodology used to assess roading projects in New Zealand attempts an assessment of the relevant intangible factors. Intangibles such as psychological stress, noise, vibration, air pollution, community severance, ecological impact, visual impact and historical/ cultural impact are quantified as far as possible. If this is not possible, then their intangible effects are listed appropriately in the balance sheet. A complication exists here in that direct social impacts of a transport project such as psychological stress and severance, are not easily assessed before the actual impact occurs. It is difficult to predict the exact reaction and ensuing behaviour and adjustment of inhabitants ahead of the stimulus actually being imposed (De Boer, 1986).

The role of intangibles, such as psychological stress, is being increasingly acknowledged as important input but their integration into the evaluation process appears to be hampered by the lack of suitable assessment methods. The examination of intangibles in Transfund New Zealand's Project Evaluation Manual acknowledges these as constituting an important component in the cost benefit analysis of roading projects, but at present does not provide tools to assess fully and comprehensively, the value of those items for which no market place presently exists. The directive regarding the intangible of psychological stress, contained in the appendices of the Project Evaluation Manual, specially states it is a legitimate intangible which requires evaluation. The section relating to the assessment of psychological stress contained in the Project Evaluation manual is reported in Appendix One.

The assessment of psychological stress as part of the evaluation process is effectively limited to occasions where there has been forced property purchase. However, the definition of forced purchase is limited to the extreme cases where property purchase negotiations have failed and the property is obtained by the roading authority under the Public Works Act 1981, without the consent of the owners. Generally a *forced* purchase would not occur and the degree of uncompensated distress or discomfort to the owners would be considered as negligible in the economic evaluation.

This explanation of psychological stress in Transit's Project Evaluation Manual (1994, A7-12) notes that;

“if the property owners are compensated for their distress through a mutually agreed price then the intangible considerations can be ignored.”

This limited consideration of the level of psychological stress distorts the real impact that is inflicted on property owners affected by a roading designation. It fails to take into account the stress that can be suffered from the time the owners receive the notice requesting the purchase of their property, through negotiations, the eventual shift to their home and the period required to settle in to their new surroundings. This length of time between the start of the acquisition process and its completion can span many years, as once a designation is imposed, resource consents must be obtained and in the case of a major road can take up to 10 years. As Chivers *et al.* (1992, 46) note;

“...the time this process takes and its effect on those wanting to buy or sell property near the proposed road over that period exacerbates this stress for a large number of people.”

This stress is not formally recognised and taken fully into account in roading evaluation. The majority of owners reach some sort of negotiated settlement for the sale of their property once it has become designated for a roading project. This settlement may occur rapidly or may be the result of long, and possibly heated discussions. Either way some degree of stress is inevitably suffered as a result of the whole designation process having been forced on these property owners. However, it is recorded in a limited and indirect manner in a project evaluation in the form of the total number of properties required and some sort of brief observation as to whether there is resistance to proposed property purchase.

Ultimately, all the benefits and costs accruing to whosoever should be evaluated and assigned a value in any cost benefit analysis. In order to complete the full evaluation of roading projects, it would be desirable to assess in monetary terms this obvious but as yet largely unaccounted for adverse impact of psychological stress.

2.4.3 Roothing Project Costs Imposed On Property Owners

The internalised cost of major roading projects are born by the roading authority, Transit New Zealand, often in conjunction with the local authority. These are the tangible costs that can be identified and included in the evaluation but do not fully take account of external costs and benefits that are derived from the improved roading structure. In 1972 the British Department of the Environment comment in their report on urban motorways that;

"direct costs had received most of the attention while indirect costs imposed on people living nearby had the least attention" (p3).

In the New Zealand context, the issue of imposing costs on those people with properties adjacent to roading developments is still to be adequately addressed and compensated. Hence the affected community are often left to absorb more than their fair share of the incidental roading costs. While society as a whole enjoys the benefits directly of the new facility and indirectly through the reduction in use of alternative routes and other means of transportation. It is important that these indirect costs and benefits of such roading schemes be examined with the same care as the direct costs and movement benefits. Christiansen and Jackson express this sentiment in their observation that;

"practically every person and business which must move, is injured far beyond any benefit which they would derive from the new road" (cited in Dickey 1975, 244).

Differential costing allocation also exists with distinct individual differences in costs that are incurred, both for those forced to relocate their residence and also for those who remain in the community area adjacent to the road. The danger of using an almost entirely quantified, integrated and sophisticated evaluation method such as Cost Benefit Analysis is that it can distort the consideration of intangibles. These intangibles or non-quantifiable effects may easily be over or under weighted in their estimation in the evaluation. The aspect of psychological stress is not solely the result of the impact of the roading project on any one single variable and affects all residents living within the

impacted community to differing degrees. Whilst the desired aim of any assessment of the presence of psychological stress in a community is to establish its relative contribution in monetary terms within the overall project confines, it is equally vital to bear in mind the difficulty in attributing the observable level of stress suffered by property owners to solely one cause, the roading designation and development. Psychological stress can also result from other areas in people's lives, such as their employment or social relations, and not necessary be totally related to the impact of the roading development. The separation of psychological stress on a causal basis is very difficult. In any case, the consideration of psychological stress needs to be acknowledged that its suffering is not easily attributed to solely one cause or converted to compensation in dollar figures.

2.4.4 Compensation For Psychological Stress

Compensation above the market price paid for a property required for roading is not new. Provisions exist for a solatium payment of up to \$2,000 (increased from the earlier sum of \$500) to be made in some circumstances where the purchase of a property has been met with some degree of resistance. This solatium is a payment in recognition of personal distress or inconvenience, it is not necessary for the property to have been forcibly purchased in order to receive this compensation.

The solatium payment is based on the principle of equivalence, that is the recipient is no better or worse off than prior to the designation on their property. Unfortunately in most circumstances this would not appear to be the case. The principle of equivalence is presently applied to the acquisition of land so that compensation is proportional to the loss sustained by the owner but this only relates to the land's market value and not its value to the owner. Hence at present "*full*" compensation is not being received and the burden of psychological stress is borne by the property owners affected with little assistance to alleviate the impact and no attempt to compensate for it.

Often where a designation has been imposed along the route of a proposed carriageway, the last owners to sell their properties to the roading authority at the market price are

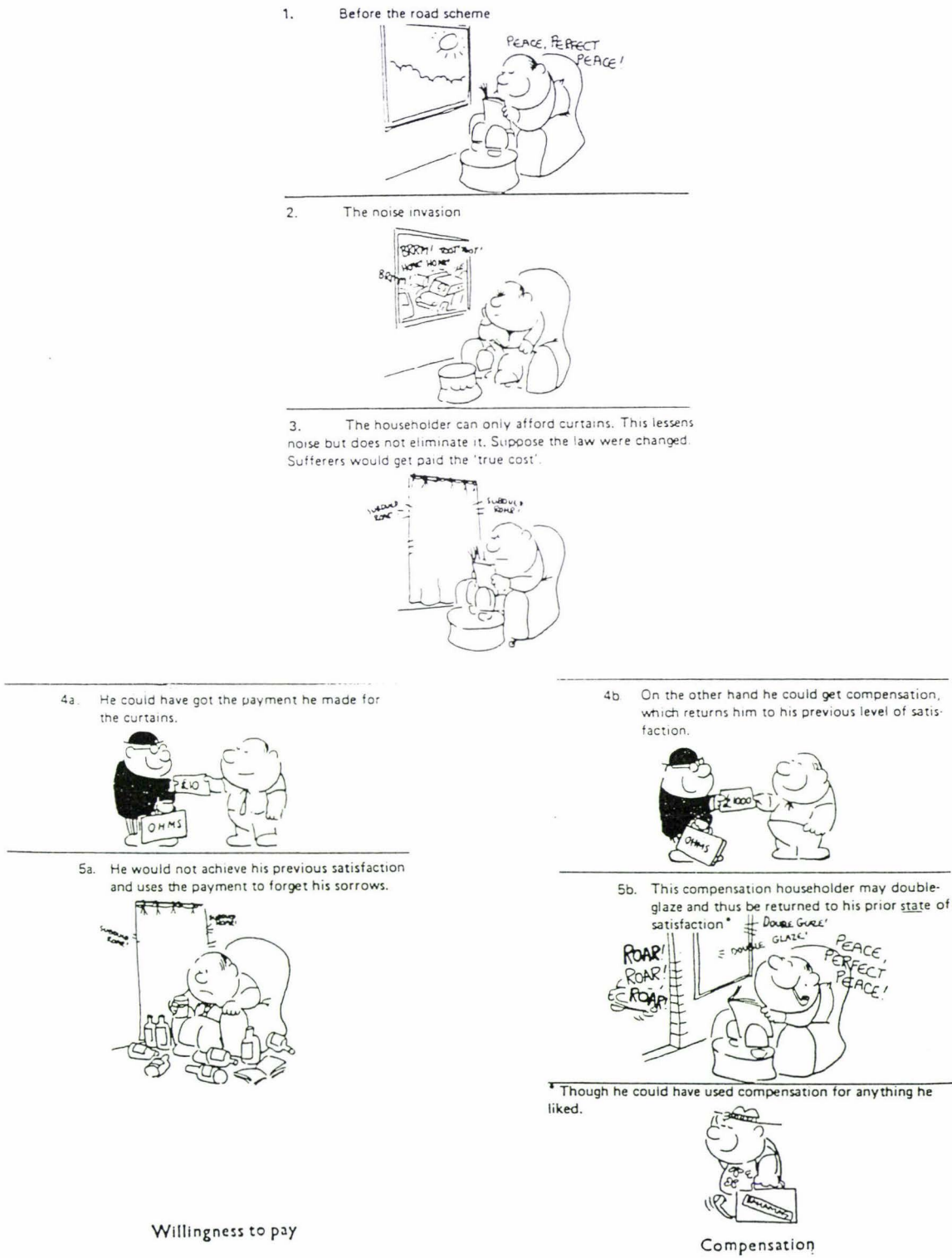
affected by the drop in demand for such affected properties and the corresponding market price decrease. The market value of property can also be influenced by non-market forces in cases where a roading designation has been imposed on a community for up to 30 years. Obviously when given a choice, people investing in a home will elect to purchase a property away from a potential motorway unless the purchase price is low to compensate for potential indirect effects and disruption. Even when the solatium payment is included with the market price for the property, the owners are generally in a worse position than had there been no designation

Anthony Hearn QC, in his 1987 review of the Town and Country Planning Act 1977, commented that there should be more provision for an open market approach, where property rights are significantly interfered with for a community benefit, then that community must be prepared to pay for that benefit. If it is not then it should refrain from interference and accept the consequences.

Lichfield (1972) points out that property prices in an area affected by a proposed roading project may start to decrease once knowledge of the project becomes public knowledge. By only paying an affected property owner the current market price at the time of purchase, any earlier loss of property value is not recognised or compensated. Lichfield (1972) also compares the two methods that can be used to counteract the adverse effects of roads. The benefits of compensation compared to a willingness to pay approach are illustrated in Figure 3, on the next page.

There appears to be potential to increase the amount of compensation paid to those affected owners as one way of addressing the suffering of stress resulting from a roading designation and subsequent property purchase. This is one aspect that will be further investigated in this research, along with other ways to decrease the impact of psychological stress.

Figure 3 The Benefits of Compensation versus Willingness to Pay
(Lichfield, 1972, 164)



2.5 COMMUNITY IMPACTS OF ROADS

The relationship between the location and operation of transport facilities and land use is one of interdependence. Brindle cites 'Buchanan's law' and the importance that it places on the;

"three-way relationship between the quality of the environment, the level of accessibility and the cost urban communities are prepared to bear in changing the structure of the existing area" (Brindle 1981, 187).

This has specific relevance when considering proposed roading alterations and additions through established residential communities because of the huge cost involved. Environmental quality and accessibility of the affected community, as well as reparation, are directly related to the cost that society as a whole is prepared to accept in return for the new improved roading facility. The benefits that the general public gain from the new roading facility and the increased accessibility it provides, must be weighed against the type of environment created and imposed on the adjacent community. Emphasis is given to the minimisation of the roading project costs but, particularly during construction, it is vital that an acceptable environment and ease of access to facilities is maintained for affected residents and business operators. Consideration needs to be given to maintaining basic services and amenities so as not to further inconvenience affected property owners. The maintenance or immediate rehabilitation of the surrounding environment is important to the local community. The amelioration of damage, landscaping and planning for the often ignored non-motorist users, such as pedestrians and cyclists, in the road corridor also result in benefits to the community that should not be sacrificed because of a purely financial focus based benefits to the immediate new road users.

The social impacts of infrastructure alteration can be immense and may even exaggerate differences in accessibility already there, as De Boer notes; "the existing distribution of access may be changed even more radically by the physical characteristics of traffic and infrastructure" and can result in the isolation of some residents (1986,19).

Nevertheless, historically speaking, it is the street patterns that have endured over time, rather than the buildings (Kerensky, 1968). This has been largely because of the nature of the land tenure, the space between roads is almost entirely private property and hence is subject to all the rights that private ownership entails. Disruption of private space for the purpose of public works will not be tolerated without some sufficient form of compensation being offered in return. In addition, land use may undergo dramatic changes over a long period of time and this change may also be reflected in the nature of the buildings on the site. Physical constructs, such as homes and business premises, have a finite life span and at some point in their existence the option of rebuilding will be favoured over any restoration efforts. In such events it is the street layout that survives and remains the dominant influence on the development of both the environmental, and to a lesser extent, the social surrounds.

Severance resulting from a new roadway dissecting an established community has been noted as another significant detrimental impact. It can adversely affect on the accessibility of residents living in the surrounding community and contribute to the suffering of psychological stress. Major roads and motorways often deter and may even prevent movement across their line due to the vast quantities of traffic using the facility and the high speed of vehicles travelling on them. The prevention of movement across the road corridor may also be the subject of legislation in the interests of safety. De Boer observes that;

"Destinations relatively near are virtually placed out of the reach of pedestrians when road connections are disconnected or when existing roads become increasingly dangerous to cross" (1986,19).

The space occupied by the motorway is a significant psychological barrier to the residents and will affect the behaviour of residents in close proximity to it. Cline (cited in De Boer 1986) comments that a motorway may be seen as a gap or gash through the community, serving to separate people from each other and from vital facilities. A new roading infrastructure, according to De Boer,

"acts like a barrier, frequently destroying the existing social fabric by carving a corridor through built up areas" (1986,3).

Kerensky comments that;

"severance is an often quoted objection to the construction of a motorway by communities" (1968,10).

In order to gauge potential severance it is important to establish the identity of the community which will be cut up by the traffic route as well as the social groups it encompasses. The impact of severance is meaningful, according to Kerensky, if it is given in context, that is;

- "a) such social groups exist in an identifiable form and;
- b) the major traffic route is destructive of social ties between the members of the social group" (1968,10).

The consideration of all existing local access routes and the community boundaries should occur during the initial phases of the road corridor selection, instead of being relegated to a band aid status factor at the completion of the roading construction, as is generally the case at present (British Department of the Environment, 1972). It is important that existing patterns of pedestrian and cycle travel by the local community are identified prior to a project commencing. However, these patterns do change over time and many people do not necessarily prefer the most direct route of travel but may have a preference for the more aesthetically pleasant route.

In order to combat the occurrence of severance, it should be the aim of roading projects, as far as possible, to construct new road links along the same line as existing barriers between communities, such as railway, open spaces or industrial green belts (British Dept of the Environment). The accentuation of already established edges to community districts may be viewed as institutionalising these differences between areas. Interaction may further be affected but at least in these circumstances, this would represent a smaller imposed cost to society than the development of the new roading infrastructure through the middle of an integrated, established social entity.

2.6 PSYCHOLOGICAL STRESS RESULTING FROM ROADING PROJECTS

Individual diversity is a major problem that exists in the evaluation of the psychological stress levels amongst the residents and business operators affected by a roading development. There is a large amount of variation between individuals' perceptions and their interpretation of events in direct relation to their own particular lives. This range of perceptions and interpretations amongst individuals produces an equally immense variety of individual reactions to the same event. It is this diverse range of reactions by residents and business operators that needs to be acknowledged fully in roading projects and considered with the appropriate level of understanding and compassion where necessary.

The intangible aspect of psychological stress appears to be most relevant during the corridor selection and designation stages in the planning of any new roads or in the alteration to existing roading alignments. This thesis will investigate methods of evaluating the amount and specific cause of psychological stress that are suffered by people, directly and indirectly affected by roading proposals. An examination will also be made of the ways of quantifying these results and the subsequent establishment of the best means of providing adequate and fair compensation and assistance for these people, taking into consideration this aspect of stress suffering. The measurement and projection of the external impacts of roads on the environmental and ecological features, and in social and economic activities has been a relatively under-developed area of research (Gakenheimer and Wheaton, 1976). This is slowly beginning to change. De Boer (1986) points out that in the United States there have been intensive efforts to develop measuring instruments and other complex social indicators. This research is;

"not primarily out of sympathy for the residents but rather in order to develop objective criteria for decision-making on particular locations or plans, in view of the generally strong resistance to the construction of public works" (De Boer 1986,11).

In New Zealand, an investigation by Works Consultancy Services into the incorporation of social and environmental issues into road project evaluations commented that;

"traditionally Environmental Impact Assessments have been undertaken as a separate exercise from traffic and engineering investigation" (1991,1).

They now recommend a more integrated approach to the overall project evaluation as well as improved organisational integration between the main road governing body, Transit New Zealand, and the particular local authorities concerned, in order to ensure that projects are accepted locally as well as nationally (Works Consultancy Services, 1991).

Cline makes a critical observation of the world-view used in the traditional planning of road linkages and faced by residents or businesses attempting to alter the set plans of professionals, in the following quotation:

"these people will be challenging a critical and implicit (rather than explicit) assumption of highway designers - the space between the points joined by a freeway is a social wasteland, devoid of human significance" (cited in De Boer 1986,41).

Fortunately, the lack of any social or overall environmental projections is slowly being eliminated from the transport planning sector as public institutions become more accountable and spending comes under increased scrutiny. As De Boer points out:

"transport is valuable only if it contributes to non-transport ends and therefore it must be integrated with planning in other domains, stressing its function for integrating the local community" (1986,13).

One obstacle in the protection of local communities, through the integration of land use and transportation planning, is their lack of identification and associated definition in district plans. Community boundaries are difficult to define and views on them vary from person to person, yet every resident can immediately identify themselves with a local community. Ackley (1987) in his evidence to the Planning Tribunal in the matter of the Northern Arterial, Christchurch concluded that communities need to be identified. Ackley suggested the use of focal points in areas would be a good way to officially establish recognisable communities areas, including social ties and lines of communication, and hence protect these against unnecessary severance.

The integration of communities through transportation planning requires more emphasis when new road links are being designed and developed, as opposed to the more common occurrence of these structures bisecting and isolating sections of the established community. One of the basic principles of land use planning is that the transport network is to serve land use, not shape or dominate it. There has been a gradual shift in transportation planning in the developed world, with New Zealand local authorities and planning practitioners now beginning to adopt this stance also. A major problem in New Zealand has been that transportation planning and land use planning lack coordination, and consequently have been out of step and, at times, in conflict. The focus is increasingly on both land use and movement systems in order to best meet society's overall requirements with the resources available and while also displaying some regard for the social structure and environment of the affected area (British Department of the Environment 1972, Transit New Zealand Transport Symposium, 1991).

Residents and business owners can endure the suffering of psychological stress for significant periods of time. Evans comments that;

"psychological stressors may precede the physical event, last longer than the event and continue to evoke stress after it is past" (1982,18).

These aspects of stress also have particular relevance in the designation of roading projects, many of which in the New Zealand experience are yet to be realised in the actual construction of the road project. The psychological effects of these designations have enforced a condition of long term stress on the residents living under them. Elements of psychological stress may well continue for some residents, long after the designation has been removed, depending on each individual's perceptions of the situation and their ability to deal successfully with it.

Psychological stress is a particularly common form of stress, that is associated with mainly cognitive, emotional and motivational functions and conditions, as opposed to other types of stress such as biological. Cofer and Appley (cited in McGrath 1970,5) make the distinction between

"system stress which refers primarily to physiological and psychobiological

concerns, and psychological stress" .

Psychological stress exists when there is cognitive perception of threat through the organisms appraisal of the external environment and the subsequent interpretation of the information received. Lazarus notes that

"stress reactions appear to be the result of conditions that disrupt or endanger well established personal and social values of the people exposed to them" (1966, 4).

It is possible to assess psychological stress indirectly, by measuring a variety of other levels of response to the perception of threat. McGrath (1970) believes that assessment of bodily conditions and functions by physiological measures and the monitoring of behavioural or overt responses of the organism to environmental events or settings, may help to provide some insight into the cognitions and responses that result from the impact of stress on the individual.

In a roading context, Stanley and Rattray's observation of the residents' perceptions of the imposition of a roading structure allows some degree of understanding of their reaction to the forced disruption of their physical and social surroundings:

"An actual project is not merely a physical facility. It is introduced by specific organisations or political institutions. It is often seen as serving the interests of specific groups in society. It may be opposed or supported by other groups... These components are part of the relevant environment within which people assess the impact of a project on their lives and predict the extent of social disruption, including social severance" (cited in De Boer, 1986, 22).

This appraisal and interpretation of environmental events, and any subsequent resulting distress by the residents concerned, may be considered as *sunken psychological costs* in any cost benefit analysis of a roading project. The time and energy expended on the appraisal of, and subsequent effort required to cope with, the effects of the new roading development such as relocation and severance, are examples of psychological costs that are imposed on residents and represent some monetary and non-monetary costs to society as a whole. At present these very real psychological costs, such as stress, seem

to have been largely ignored in decision-making. The establishment of the exact size of these *sunken psychological costs* for roading projects in dollar terms, may never be possible due to the intangible nature of the costs involved. Bearing this in mind, this research will examine ways in which psychological costs may at least be mitigated.

The British Department of the Environment (1972) makes the recommendation that personal contact between the relevant officials and the residents affected by the development may assist in the overall understanding between parties. This would assist in reducing the amount of psychological stress suffered because of residents' unfounded fears as a result of a lack of explanation from the officials and a lack of comprehension on their behalf. The provision by the relevant authorities, generally, for public feedback and the form that this might take is another aspect of communication that appears to require some attention, along with the ready availability of information and assistance regarding relocation. Appleyard (cited in De Boer, 1986) notes that for many years highway plans were quietly developed behind the scenes with the announcement of plans occurring at the last minute, with very minor public involvement, even from those directly affected. This has shifted today according to Appleyard, with the diffusion of information and participation occurring early in the planning stages. Despite the increased public involvement in planning, the result on the officials' side of events has largely been one of defending their already established position. Appleyard observes that their;

"efforts are to stress the positive aspects of preferred schemes. In the anticipatory stage, impacts are subject to distortion, rumour and exaggeration. Controversy may bring out different opinions on impacts and increase the quality of impact prediction" (cited in De Boer, 1986,61).

There exists a real need to assess the opinions and general feelings of those affected by the development and not to be tied to the opinions expressed by a vocal minority, who may or may not be entirely representative of the population concerned.

Psychological stress is the result of an individual's cognitive appraisal of external circumstances. The subjective interpretation of each situation will vary dramatically across the population affected, both in the degree of threat being perceived and in the

methods employed to cope with it. Understanding the perceptions of residents and businesses affected by road works and aiming to alleviate as many of their concerns as practical through increasing communication between the parties concerned would appear to provide an easily obtainable means of reducing the sunken psychological costs involved in roading projects. Fine tuning of this approach to lessen the impact roading projects have on psychological stress is needed. The following research questions are proposed in order to test for factors that have the greatest impact in creating and increasing psychological stress levels in areas affected by road works. Once these major contributing factors are established, then it will be possible to target future policies to the specific reduction or compensation of the component psychological stress in roading projects.

2.7 RESEARCH FRAMEWORK

The aim of this thesis is twofold. The first objective is to attempt to measure the level of psychological stress suffered as a result of the imposition of roading designations and forced property purchases on both affected residents and business operators. The second objective is to identify ways of mitigating psychological stress in these situations. In order to achieve these objectives, a research framework has been developed from a review of relevant literature. This framework establishes the methodology to be used to measure psychological stress and poses several research questions designed to investigate its mitigation.

2.7.1 Measurement Of Psychological Stress

The first research objective is to examine whether it is possible to directly quantify the level of psychological stress suffered. It is currently recognised that psychological stress can be suffered by residents as the result of their property being acquired for roading. However, the extent of the prevalence of psychological stress and the degree to which property owners are affected is relatively unknown. Currently only a brief description of its presence is currently required in the Transfund New Zealand Project Evaluation

Manual. Chivers *et al* (1992) in their review of the Manual commented on the lack of quantitative methods to assess intangibles including psychological stress. It would appear that this problem is not unique to New Zealand, as a review of relevant literature indicates that no record of direct measurement of psychological stress has been undertaken in the context of roading developments, although a significant amount of measurements have been undertaken as part of clinical studies of stress.

Jensen (1989), in her unpublished thesis research, used a list of 30 Stressful Life Events to identify symptoms of stress and depression amongst her surveyed subjects. This list was adapted to the New Zealand context from the studies by Bell *et al.* (1982) and Holmes and Rahe (1967). The list of Stressful Life Events were listed down the page and interviewees were asked to indicate the number of life events that had affected them in the past 12 months. The listed Life Events from serious stress inducing incidents such as the death of a child or spouse through to more minor events such as an argument with a co-worker or taking a holiday. The number of events indicated by the respondents was then used to assess the relative level of psychological stress affecting people in different localities.

Jensen (1989) also combine the Stressful Life Events responses with a survey of stress symptoms using a Depression Inventory similar to that used by Bell *et al.* (1982). Interviewees were asked to indicate whether they had suffered from a series of stress symptoms and the frequency of this as indicated on an ordinal scale with associated responses of *often*, *sometimes*, *seldom*, and *never* (Kaplan 1983). Symptoms could be broadly categorised into four groups; affective symptoms related to lowered mood, a variety of somatic symptoms, altered patterns of psychobiological reactivity such as sleep and appetite, negative self evaluation and future outlook (Bell *et al.*, 1982). These results were then used to assess the need for the provision of psychological services and other assistance for “at risk” people in the community.

2.7.2 Mitigation Of Psychological Stress

The second major research objective relates to the investigation of mitigating factors that would reduce the impact of psychological stress. Having established that stress is being suffered by property owners, it is important to identify the main contributing factors, and to investigate whether these factors could be reduced or eliminated entirely in future roading developments. This section examines two main research questions, derived from relevant literature, that will be investigated through the survey of affected property owners. These two hypotheses relate to the communication processes employed by the roading authority to liaise with affected property owners and ways in which psychological stress can be reduced through these processes. In addition, a number of other possible influencing factors that will be considered as part of the analysis of the survey results from this thesis research. These factors and literature relating to these are also considered below.

Communication and Public Information

Attempts initially at mitigating the psychological stress suffered by residents, with the application of better communication and mediation techniques, form the basis of the two leading thesis research hypotheses. First, that more direct communication between the officials and the residents or business operators affected, would increase these persons' level of understanding of the project and decrease the amount of psychological stress suffered as a result of uncertainty. And second, it is hypothesised that residents and business operators who feel happy with the level of public information and participation involved in the project's planning, will suffer a lower level of stress than residents or business operators who feel they are not adequately informed on issues or that their opinions are not addressed.

Sullivan *et al.* (1996) examined communications in relation to citizens affected by the development of flood control measures on Hickory Creek, Illinois. An Environmental Impact Statement (EIS) had been prepared for the project with its aim to increase the understanding of people affected by the project. However, Sullivan *et al.* (1996) noted that at the public meeting on the development, no one had read the EIS as people considered it to be difficult to read and comprehend. This meant that affected people

were reliant on less accurate sources of information such as newspaper articles and the comments from various interest groups. Sullivan *et al.* (1996) considered that good communication strategies including the production of an understandable EIS and direct contact with the project's officials produced a better working relationship between the two parties. Citizen participation early in the process also allowed greater time to accommodate diverse views. In particular;

“Participation by informed citizens substantially reduces the number of appeals by giving the authority credibility and increasing public support for the project by resolving disputes early” (Sullivan *et al.*, 1996).

The issuing of official information and management of all communications relating to the roading project is important to ensure that those affected received accurate information on which to base their reactions and decisions. Steiner points out the dangers of:

“a newspaper story or preliminary door survey by officials which can engulf a neighbourhood very quickly in alarming rumours of impending demolition” (95,1978).

Elderly residents may be particularly susceptible to fears caused by unfounded rumours. Some elderly have little to do and are isolated from community leaders and may take more notice of rumours than other residents who are more in touch with community affairs. Affected property owners should be able to directly contact appropriate people in authority to clarify any queries that may arise. The issue of accessibility of the public to official information and the timing of this first contact is an important aspect of any roading project's communication strategy. It may not be convenient for officials to have to field public inquiries from the first day that a particular roading project is conceived but there may be significant benefits from this for affect property owners, and for the project as a whole. Steiner notes that:

“The time lag between public awareness of demolition plans and the presence in the neighbourhood of an official agency which can answer questions and correct misinformation creates ample opportunity for widespread panic” (96,1978).

It would appear that the early first official contact is made with affected people, the better. The importance of direct contact and ongoing provisions of official information will be examined in this research.

Other Factors to Consider

Communication and public information provision would appear to be important factors that may assist with the mitigation of psychological stress suffered by people affected by roading projects. However, other factors may also be significant and will also be considered in this research, these factors are examined below.

Familiarity with Authority Concerned

"The appraisal of stressors will depend on a number of factors including attitude toward the stressor, prior experience with it, knowledge of its consequences and evaluation of its apparent cost" (Evans, 1982,18).

Residents' and business operators' response to stressors will be dependent on the degree to which the event is perceived overall as threatening, harmful or challenging. The lack of knowledge or familiarity with official processes or the means of protesting official decisions can be incredibly frustrating for people directly impacted on by a proposed roading project. Frustration and the lack of control that a person perceives as a result of being "outside" the system can contribute to the level of psychological stress being suffered. It is worthwhile considering during the analysis of survey results whether residents who have prior knowledge of, or have experienced dealings with either the local authority or the roading authority will be less psychologically stressed than those who lack knowledge of, or experience with the stressors in this situation.

Stressor Control

The degree to which the stressor (the stress inducing agent) is perceived as controllable or not by the individual, has a significant effect on the overall appraisal and the resulting reactions to the stressor. The process of coping with stress is also important in decreasing the impact that psychological stress can have. Different types of coping strategies exist and can be deployed by different individuals at different times, with variations in their focus also, according to McGrath they may;

"take place before, during or after the occurrence of the stress inducing condition. Coping behaviour may be directed toward preventing or removing the stressor condition or toward preventing or undoing the consequences" (1970,24).

Initially, residents and business operators affected by roading proposals may react by directing their energies at averting the development or obtaining a transfer of the corridor to another alternative location. As the likelihood of the work changing location or being abandoned begins to decrease, these people's sense of control over their surrounding environment decreases and may contribute to increased psychological stress being suffered.

Psychological stress may increase as perceived control decreases. Residents and business operators who still perceive they have some control over the project's approval may be less stressed than those who perceive they have no control.

Project Uncertainty

Temporal and spatial factors also play a crucial role in stress appraisal, and residents' and business operators' ability to prepare for and cope generally with forced relocation. The consideration of event scheduling, in relation to the onset of stress in those affected, is necessary for future attempts at decreasing the impact that roading projects and designations have. The more unpredictable the nature of the source of stress and the less feasible control of it is perceived to be, the greater the impact it will have. Temporal uncertainty relating to delays in finalising the date for work commencement on the road project, as well as spatial uncertainty as to the exact location of the road within the corridor or lane provision details, can have an influence on the occurrence of psychological stress amongst the community's residents and business operators. The uncertainty of the specific details concerning the project make it difficult for members of the community to determine the exact effect that it will have on their own life or business. This may serve to delay and hinder the relocation preparation of the residents or businesses that are affected and may also cause unnecessary concern and worry for people who discover later that they are untouched by the project. In communities where the spatial and temporal details of the roading project have not yet been finalised,

greater stress may exist, than in areas where the roading details have been established and are known to the community.

Ability to Cope with Stress

These aspects of the perception of stress and coping with it, form the basis of the next few thesis research hypotheses. Lazarus in his concept of cognitive appraisal and psychological stress recognises that an;

"environmental demand can produce (psychological or perceived) stress only if the focal organism anticipates that he will not be able to cope with it or cope adequately or cope with it without endangering other goals" (cited in McGrath 1970, 17).

Consideration of residents and business operators ability to cope with, and/or undertake the preparations prior to the proposed roading development becoming a reality may indicate aspects which could assist with the reduction of psychological stress. Evans observes that;

"residents with a great wealth of resources for coping (eg. money, materials, family and friends' support) may be less likely to appraise events as threatening and as a result may be less affected by the stressor" (1982,26).

Communities may be adversely affected by the imposition of a roading designation and any subsequent development of blight in the area. In instances where the environmental condition of blight begins to affect a community with general disruption and the depletion of existing services facilities, those who lack the resources and possess no contingency plans to deal with the changes will suffer more from the effects of psychological stress. De Boer (1986) points out that lower socio-economic groups, those with young families and the elderly, will find it difficult to adapt since they lack the mobility to attend alternative facilities and services in other communities. Residents who possess the resources, both financial, physical and personal, to deal with the relocation of their place of residence may experience psychological stress to a lesser degree than residents who may not possess effective resources to cope with the move. It may be worthwhile considering the relationship between residents with low levels of mobility and coping resources as indicated by demographic and socio-economic features of low income, high dependent population (greater than average proportion of young

children or a large population aged over 65 years) and low private vehicle ownership rates, and the corresponding levels of psychological stress suffered during the period between designation notice and the commencement of construction.

The process of successfully coping with psychological stress in relation to relocation, may be largely influenced by the coping strategies employed and also by any pre-existing anticipatory considerations of the moving of one's residence or business premises that people may take on their own initiative. The planning for or consideration of relocation of one's residence or business premises prior to any roading designation notification may serve to reduce some of the stress impact that forced relocation can impose. The attitude of residents or business operators to the impending shift is also related to a large degree to the level of psychological stress suffered. Fried (cited in Duhl 1963) noted that residents with a negative outlook on the potential of their new relocation neighbourhood or home, were more anxious than those who had considered the idea of shifting prior to the forced acquisition of the property and relocation. Those residents who had planned to or had considered shifting from their home or neighbourhood of their own freewill prior to the designation, may suffer less psychological stress as a result of the designation than residents who had not planned or considered the possibility of shifting. Business operators who had considered shifting premises may also suffer less stress than those who have not previously considered it. Businesses whose client base is located in the immediate area are likely to suffer more than those businesses whose client base is wide spread and not dependent on location.

Acceptance of, and Planning for Relocation

Related to the aspect of prior consideration of relocation option is the way in which people cope once presented with the inevitability of the roading development's go-ahead and the subsequent occurrence of forced relocation. The acceptance of the reality of the situation and the fact that it is going to have a direct impact on the residents' lives and business operation, is a critical point in the process of coping, that those affected must reach in order to effectively deal with the consequences of the development on them and the ensuing psychological stress.

Psychological stress suffered by residents not only results from the actual physical adjustment of moving out of one's residence but can also stem from a combination of smaller contributing threats and adjustments that are associated with a move from familiar surroundings. Dohrenwend and Dohrenwend suggests these adjustments could involve such factors as;

"...establishing relationships with new neighbours, getting the house in order again, dealing with the possible financial demands resulting from the move and problems with the children's adjustment to new friends and schools" (1974, 91).

The existing attitudes people bring to a situation or event, such as the moving of ones' home, may have a marked influence on the subsequent success of relocation and the happiness of the residents in their new environment (Fried, cited in Duhl 1963). If there is acceptance or even optimism regarding the shift of residence then the new demands, changes in routine and adjustments will be better appreciated and dealt with effectively. When the shift is met with an amount of resistance then more psychological stress may be encountered as those affected are not mentally prepared for the series of routine adjustments or may simply not want to accept the change enforced on their lives. Once residents have accepted that relocation is unavoidable and cease their struggle against it, then they can begin to plan for the change in their residence, both physically and emotionally. The denial, of forced relocation in the future, by some residents can be detrimental and may result in increased suffering of stress given that there has been no forward planning or preparation for a change in residential locality. This would be expected to produce greater strain on residents when they are finally forced to move out of their dwelling and to complete this transition within a shortened time frame. Residents who have accepted and planned for relocation may experience less psychological stress than those residents or businesses who have delayed acceptance of the reality of the relocation and hence have not planned for a move from their present residence.

Anticipation of Threat

The nature of stress is such that psychologically induced stress may even occur in anticipation of physical events that never come to pass, due to the subjective, cognitive appraisal of threat (Evans, 1982; McGrath, 1970). This threat, as Evans points out;

"can involve actual or anticipated harms to the physical self, the psychological self and/or interpersonal relations. The threat may also be derived from conditions of the physical and/or social environment which deprive the individual of opportunities to satisfy physical, psychological and/or interpersonal needs" (1982,82).

These aspects of deprivation and the potential of harm to the physical and psychological self as well as to interpersonal relations, are all major features of psychological stress suffered particularly by residents under roading designations.

Cline, as cited in De Boer (1986), points out the severity of relocation on residents in stating that;

"disruption of the physical space has the potential of striking at the very foundation of the residents' sense of psychological wellbeing" (p 45).

The loss of one's home may be viewed as a direct threat to the physical self, in that the individuals' initial perception is that they are to be left without the most basic of provisions, shelter. This threat to the physical self may also be perceived as an attack on one's psychological wellbeing also, since the provision of shelter, along with food and clothing, make up the lowest level on Maslow's Needs Hierarchy. These basic needs must be satisfied before a person can advance to the higher levels in the hierarchy of safety, belongingness, self-esteem and self-actualization, and hence reach their full human potential (Myers, 1988).

The loss, seemingly, of all control over one's destiny due to forced relocation has dramatic direct psychological effects on some individuals. The irreversible disruption of interpersonal relations in the immediate neighbourhood may be the basis for many residents' feelings of anxiety and general stress. It may also be that the higher the level of attachment that residents have to their home and the surrounding social and physical

environment, the greater the feeling of attachment and belonging, and consequently the suffering of psychological stress may be greater.

The expectations of the residents affected relating to any new residential locality and home, based on their existing dwelling and neighbourhood that they have been forced from, is another important factor in determining the level of stress suffered. The design and adaptation of the individual home to suit the needs of those residing there, combined with the home's locality within a specific community, are aspects that are very difficult to recreate, yet are strong contributing factors to a resident's sense of security and identity (Steiner 1978). The resulting micro-environment is a unique adaptation to meet the needs and tastes of the dwellers. The abandonment of the familiar environment, in terms of the present home and the surrounding neighbourhood community, without any hope on the residents' part of being able to find a similar familiar environment, can have a major effect on the psychological stress already being suffered. Residents who believe they will not be able to find another home or neighbourhood equivalent or better than their present setting may suffer more stress than those with no or more positive anticipations.

Length of Residence

The aspect of length of residence is also related to the attachment that residents feel toward their home. Fried's study of relocation in the West End of Boston found that the greatest levels of psychological stress and grief were suffered by residents who had resided in their home or in the immediate area for most of their lives (cited in Duhl, 1963). The longer the period of residence, the greater the opportunities will have been to establish social ties, build a general sense of security and a knowledge of the surrounding community. Familiarity with ones' surroundings after residing in one's dwelling for a long period of time, accompanied by the physical work that usually goes in to obtaining an arrangement and standard of housing that suits the residents, may contribute to feelings of grief and stress when these housing conditions are removed because of an outside force (Fried, cited in Duhl 1963).

By examining the length of residence in a community affected by a roading development, an overview of the nature and stability of the social relations within the

community fabric may also be gained. The disruption and possible breaking of these social ties within the immediate community may contribute largely to the suffering of psychological stress among long term residents. The composition of the area is also important. A community which is relatively stable, characterised by long term residents and businesses, is more likely to be affected than communities with mobile population such as a large pool of short term tenants. As the period of residence increases, so too may the resulting level of psychological stress increase.

Area Affected

The purchase of property for roading projects involve acquiring varying quantities of land and proportions of individual sections. The relationship between the amount of land acquired from individual owners and the subsequent level of stress suffered by the affected residents is another impact area that requires further investigation.

Forced relocation appears to be, fairly obviously, the primary source of complaint from residents and business operators affected by roading developments. The effect on the lives of this group in the community is total and there is no course of action that they can, in all reality, take to prevent the inevitable outcome of compulsory acquisition. On the other hand, residents and business operators with partial land acquisitions as a result of the roading project, can be affected to varying degrees dependent on the relative location of the acquired land and the house or business premises. Residents or business owners whose partial property is to be acquired may suffer more psychological stress than those who have no claims on their property but in comparison may suffer less stress than residents and business operators whose entire property is to be acquired.

Blight

Unfortunately where designations have been imposed on a purely prospective basis and for an indefinite period prior to the construction of the roadway, a condition of planning blight has often resulted (Hearn 1987). Generally a number of factors combine to contribute to the formation of blight in the areas designated for future roading development, these factors are;

- i) the restriction on property rights which effectively limits the general maintenance and improvement of homes,

- ii) the sale of some properties to the authority concerned and the subsequent demolition of homes not required, often leaving bare and unkept section which can attract refuse disposal and abandoned vehicles,
- iii) or the letting of these dwellings to temporary transient dwellers who are unconcerned with the property's upkeep or appearance.

Fried commented, in his study of urban redevelopment in the West End of Boston, that the loss of property rights and the threat of forced acquisition of individuals' properties can produce psychological stress in some individuals as they become concerned and worried about their uncertain future (cited in Duhl, 1963). This is enhanced, especially if the neighbouring properties have been vacated and there are derelict empty sections sprinkled throughout the affected area. Blight and the general deterioration of the surrounding designated environment can add to the amount of psychological stress that is already being experienced. The development of psychological stress in residents affected by a designation was observed by Thomson *et al* and they commented that;

"some residents were worried to the point of illness about their loss of sense of security..." (1969, 139).

Yet, despite the evidence of non-user psychological stress resulting from the designation of areas for roading works, this is still a domain of transportation research that appears to have received very little attention in comparison with the more technical engineering aspects of road developments. The move to include the evaluation of all significant variables, tangible and intangible, in the balance sheet of all major roading projects has meant there is now an existing requirement to determine an objective method of assessing the subjective issue of psychological stress. In particular, it is the uncompensated distress and discomfort resulting from the placing of a designation or from compulsory purchase that needs to be considered in terms of intangible costs, since there is no "market" for psychological stress.

The aspect of uncertainty over the future of many planned road projects, as well as affecting residents' and businesses' long-term plans, can also have other environmental

effects on an entire community which may indirectly contribute to the suffering of psychological stress also. Speculation over the likelihood of a project proceeding or not can, in the mean time, contribute to the development of the condition of planning blight in the designated area and to the suffering of stress by all residents living there. Three main factors creating a condition of blight are apparent, these being;

- i) The removal of normal property rights by the imposition of the designation. This prevents any maintenance or upgrading work being carried out onto properties, other than the most vital repairs. The result of this is that the natural deterioration of the housing stock and business premises is accelerated, accompanied by the depreciation in value of the asset and a general decrease in the environmental quality of the affected neighbourhood (Hearn 1987).
- ii) The prospect of purchasing a long term investment, such as a home or business that has a roading designation over it, is not particularly appealing to the average buyer due to the limitation in property rights and the indefinite period of occupation left before the properties acquisition (British Dept of the Environment). Many homes once acquired, are rented to civil servants or through government agencies to less than desirable tenants.
- iii) As some of the required homes, businesses and institutions are acquired by the roading authority and cease normal functioning, accessibility to everyday facilities is hampered. People are forced to go elsewhere for shopping and other services. De Boer notes that;

"internal communication becomes worse and the process of gradual decline (depopulation and impoverishment of facilities) characterises these areas" (1986,11).

The disintegration of the neighbourhood as residents are forced to leave, decreases the amount of social contact, with activities becoming less organised at the community level.

The relationship between psychological stress and the differing amounts of physical resources that residents possess to deal with the conditions of blight, such as service deprivation will also be considered. The development of blight has an overall impact on the morale of the affected community also. The psychological stress of living in a deteriorating environment effects nearly all of the remaining residents.

As a result of the enactment of the Resource Management Act 1991, it is envisaged that the effects of planning blight will be reduced with the imposition of the *sunset* clause, limiting the period that a designation can be in place to five years before it is given effect (S.184). Previously a designation could be imposed in prospect without any definite date for the commencement of construction set, or without the authority having the capability or intention of purchasing the properties involved from their owners (Hearn 1987). With the introduction of the sunset clause, the effects of uncertainty as to the future of many roading projects will be limited to only five years, compared to the existence of designations, and uncertainty, for almost thirty years. Even so, in five years the effects of blight can still occur and bring a condition of psychological stress to those living in its midst. As conditions of blight increase so too the level of psychological stress suffered by residents, and business owners to a lesser degree, may increase.

Compensation and Assistance

The individual's ability to cope with psychological stress and the success of relocation both relate to the individual's resource base at hand which is being examined already. Generally where relocation is necessary due to roading developments, various compensation and solace entitlements exist as well as other financial assistance such as loans for those who may require them.

Individuals' sensitivity to and interpretation of potentially stressful events in the surrounding environment are subject to an extremely large degree of variation. No two individuals will perceive an event identically nor will the ensuing reaction by individuals be the same. Appleyard, as cited in De Boer, comments that;

"social and psychological impacts depend on which population is being affected. All people are not alike, some are more susceptible than others" (1986,55).

Appleyard also notes the importance of;

"searching out the people who are more intensely impacted, those who experience the more intense negative environmental impacts and social disruption for the longest duration and also to search for those most vulnerable to impact, that is those who are most sensitive and least able to cope" (cited in De Boer, 1986,55).

Individual residents and businesses affected by roading projects, all stem from vastly differing circumstances and hence have differing requirements that need to be met in order to ensure they are not disadvantaged due to the uninvited intrusion on their lives. This aspect of satisfying the individual needs of those affected, receives only minimal attention at present, especially when considering the major transformation of many residents' lives that occurs, due to forced relocation. By assessing separately elements of psychological stress on individuals affected by such projects, a more appropriate method of allocating assistance and targeting those most affected may be devised which should, ideally, lessen the overall social impacts.

Fried (cited in Duhl 1963) observed in his study of relocation that many people who required assistance in order to obtain a comparable standard of accommodation in a new locality, frequently did not receive any assistance through lack of knowledge or a refusal to accept what they perceived as charity. As a result, they were forced into a worse financial position as a consequence of relocation, through no fault of their own.

Steiner points out that there are instances of assistance being offered to people forced to move and cites the situation in Texas where:

"the state highway department must provide displaced persons with lists of relocation dwellings, information regarding security deposits, down payments and interest rates, maps of relocation areas showing where schools, parks, shopping areas and public transport routes are located" (92, 1978).

An examination of the residents' knowledge of their rightful entitlements and other forms of assistance that is available, is required in order to establish if residents are suffering needless stress due to a lack of information. Residents who have a greater

knowledge of their compensation entitlements and the nature of the assistance available to them, may suffer less stress than those residents who have less knowledge of the compensation and assistance available.

2.8 SUMMARY OF CHAPTER

Chapter Two initially established the organisational and legislative contexts for roading development in New Zealand and then discussed specific process relating to roading developments such as designations and project assessment and evaluation. Costs resulting from roading projects that are imposed on the community were considered as well as the current provisions that exist for compensation. The social impacts that roading projects can have on local communities were examined followed by a detailed discussion of the specific intangible of psychological stress.

The framework for this research was then established and outlined one possible method of psychological stress measurement that can be used, followed by a discussion of mitigation factors. Two main research hypotheses were developed for testing as well as a number of other minor factors that may also contribute to the mitigation of psychological stress resulting from roading projects. Chapter Three outlines the methodology used to measure psychological stress resulting from roading projects in New Zealand and to test the hypotheses relating to its mitigation.

CHAPTER THREE

EVALUATING PSYCHOLOGICAL STRESS

3.1 RESEARCH OBJECTIVES AND HYPOTHESES

This thesis has two main research objectives. The first objective is to attempt to measure the level of psychological stress suffered as a result of the imposition of roading designations and forced property purchases on affected residents and business operators. The second research objective is to identify ways of mitigating psychological stress affecting property owners during roading development.

To assist with the achievement of these objectives, more detailed research questions have been formulated based on the principles gleaned from the review from relevant literary sources and these will form the basic research hypotheses for this thesis. These hypotheses will be tested within a number of different case studies situations, in order to ascertain the factors that contribute greatest to the suffering of psychological stress amongst residents and businesses affected by roading developments. The research hypotheses that will be the focus of this thesis are stated as follows:

1. More direct communication between the officials and the residents affected would increase the residents' level of understanding of the project and decrease the amount of psychological stress suffered as a result of uncertainty.
2. Residents who feel happy with the level of public information and participation involved in the project's planning will suffer a lower level of stress than residents who feel they are not adequately informed on issues or that their opinions are not listened to or responded to. Residents who have a greater knowledge of their compensation entitlements and the nature of the assistance available to them, may suffer less stress than those residents who have less knowledge of the compensation and assistance available.

These hypotheses form the basis of the survey questions which are designed to evaluate the relative importance of these two factors on the incidence of psychological stress.

3.2 OTHER RELEVANT FACTORS TO BE CONSIDERED

The survey of residents and business operators will also attempt to identify other factors that may contribute to the suffering of stress. Survey results will also be discussed in the context of the following statements drawn from literature reviewed previously in Chapter Two. These findings, to be tested in this research, may identify other minor factors that could impact on the suffering of psychological stress.

- Residents who have prior knowledge of, or have experienced dealings with either the local authority or the roading authority, may be less psychologically stressed than those who lack knowledge or experience with the stressor in this situation
- Psychological stress may increase as perceived control decreases.
- In communities where the spatial and temporal details of the roading project have not yet been finalised, greater stress may exist than in areas where the roading details have been established and are known to the community.
- Residents who possess the resources, both financial, physical and personal, to deal with the relocation of their place of residence may experience psychological stress to a lesser degree than residents who may not possess effective resources to cope with the move.
- Residents who had planned to or had considered shifting from their home or neighbourhood of their own freewill, prior to the designation, may suffer less psychological stress as a result of the designation than residents who had not planned or considered the possibility of shifting.

- Residents who have accepted and planned for the relocation may experience less psychological stress than those residents who have delayed acceptance of the reality of the relocation and hence have not planned for a move from their present residence.
- Residents who believe that they will not be able to find another home or neighbourhood equivalent or better than their present setting may suffer more stress than those with none or more positive anticipations.
- The level of attachment that residents have to their home and the surrounding social and physical environment, the more feelings of attachment and belonging, the greater the suffering of psychological stress may be.
- As the period of residence increases, so too may the level of psychological stress tend to increase.
- Residents whose partial property is to be acquired may suffer more psychological stress than residents who have no claims on their property but suffer less stress than residents whose entire property is to be acquired.
- As conditions of blight increase, so too may the level of psychological stress amongst residents.

A survey was considered the most appropriate method to directly assess the experiences of affected property owners. Generally, psychology studies use direct subject reporting to ascertain the extent of a condition and identify influencing factors. Psychological stress is very much influenced by the circumstances and characteristics of the affected individuals. The individual's perception of stress and its causes could be considered the only reliable indicator of its impact. Consequently, the measurement of stress can only be gauged by the self reporting of stress symptoms and cause through an interview or questionnaire or by constant third party observation. It was considered important that a method be used that involved individuals directly reporting any symptoms of psychological stress or factors perceived as contributing to its suffering.

In general, the views of affected property owners are given little consideration in roading project evaluations and developments. This research provides an opportunity to directly measure specific effect of psychological stress on these people, as they perceive its impact.

The aim of the survey will be to:

- (i) establish if psychological stress is being experienced by individuals within each case study area and attempt to gauge the level of this;
- (ii) investigate the two main factors contributing to psychological stress and to consider the effects of other factors also; and
- (iii) ascertain ways in which stress causing factors can be alleviated in future projects.

3.3 CASE STUDY AREAS

Four case studies were selected to provide the context to test the incidence and causes of psychological stress resulting from roading developments in New Zealand. The study sites were:

1. St Albans Section of the proposed Northern Arterial, Christchurch
2. Yaldhurst Road Widening, Christchurch
3. St Aubyn Street Widening, Hastings
4. Pakowhai to Omahu Road Section of the proposed Napier - Hastings Motorway, Hastings

These case studies were selected in order to study stress across a range of roading projects of differing scales and location characteristics. The selection of four studies was considered an appropriate number given the time required to research the background of each roading project, to communicate with the key people involved in its

development, and to administer surveys on a face to face basis without compromising the quality of collection of data.

Two of the case study areas were the proposed corridor of new motorways routes, whilst the other two areas feature existing roads that are undergoing widening and intersection realignment. Study sites were selected in Christchurch and Hastings/ Napier (refer to Map 1), reflecting the researcher's familiarity with the areas and their proposed road works and for ease of travel for research and data collection. Areas were sought where roading projects impacted on a considerable number of residences and the suffering of psychological stress appeared likely.

At the time this research was undertaken, construction had commenced on the two study sites where road widening was occurring. The construction of the two motorway projects had been delayed because their economic evaluations did not meet Transit New Zealand's funding criteria. However, it appeared likely that the section of Napier to Hastings Motorway would commence construction within the next five years. In contrast, the future of Christchurch's proposed Northern Arterial was being reviewed with the project unlikely to meet Transit New Zealand's funding criteria for many years to come. As already discussed, under the Resource Management Act, designations for future roading developments can not be imposed indefinitely and have a sunset clause if no progress has been made within five years.

The study areas included a mixture of urban and rural roading projects. It was also considered important to include projects where residential properties and business premises were affected by the roading development. Often where land is required for a roading project, only part of individual properties may be affected. The acquisition of the front of sections adjoining a road which is to be widened is relatively common. In other cases the entire property may need to be acquired in order to carry out the work required. Study sites were selected that affected both partial and total properties. The length of the time the designations have been imposed on each of the roads or proposed roads varied dramatically also and was another important consideration in the selection of study sites.



The study site selection process used in this research did not specifically aim to include a range of areas with differing socio-economic status. However, there does appear to be significant variation in the socio-economic levels of the residents affected by the roading both within and across the selected sites. This variation in socio-economic status provides greater insight into the effects of psychological stress across the wide range of affected people with differing resources to rely on to cope with the impact.

The philosophies, policies and procedures employed by the roading authorities responsible for designation of land, the acquisition of properties and road construction varied across the case studies. These different approaches by the authorities provide another variable which can be investigated in relation to the incidence of psychological stress.

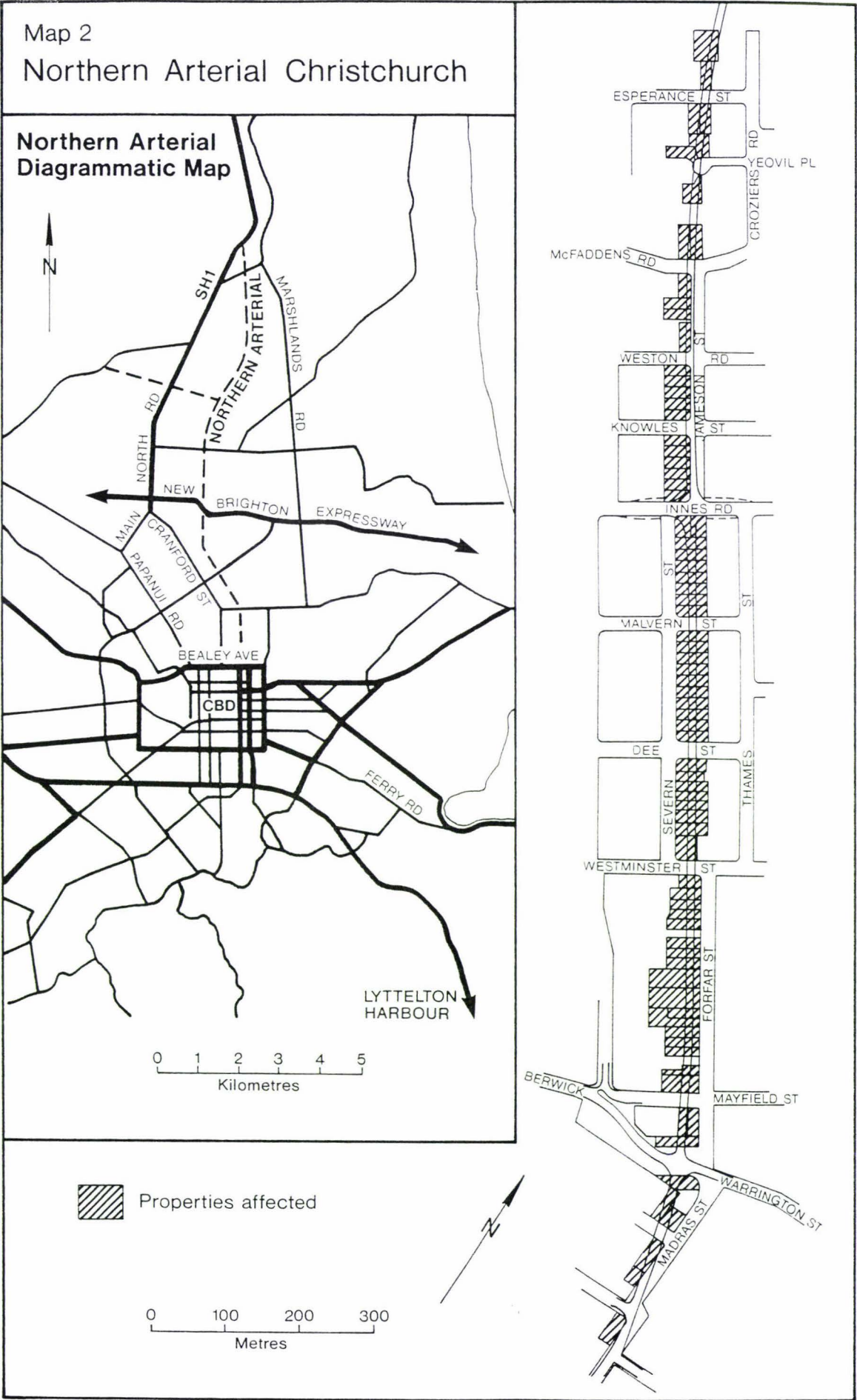
Each case study site is discussed in detail below. An outline of the background and nature of the road works affecting the area is provided, accompanied by a brief examination of the effects the project will have on the adjacent environment.

3.3.1 St Albans Section of the Northern Arterial, Christchurch

The first study site is the St Albans Section of Christchurch's proposed Motorway, the Northern Arterial. This project has over thirty years of history behind it and was conceived as part of the recommendations of the 1962 Christchurch Master Transportation Plan developed by the Canterbury Regional Planning Authority. This Plan was a twenty to thirty year vision of the roading needs of Christchurch based on traffic studies conducted in the late 1950's and early 1960's. It was based on the development of two major motorways, the Southern and Northern Arterials, supplemented by a series of connecting expressways.

The Northern Arterial was intended to link State Highway 1, north of Christchurch, through rural land and northern suburbs to the central city (refer to Map 2). Here it would then join with the one-way parallel pair of Barbados and Madras Streets through the central business district to eventually meet with the Brougham Street expressway to

(Source: Based on Christchurch City Council, 1988)



form a high speed link to the Port of Lyttelton. The determination of the exact motorway and expressway routes was undertaken by the Canterbury Regional Planning Authority, without any public consultation.

The St Albans section of the proposed Northern Arterial has caused the greatest controversy as this established residential area, between Winters Road and the Northcote-New Brighton Expressway through to Bealey Avenue, was to be transected by the motorway. Originally six route options existed for this section, the subsequent selection of route "E6" through the middle of the established residential suburb of St Albans was again made without any public consultation. In 1966 this urban stretch of the Arterial was estimated to cost £2.36 million with an additional £700 000 to span the section of the route from Purchas St and Bealey Ave. The motorway was to be constructed at ground level and was to include a number of underground accesses to be provided at various points where the motorway dissected established community social paths and school routes. The actual motorway corridor required a large area and was originally to consist of two carriageways with three to four lanes, 10ft shoulders and a 44ft median strip to separate the traffic flows. Construction of the project was planned to commence on the rural section by 1972 and was to be built moving inwards, towards the city centre (*The Press*, 2 November 1966).

Details of the route selection were made public in *The Press* newspaper in 1966, before the affected residents had been notified. At the time there was criticism that the scheme had been made public too early, especially since the St Albans section was not planned to be under construction until around 1976-80 and the Ministry of Works were not prepared to purchase properties until 2-3 years prior to construction. The Ministry of Works, at this time, was responsible for the construction of all substantial roading projects.

The publishing of the proposed scheme prior to residents receiving notification of the requirements of the designation in relation to their properties, generated a considerable amount of ill feeling at the outset of the project. The District Commissioner of Works pointed out that;

"if the publication of the corridor had been notification of a district scheme², property-owners would have had the right of appeal. In this case they had no right of objection or appeal because it was part of the City Council's undisclosed district scheme" (*The Press*, 2 November 1966).

In 1967, the year following the media's release of the plans, designation orders were sent to the 366 property owners who were affected by the E6 route corridor. The designation meant that no major improvements, alterations or even repairs could be undertaken on the properties. Baker, in his evidence to the Planning Tribunal, pointed out that;

"a designation limits the allowed uses and development of the property, and makes people make different decisions about developing and maintaining their property than they would otherwise make. From the national economic viewpoint the designation may thus cause wasteful use of the property until the property is actually developed" (C11/88 p2 of evidence).

The affected property owners were given no indication when their land would be required by the Ministry of Works which created a climate of uncertainty. Some residents panicked at this stage and sold their homes cheaply to escape the uncertain future and the Ministry of Works received its first applications to purchase properties under hardship grounds. The physical effects of the designation on the suburb of St Albans did not take long to emerge. In 1969 the President of the Canterbury Westland branch of the Real Estate Institution commented in his annual report that;

"Many owners of properties situated on the city's proposed motorways have 'lost heart' in the maintenance of their homes because of the uncertain promises and dates of the motorway programmes..." and

"The position was causing frustrating and worry to property owners, and the value of the properties had declined considerably." (*The Press*, 20 May 1969)

During the following ten years no construction commenced and the Christchurch City Council swayed back and forth on its support for the Arterial. In 1974, following with the oil crisis, some restraint on roading expenditure was demanded. Consequently

² District Schemes and City Schemes were the statutory planning documents required under the Town and Country Planning Act 1977. In 1991, with the introduction of the Resource Management Act, these were replaced by District Plans as the statutory planning documents for territorial authorities.

residents were allowed to carry out improvements and additions since the land was not required for at least another 15-20 years.

In 1975, the region's Second Transport Study was conducted with alternatives investigated for the St Albans section of the Northern Arterial. The most significant feature was the reduction of the initially proposed a six to eight lane carriageway to just two two-lane carriageways in 1977, following the Study and the subsequent Review of the City Plan. In 1979, the designation was removed from the 140 properties which were now surplus to the land requirements for the reduced lane Arterial. Over half of the 206 properties still required had been purchased by the Ministry of Works and the Christchurch City Council.

The downgrading of the Arterial to a narrower roadway acknowledged that predicted traffic flows for the project based on late 1950's data were well outside the actual data in 1977. The need for the motorway system had also been based on the population growth figures indicated in Table 1. It was assumed that, on the population reaching 400,000, the Northern Arterial would need to be operational. In comparison, Christchurch's 1991 population was only in the vicinity of 300,000, well below the projected population figures.

Table 1 Christchurch Population Projections

Population	Year Population predicted to be reached
300 000	1975
330 000	1980
360 000	1985
400 000	post 1990

(Source: Canterbury Regional Planning Authority 1978a)

During the 1980's, there were several Planning Tribunal hearings and a High Court hearing, in which objections to the designation on the one-way central city parallel pairs and the Northern Arterial were made. The hearings related to their adoption within the district planning schemes of the Waimairi County and the Christchurch City Councils.

The channelling of unnecessary traffic through the inner city and the encouragement of private vehicle use by the provision of a facility such as the Northern Arterial, as opposed to public transport, conflicted with other goals and objectives of the City Council's district scheme. The severance of neighbourhoods by the proposed route also presented contradictions within the City scheme.

In 1984 the Transportation Study Working Group (TWSG) was set up to study the feasibility of the proposal and consequently produced six volumes of findings but lacked any firm recommendations regarding the future of the motorway. No public representatives were involved on the working group who published their report just prior to the date of the Planning Tribunal hearing. This forced an adjournment of the hearing so the St Albans Residents' Association were able to examine the report and prepare a case on it.

The reasons for supporting the Northern Arterial route in the 1980's had shifted from the original city and port link concepts and were now focusing on the curtailment of "rat runners" on minor roads that ran parallel with the main northern accesses of Papanui Road and Cranford Street. Traffic on both of these roads had increased considerably and there was some pressure from those living adjacent to these two roads to provide the safer, quicker alternative route of the Northern Arterial. At this stage around 65% of the properties required had been purchased by the authorities.

In March 1988, the Court of Appeal finally upheld the Minister of Works' requirement that the designation for the Northern Arterial contained in the district schemes remain in place. In 1989, the Transit New Zealand Act took effect with the establishment of the funding and road management authority, Transit New Zealand, and the transfer of the responsibility for designations to the Minister of Transport. Transit New Zealand, once it assumed responsibility for roading projects from the National Roads Board, investigated their viability. Transit New Zealand estimated that if construction of the Northern Arterial project commenced that year, its cost would now be in excess of \$50 million. By August 1990, Transit New Zealand considered the project as uneconomic and expensive. Consequently they requested the Minister of Transport to uplift the designation.

Early in 1991, the Christchurch City Council formulated a proposal to share funding for the project with Transit New Zealand which the latter rejected and again recommended to the Minister that the designation be lifted on most of the route, excluding the rural section and properties surrounding the main intersections. In March 1994 Transit New Zealand opted completely out of the project but gave the City Council the option of buying the land already purchased by the authority for the market value, around \$11 million and imposing their own new designation. The Christchurch City Council decided against imposing their own designation and instead commenced investigations into city access from the north and aimed to include these provisions in the new district plan. On 1 June 1994 the northern arterial designation on the area between Bealey Avenue and the Northcote - Brighton expressway was finally uplifted, twenty years after the uplifting had originally been mooted. Still remaining is the rural section of the northern arterial corridor between the Northcote - Brighton expressway and Chaney's which is viewed potentially as a future bypass for Redwood and Belfast.

With the removal of the designation, the large amount of property that had already been purchased for the project would now be surplus to requirements. Transit New Zealand's Regional Manager in Christchurch, Robin Odams, pointed out in the "In Transit" newsletter that;

"By law, this land is subject to Section 40 of the Public Works Act which means in certain circumstances the previous owner is given the opportunity to buy back the property. If the previous owner does not exercise that right, Ngai Tahu have the option to purchase as part of the Ngai Tahu Maori Land Claim. If still available, property will be offered on the open market or disposed of in accordance with policies agreed at that time" (p2, 1994).

The long history of the Northern Arterial is particularly important in providing the context for the suffering of psychological stress by residents for a sustained period of time. The uncertainty associated with the project's future construction has been a factor of daily life for those who remain in the area and this has continued for a substantial portion of these persons' lives. It has dramatically affected those residents who chose to remain in their home despite the continuing stress and the degradation and blight occurring in parts of the surrounding neighbourhood.

3.3.2 Yaldhurst Road, Christchurch

The second study site selected was a section of Yaldhurst Road in Christchurch that was widened from two lanes to four lanes. Yaldhurst Road is a major arterial extending west out of Christchurch and eventually merges into the State Highway 73, which is the main access to the West Coast, on the rural outskirts of the city (refer to Map 3).

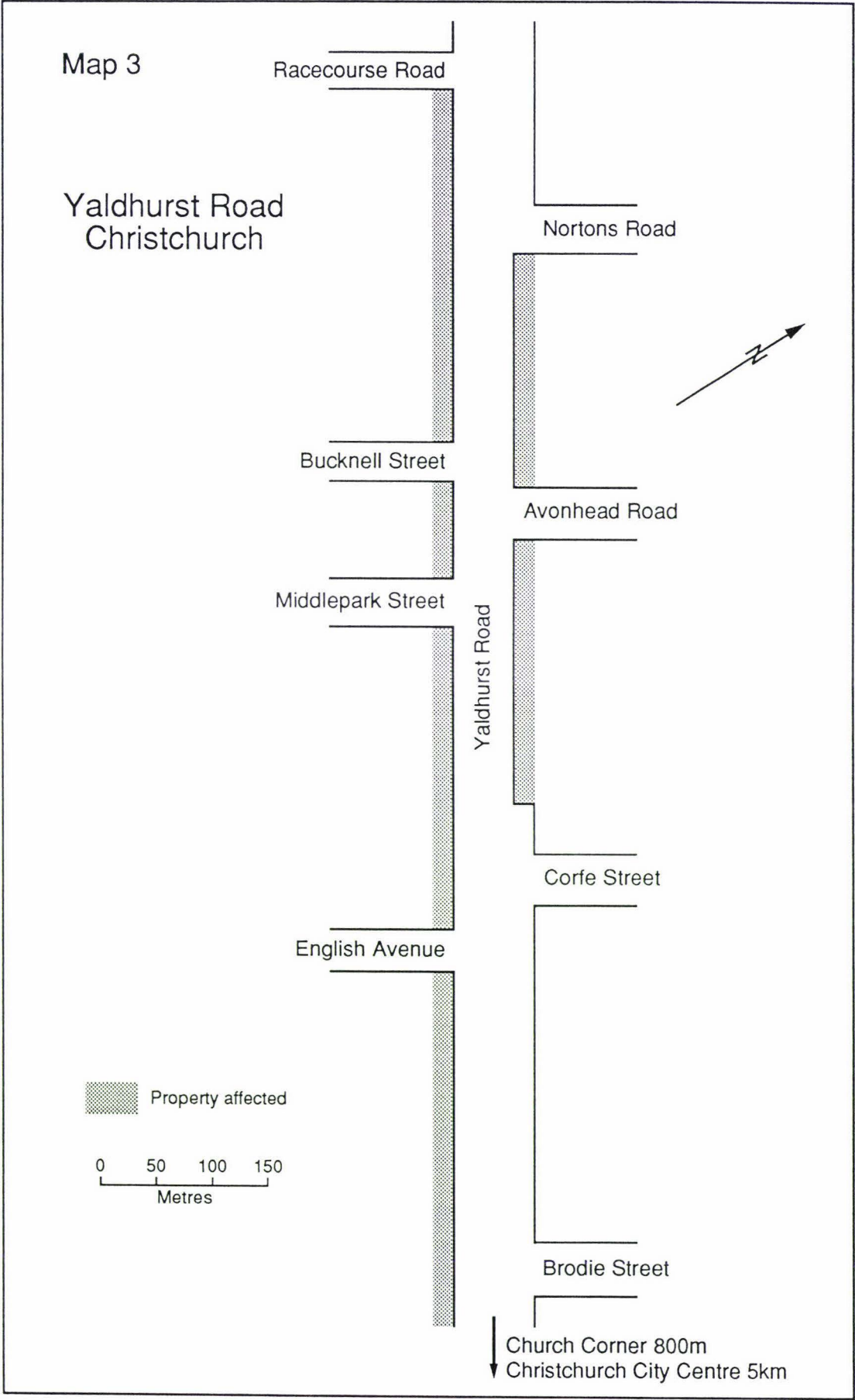
The urban length of Yaldhurst Road consists of several differing widths of carriageway which to quote Martin Oppenhuis, from correspondence received from Transit New Zealand's Christchurch office (1993);

"can be confusing to motorists and certainly leads to undisciplined driver behaviour and accidents."

Where the roadway was wider than the usual width allowed for a two lane road, drivers were observed to by overtaking, often illegally on the inside of the traffic flow. These manoeuvres sometimes resulted in accidents when other vehicles turned into Yaldhurst Road and into the path of these overtaking vehicles. A uniform width of road is desirable both from a safety and maintenance point of view.

Before widening commenced, the two lane section of road from Church Corner to Coach Corner carried a traffic volume of approximately 19,000 annual average vehicles per day (AADT) and the annual traffic growth rate was around 8-10%, as the result of substantial new residential developments in the west of the Christchurch (Transit New Zealand 1993). In accordance with Transit Zealand policy, upgrading to four lanes is considered when the AADT reaches 12,000 and is funded once the cost benefit ratio of the project exceeds 5.

The widening to four lanes with a median strip was undertaken on a section of road about one kilometre in length and commenced near the start of Yaldhurst Road about 300m past the Church Corner intersection. Widening occurred on both sides of the present roadway, with 20 out of the total of 37 properties affected on the southern side



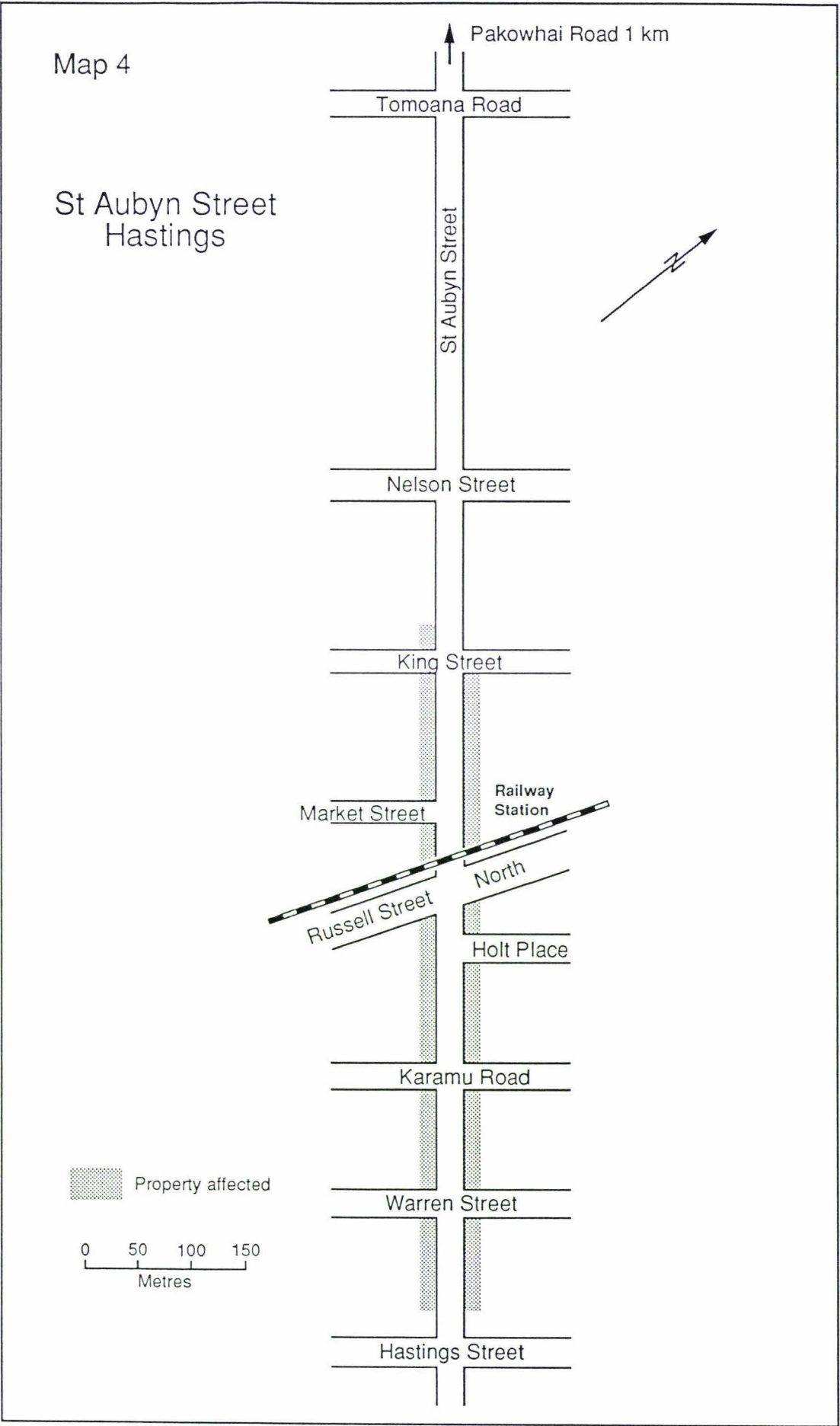
of the road. Several existing intersections were also realigned as part of this project, hence properties on the corner sections have experienced the greatest loss of land. Traffic signals were installed at the T-intersection with Avonhead and Middlepark Roads in order to provide easier vehicle movement and increased safety for both vehicles, cyclists and pedestrians.

The future need for wider carriageway along Yaldhurst Road had been anticipated as early as the late 1960's and 1970's and as subsequent sections bordering the road came up for subdivision, provisions were made by the Paparua County Council to acquire areas of land fronting the road, prior to property development. Hence, not all properties within the 1km section that has been widened were affected by land acquisition. One property required total acquisition and another business premise required demolition although replacement premises have been built within the new property boundary. All the other land acquisitions affected residential and business property frontages including fenced, gardened and lawned areas.

Construction on this project had commenced whilst this research was being conducted. Yaldhurst Road is now four laned with construction work fully completed and its use fully operational.

3.3.3 St. Aubyn Street, Hastings

The third case studies was the widening of St Aubyn Street in Hastings. This project was part of a Hastings City Council transport plan to establish an outer ring road or traffic box and an inner city parking loop to replace the existing ring road around the Hastings central business district. The project work focussed on a 900m stretch along St Aubyn from the Hastings Street intersection to just beyond the Nelson Street Intersection (refer to Map 4). Mainly commercial properties were affected, although two residential properties were totally acquired and another property covering two section lost a significant area of property frontage.



The road widening was designated in 1990 prior to Transit New Zealand funding for the project being approved. This meant that the actual timetabling of any construction work was beyond the control of the Hastings City Council and created a large degree of uncertainty. In this climate of uncertainty, initial acquisition negotiations commenced by Hastings City Council staff, directly with the property owners concerned. Unfortunately in a number of cases, negotiations stalemated due to the personalities involved, the intransigent views of some property owners affected and the contentious nature of the whole situation. As a result of this lack of progress, distinct polarised attitudes began to develop between the parties concerned.

At this stage, an independent purchasing agent from Works Consultancy was called in to finalise the remaining outstanding property deals and establish as far as possible a "win-win" outcome so the project work could proceed upon the availability of central government funding. The negotiated agreements proposed by the Works Consultancy purchasing agent were accepted by the Hastings District Council.

Construction work on this project had commenced on land that had already been purchased at the time of surveying affected property owners. The project is now complete and this section of St Aubyn Street is fully operational as a four lane road.

3.3.4 Napier-Hastings Motorway

The concept of a Napier-Hastings Motorway originated from a 1960 Cabinet decision on the siting of the Hawkes Bay Airport. When the Westshore site was chosen over the Bridge Pa site, the promise was made to provide a high standard limited access "Motorway" from the Airport to Hastings. In 1964 with the basic location and form of the motorway decided, a middle-line proclamation was gazetted covering the Taradale Road to Allen Road section and the motorway was then designated in the Napier City District Scheme.

The designation of the remaining section from Allen Road intersection with Pakowhai Road through to Omaha Road and York Road was not quite so simple (refer to Map 5). In 1964 the Minister of Works successfully appealed, through the Town and Country Planning Appeal Board³, against the Hawkes Bay County Council and a group of affected land owners regarding the inclusion of provision for the motorway in the Council's District Scheme. The main concerns focused on the loss of over 100 acres of very high quality agricultural land as a result of the motorway's construction and the existence of alternatives including the upgrading of State Highway 2.

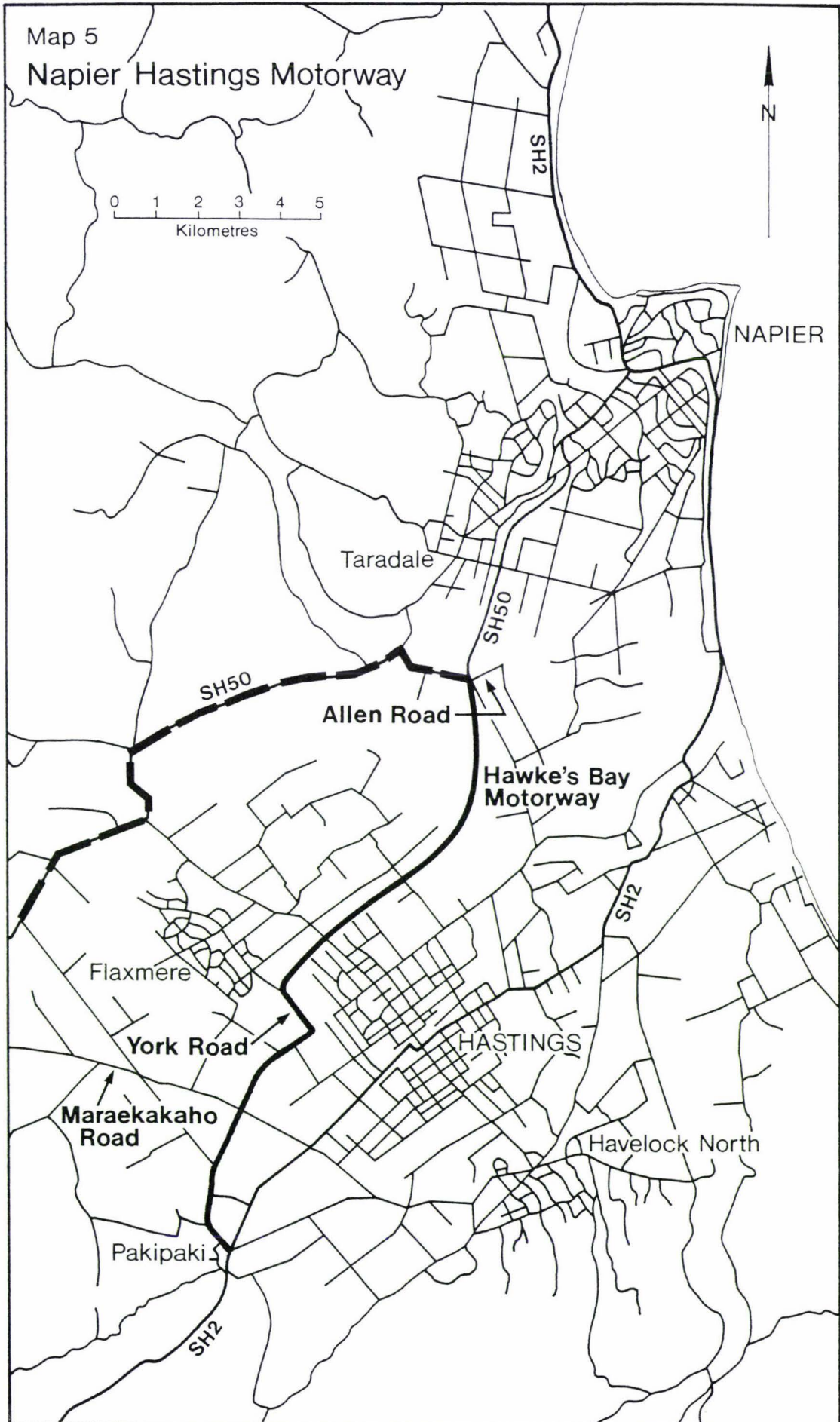
The Chairman of the Appeal Board, Mr J Kealy observed that;

"that the proposal for the construction of the motorway had aroused strong feelings in the district affected - both pro and con." (315/62)

As a result of the appeal decision, the remaining lengths of the motorway were designated in the Hawkes Bay and Hastings District Schemes in 1970. The first section of motorway, a two lane arterial from Meeanee Road to Pakowhai Road was completed in 1970. The Meeanee Road to Kennedy Road section was completed in 1973, followed by the final link through to Taradale Road which opened in 1975. The urban sections around Taradale, which the motorway dissected, were designated prior to residential development and hence created little disruption to the surrounding environment.

During this period of construction from 1969, the Heretaunga Plains Transportation Study was undertaken. An interim report adopted by all contributing authorities, including the Napier and Hastings City Councils and the Ministry of Works, recommended that a network with a limited Motorway extension across the Ngaruroro River as the major road be the basis for further investigation and analysis for the final Heretaunga Plains Transport Study report (HERTS). It also recommended that the Motorway proposal be recognised as the strategy for the future roading programme and that planning protection be retained over the entire length.

³ The Town and Country Planning Appeal Board had jurisdiction over statutory planning requirements. The board was later replaced by the Planning Tribunal and more recently, in 1996, by the Environment Court.



(Source: Based on Hastings City Council *et al.*, 1986, 9)

The final report was produced in 1980 and re-affirmed that the motorway was an essential element in a transport system to serve the existing urban areas and rural activities on the Heretaunga Plains. Network improvements were divided into priority groups with group 1 including all those required immediately to alleviate existing deficiencies. At the top of the Priority group 2 was the motorway alignment from Pakowhai to Omahu Roads as well as other network links that would be required in the near future. The 1986 HERTS Review based on the National Road Board's economic analysis of projects, confirmed the motorway as the basis of the Transportation network. The construction of the Pakowhai - Omahu Road section was confirmed as the first priority once traffic volume thresholds were reached.

3.4 METHOD OF EVALUATION

The conduct of Questionnaire-based interviews with affected property owners was selected as the best means of answering the research questions that had been posed. Currently the assessment of psychological stress in roading project evaluations is undertaken independently of any discussions with those affected. In order to advance the evaluation of stress and identify ways to reduce its impact, it was considered crucial to take into account the concerns, opinions and perceptions of those directly affected.

A questionnaire was used to ensure that all interviewees were responding to basically the same questions and this helped to focus answers accordingly. This method of approach was also chosen as a means of speeding up the information collection and analysis process.

A total of 44 resident and business operators spread across four different roading projects were interviewed using a series of slightly adjusted questionnaires. The number of people interviewed in each study area varied as a consequence of the project scale and numbers of properties affected. No subject control group was included in the research as emphasis was placed on gaining quality information from as many people directly affected by a roading designation as possible.

3.4.1 Affected Property Owners

The principle used to determine selection of survey respondents was that all owners of properties directly affected by a designation would be interviewed. However, during the period that interviewing took place, some owners were unavailable or contact with them was not able to be made. Tenanted properties were not included as the owners were not considered to be directly affected by stress in these circumstances. When the tenants were approached for inclusion in the study, all commented that they knew the status of the property when lease agreements were drawn up and consequently did not consider it to be a problem.

The majority of interviewees were affected by the two road widening projects, with 13 people affected by the St Aubyn Street widening and 17 people affected by the widening of Yaldhurst Road. Ten of the interviewees were affected by the section of proposed motorway from Napier to Hastings between Omaha Road and Pakowhai. The remaining four interviewees were affected by the proposed Northern Arterial in St Albans, Christchurch.

The lower number of respondents from the Napier-Hastings Motorway site is explained by the fact that few properties were affected by the project but all were rural holdings of reasonably large property size. All but one of the original owners of property affected by the proposed motorway were interviewed, despite the fact that the designation was imposed many years previously. In contrast, urban property owners appear to be significantly more transient in regard to their housing. Only four original owners of properties affected by the Northern Arterial designation could be contacted for inclusion in this research. Attempts to track down former owners were made with the assistance of the St Albans Residents Association membership lists and from statements from affected residents presented at the 1987 Planning Tribunal Hearing.

The long history of the Northern Arterial project, and length of time that has passed since the designation was first imposed, made it extremely difficult to locate and contact the original owners of affected properties. Only one owner, from the four interviewed, still resided along the proposed motorway alignment. The other three affected property

owners had shifted, as had the majority of other original owners. While another significant number of affected owners had subsequently died.

The following table illustrates the spread of interviewees across the four roading projects as well as the classification of these people by the amount of property acquired/affected and their nature of the ownership. Property owners who are identified as “Business” include rural property owners who operate as a farm or orchard as well as a residential dwelling on the affected land. All of the subjects affected by the proposed Napier- Hastings have been categorised on this basis.

Table 2 Number of Interviewees By Study Site and Amount Property Acquired

Type of Properties Affected	Business		Residential	
	partial	total	partial	total
Northern Arterial	-	-	-	4
Yaldhurst Road	2	1	14	
St Aubyn Street	11	-	1	1
Napier - Hastings Motorway	10	-	-	-

3.4.2 Questionnaire Design

Interview questionnaires, administered to affected residential property owners, were divided into two parts while business owners completed a one part questionnaire. This difference reflected the relative differences in the experience of psychological stress by these two groups. People, whose residential property was affected by a roading development, were considered to be potentially more at risk of suffering from stress than affected business owners. The rationale for this was that business operators are only directly affected by the road project during the hours of their work. They can escape the direct impact the roading development may have when they return to their residences each evening. In contrast, many residents are forced to live with the roading development and its effects up to 24 hours a day. In order to test the magnitude of psychological stress, an additional section of the interview questionnaire was added for

residential owners. The section was designed to assess the subject's experience of stress symptoms and level of stress resulting from the roading project relative to other pressures in their lives.

The questionnaires administered to affected business owners and residents contained common questions relating to the interviewee's experience of communications with the roading authority but also differ on questions where details of the direct impact of the roading development on them were sought. Generally, questions focused on the type and amount information and contact that interviewees had had regarding the acquisition of property and the project overall, the degree to which they were affected and their satisfaction with the outcome and/or process. A question also asked interviewees to put forward any suggestions that they had for improving the process that they had experienced. Details of the actual impact of the roading development were then sought, such as the area of land affected.

Because of the different nature of the projects, the range of people affected, and the differing time scales, a series of targeted questionnaires were used that had been tailored to fit the circumstances of the particular project and type of property affected. Obviously if someone had been forced to relocate their residence, then questionnaire details differed from another situation where a business operator was losing part of their property. Since the purpose was to identify factors that cause or added to stress and ways in which this could be reduced, it was important to ask appropriate questions which reflected individual circumstances.

Interview questions generally required a response to be given within a five point ordinal scale or range, as well as allowing some space for the recording of any additional comments from the interviewee. In the majority of questions, the level of satisfaction that the interviewee had with a particular factor discussed in the question was indicated on a scale between zero and four. Four was classed as high and zero was regarded as low. The use of a range or scale to classify responses, was designed to make questionnaire completion easier for interviewees than unstructured free answers would be. It also permitted an assessment of the intensity of interviewee's responses to particular questions.

3.4.3 Life Events / Changes

People whose residence was affected by the designation and were still residing at the property or had shifted within the past 12 months were asked to complete another questionnaire section based on the Holmes - Rahe scale of life changes/ events and ratings of stress symptoms in their lives during the past 12 months (refer to Appendix Two). This section of the questionnaire was administered to the appropriate interviewees prior to them dealing with the other section of the questionnaire relating directly to the impacts of the roading project.

Life events and life changes are defined by Thoit (cited in Kaplan (ed) 1983, p34) as "objective experiences that disrupt or threaten to disrupt an individual's usual activities, causing a substantial readjustment in that individual's behaviour". The aspect of readjustment by the individual is the most crucial aspect, more so than the positive or negative nature of the change. Such major events threaten the physical survival or emotional wellbeing of the individual. The

"experience of undesirable, uncontrollable events may result in harmful psychological consequences when events are perceived as uncontrollable, feelings of helplessness and hopelessness will result." (Kaplan, 1983, 60).

The number of events of major change perceived by the interviewees gives an indication of the general level of life changes occurring among the community members.

The scale is a list of 43 life events or life changes which was modified slightly to the New Zealand and current day situation with regard to terms used and dollar values as well as including an item relating to the acquisition of residential property. The actual events were not required to be identified, only the number of events that subjects believed that they had experienced in the last 12 months. For this purpose a box was provided and subjects had to tick a square for each event. It could generally be assumed that the group would all include the event of property acquisition as an experience and hence total at least one stressful event. The relative number of events would give an indication of the stress being experienced with each project and between projects. The

impact of property acquisition would also be more stressful on those subjects already experiencing a large degree of stress through other life events affecting them.

The use of a psychosomatic list of stress symptoms was used in conjunction with the life changes / events list in order to attempt to identify those people who were greatest affected by the acquisition. Several psychosomatic symptom items that would indicate stress were evaluated by the subjects on an ordinal five point scale. The affected residents had to rate each symptom on the frequency of their experience of it between the options of; often (4), sometimes (3), occasionally (2), rarely (1) and never (0). An overall stress symptom rating could be obtained and used for comparison between different projects. A high rating would generally indicate a higher level of general stress. The scale as noted by Thoits (cited in Kaplan 1983, 45) "serves primarily to indicate generalised distress or anxiety rather than to identify specific disorders".

Business owners, including horticulturalists and farmers were not asked to complete the life changes / events or the stress symptoms rating scale. However, an additional question was included in their interview which asked if they considered the designation or land acquisition to be an extra business stress or worry. Where subjects indicated that they did consider it to be an extra stress, they were then asked to rate the resulting level of stress in comparison to other business concerns affecting them. Again a five point ordinal scale was used with "4" indicating a very high level of stress and "0" a very low level of stress.

3.4.4 Interview Approach

People affected by a roading project were approached directly to see if they were willing to participate in this research investigation. The majority of people were visited in person without any prior warning and then an arrangement was made to conduct the interview at a later, more convenient time. Property owners affected by the two motorways were, in most cases, able to be identified from media publicity or by other affected property owners. In these cases contact by telephone was made prior to conducting the interview.

The actual interviews were mainly conducted on a face to face basis with the affected individual property owner or owners. However, in some cases this was not possible with the time frame allowed for conducting the interviews. In these situations, most people were still keen to participate and consequently offered to complete a copy of the questionnaire and either have it collected or return it by post.

The time take to conduct each interview varied considerably from only a couple of minutes in cases where the affected owners were going to complete the questionnaire themselves and return it, to more than two hours in the case of several elderly residents who were very keen to talk in depth about their experiences and share their collection of newspaper cuttings and correspondence.

Interviewees were informed of the purpose of the interview and that results would form part of an independent research project. The independent nature of the research was very important in gaining people's co-operation because when first approached, some property owners were hesitant and suspicious that the interviews were being conducted on behalf of the roading authority. They were concerned that the information could be used against them in the finalisation of property purchase agreements.

The interviewees generally completed the survey themselves, while the researcher talked them through the individual questions to ensure full understanding. In cases where the people had difficulty recording their own responses, the interviewer recorded their verbal responses. Often during interviews, additional comments made by the interviewees were recorded by the researcher. Many affected property owners were keen to discuss their own experiences in great detail.

3.5 CHAPTER SUMMARY

This chapter outlined the four case study areas that were selected for researching the impacts of roading designations and construction on affected property owners and the suffering of psychological stress. The method of research was explained, including the process used for the selection of interview participants and the design of the

questionnaire for both residential and business property owners. The interview approach for this research was also discussed as well as the adaptation of this approach that was required once out in the field.

Chapter four discusses the findings from the research survey interviews conducted in each of the four case study areas. The results from each study area are analysed individually and then similarities and differences between areas are considered.

CHAPTER FOUR

FINDINGS AND ANALYSIS

This chapter presents the findings from the survey interviews conducted for this research. The results from interviews carried out in each of the four study areas are discussed and analysed. Similarities of interview findings from the four study areas are examined, as well as differences between them. The research method employed is also reviewed in this chapter.

4.1 OVERVIEW OF RESEARCH APPROACH AND FINDINGS

The response from property owners approached to participate in the research was very positive. Nearly all people affected by the four roading projects were only too happy to complete the questionnaire and be interviewed on their experiences. Two property owners did not wish to be involved, both of these people were affected by the widening of Yaldhurst Road. One of these property owners had initially agreed to take part but on reading the questionnaire declined to complete it because they considered it to be too personal and “the information could be used by marketing companies”. Despite reassurances to the contrary, it proved impossible to alter this person’s view. The other owner who declined to participate, was a 92 year old woman. She appeared to be rather overwhelmed by the whole situation and commented that “her nephew had dealt with everything and she didn’t know anything about the road works”. The researcher concluded that in order not to create any more stress for this person, it was better not to pursue the details of this particular property acquisition any further.

The general findings from the questionnaire sections are discussed below. The method used to measure the level of psychological stress suffered amongst affected residents can be considered more as exploratory research. To the researcher’s knowledge, no

direct attempt to measure psychological stress as a result of a stressor such as a roading development had ever been undertaken previously.

4.1.1 Residents' Stress Symptoms and Index of Stressful Events

Interviewees whose residences were affected by a roading development were nearly all located in the Yaldhurst Road study area. Fourteen interviewees had residential property affected by the widening of Yaldhurst Road, while another four interviewees had residences affected by the Northern Arterial and three more were affected by the St Aubyn Street project. Almost all of these interviewees, whose residential property was affected, acknowledged that the roading project had some degree of stressful impact on their lives.



Plate 1 **Yaldhurst Road Widening** Some affected properties lost frontages of up to 5 metres. This photograph clearly shows the acquired area of land sandwiched between the old white roughcast fence and the newly constructed concrete block fence. One resident commented that “while they were in the process of taking my land and removing the grass and

plants I couldn't find homes for, just looking out my front window made me want to cry."

Quantification of the degree of stress suffered individually or within entire households is extremely difficult to establish much beyond the level perceived and reported by subjects. The reporting of the number of stress symptoms suffered within the past 12 months by the subjects affected by roading projects serves to provide a preliminary index of the stress suffered by those directly affected by the particular project. An indicative stress level index has been established for each roading project where residential properties were affected. However, it is important to note that the symptoms of stress experienced by affected residents are not necessary directly caused by the roading project but may have been the result of factors impacting on the individuals interviewed.

The number of life changes or events impacting on the affected residents were used to give an indication of the other pressures that these people may be suffering from stress as a result of their presence. The life change indicator combined with the indicative stress level index serves more to set the context for the occurrence of the roading project rather than to provide a definitive causal measurement of the resulting stress from the roading development. The use of these measurements demonstrate that, with some investment of time, more robust measurements of the level of psychological stress suffered could be undertaken as part of future roading evaluations.

However, it is important to note that even though this section of the interview questionnaire measuring stress symptoms and life events/changes, was administered prior to subjects completing specific questions based on the roading project, there may have been some bias introduced to residents' responses. By even mentioning the roading project and the fact that this research survey was in any way connected with it, may have coloured the responses received. Any negative thoughts or attitudes that the residents had towards the roading project could well have been carried over to their responses to the stress symptoms and life changes questionnaire section and affected the outcome.

Clearly, it was necessary to explain what the research was focusing on and the reason that these people had been selected, not only to ensure their co-operation, but also for ethical reasons and to ensure the personal safety of the researcher.

4.1.2 Roding Project Section of Questionnaire

The use of different questionnaires containing questions tailored to reflect the circumstances of the particular type of property owner being interviewed proved a successful approach. Responses to questions asked were easily elicited from affected property owners because these people did not need to spend additional time interpreting their answers to fit any ambiguous questions that were unrelated to their own circumstances. It also demonstrated that time had been taken by the researcher to understand the affected property owner's situation before approaching them.

This was particularly the case for owners of properties affected by the Napier to Hastings motorway who had sold the land but were leasing it back from Transit New Zealand until construction commenced. Many of these people, although appearing surprised that the researcher was aware of this arrangement, were happy to comment on the details of the lease and their level of satisfaction with it.

4.2 FINDINGS FROM EACH CASE STUDY AREA

The interviews conducted at each of the case study areas produced some interesting findings. While no close similarities emerged from the four study areas, differences were not significant. These are discussed on detail below.

4.2.1 Findings from the St Albans Section of the Northern Arterial

Only four property owners were interviewed from a total of more than 100 property owners who were originally affected by the designation of the Northern Arterial.

Intensive efforts were made to locate all the original property owners affected by the 1966 designation. Personal testimony presented at the Tribunal hearings by the St Albans Residents Association proved helpful as did the contacts that interviewees had with other former St Albans residents. As mentioned earlier, some owners had since died and it was possible only to interview four property owners. Three of the interviewees had shifted from their affected property. All had lived at their affected property for more than 20 years and were aged over 60 years of age.

The only resident affected by the Northern Arterial who still remained in their property scored 26 on the stress symptom scale from a possible 56 and indicated that they were affected by two life changes/events out of a list of 42. This stress symptom score appears relatively high, compared to the scores indicated by people affected by other roading projects. However, the sample size is too small to make any further assumptions.

The other interviewees who had shifted homes all commented that it had been very upsetting and they could recall at the time experiencing stress symptoms such as loss of sleep, increased minor illnesses, a loss of interest in their previous home or section and feelings that no one cared.

The level of communication was rated by the four respondents as being between satisfactory or poor. Where a satisfactory rating was given, one resident commented that this was because of their own efforts in pursuing answers to their questions rather than as a result of initiatives from the roading authority.

Forms of communication used by the roading authority were letters, newspaper articles, public meetings and one interviewee had some personal contact. However, on further investigation and in talking with officials at Transit New Zealand, it appears that the public meetings had been convened by the St Albans Residents Association and not by the roading authority, although the latter had fronted to answer questions.

None of the affected residents were happy with the level of public information available or with the level of public involvement or consultation. All affected property owners interviewed had the impression that they were considered by the roading authority as an intrusion in the process and the less they knew, the better.



Plate 2 **Wasteland in the St Albans Section of the Northern Arterial.** Some properties were purchased along the proposed motorway route and then, following their lease to destructive tenants, were demolished leaving behind pockets of wasteland. Often these became a substitute dump site for unwanted rubbish, blotting the local environment.

All interviewees believed that the process could be improved relatively easily. They emphasised that more contact between the officials concerned and affected residents was required from the start of projects and not at the final stage of negotiations. Prior to being affected by this roading project, all interviewees had very little experience dealing with councils or government departments and little knowledge of the statutory processes involved.

Two interviewees believed that the community still had some degree of control over whether the roading development proceeded at times following the designation of the preferred motorway route. The other two respondents were rather more pessimistic and did not believe that at any time themselves or the community as a whole had any control over the motorway's future. One elderly resident who had shifted commented that “they just do what they want anyway”.



Plate 3 **Berwick Street Extension adjacent to proposed Northern Arterial corridor in St Albans.** In contrast to the wasteland created with the removal of homes the construction of a road can sometimes create a more pleasant environment. Where the total area of a purchased property was not required for road construction, it has been left as reserve adjacent to the new road.

Prior to the designation being imposed over the properties of the interviewees, only one resident had considered moving home. The others interviewees had all chosen to reside in St Albans and raise their families there and were not keen to move away from the

local community and contacts established. The only resident that still remained had lived in her house all of her life and could not even imagine living anywhere else. Other residents noted that once properties began to be sold around their homes and temporary tenants moved in, they did begin to consider the possibility of shifting.

Three property owners had shifted from their homes that were affected by the roading designation. Two property owners had moved away from the St Albans area while the third had moved to another part of the suburb that was unaffected by the motorway. Two interviewees had shifted to similar sized houses while the other had moved to a smaller flat once their spouse had died. The owners' new homes all contained the same number of rooms as their previous residence in St Albans. It was interesting to note that all interviewees were not interested in re-purchasing their former property even if it was offered back to them. All were now very happy in their new residences, even though it had taken a while to adjust initially to the change. The estimates people had of the time taken to adjust to their new surroundings range from one year to five. All interviewees considered that it had been a major adjustment for them.

None of the people who had sold their properties to the roading authority were happy with the amount of money that they received. Expressions of sadness, worry and sometimes grief as a result of the shift from their home against their freewill were particularly common, some subjects also expressed a degree of anger and frustration at the system which they felt had totally disregarded their needs. No assistance of any sort was offered to these people when they moved.

One elderly resident could not drive and had had difficulty finding another home because of her limited mobility. Another former St Albans resident was particularly annoyed by the process and the long delay in finalising the sale agreement. This particular person had purchased another property just prior to moving from their St Albans home. However, they were forced to use bridging finance for four months while they waited for funds from the sale of their St Albans home. This additional cost was never compensated and the residents were quite convinced that this cost was forced on them by the roading authority's bureaucracy. All of the affected residents thought that

they had been disadvantaged financially by both the designation, and in the case of those that had shifted, by the forced relocation.

4.2.2 Findings From the Yaldhurst Road Widening Project

The widening of Yaldhurst Road affected a total of 35 properties, although only half this number took part in the research. Three affected business owners were interviewed as well as 14 residential property owners. Five interviewees had resided at their Yaldhurst Road home for longer than 20 years while another resident had lived there less than one year. The other residents interviewed had lived there for less than five years or for between 11 and 20 years.

The survey of life changes/events indicated quite a high average result across all interviewees, of 4.8 changes or events. Individual scores ranged from 1 to 16 life changes or events affecting the interviewee over the previous 12 months. The stress symptom indicator had a reasonably high average of 23.7. These results would indicate that some stress was being suffered and by the fact that all survey respondents identified at least one life change or event affecting them, this would tend to suggest that the roading project could well be a cause of stress.

Two of the three business owners interviewed considered that the road widening was another business concern or worry. One of these rated it a minor concern while the other, who had been forced to relocate, considered it to be a major concern or worry.

The types of communication employed by the roading authority in their dealings with the affected property owners included advanced publicity, letters, a public meeting, a progress update newsletter and local newspaper articles. Half of the affected residential property owners had personal contact with officials from the roading authority while all the business owners also had had personal contact.



Plates 4 and 5 **Properties Affected in Yaldhurst Road.** Above, an affected residential property with the frontage being acquired. Below, previously on this site was the office of a real estate company which was forced to relocate outside of the area where it main sales were located.



Overall, the affected property owners were generally happy with the level of communication between themselves and the roading authority. Only two interviewees rated this as being poor, while half of the respondents considered that this aspect was satisfactory. Three people rated the level of communication as good while two even considered it to be excellent. In the case of the five interviewees who rated the level of communication highly, all had had personal contact with roading officials. Business owners rated the level of communication as satisfactory, or poor. Not surprisingly, the poor rating was made by the business owner who was forced to relocate.

The purchase of properties was conducted by representatives from the Department of Survey and Land Information on behalf of the roading authority. One of these purchase officers, Steve Gilbert, believe that advanced publicity and meetings held with the community helped to make their job easier. Steve Gilbert commented that;

“property owners knew the reason why their property frontages were required and the process that would be involved from information presented at the public meetings. People already knew what to expect and were prepared when the time came to purchase the land.”

Five property owners were happy with the level of public information provided, compared to nine who were unhappy. This same division was also apparent for the assessment of the level of public consultation. It would appear from these findings and the comments made during interviews, that where people were persistent and sought out the answers to questions themselves, they were usually given adequate responses. Overall, 11 resident interviewees felt that the process of communication could be improved, while three believed it already to be sufficient. Two business operators also thought that the process could be improved while one did not think that this was possible. This person considered that the roading authority played by their own rules and were uncooperative.

Suggestions made by interviewees for ways in which the roading authority could improve communication included:

- producing construction timetable information with the correct dates for affected residents
- holding small meetings to ensure that the officials took note of the residents' views
- producing a leaflet or booklet on compensation
- making regular phone contact with residents to canvas any concerns they may have
- "treating the elderly better".

One interviewee was very keen for residents to be given timetable information on roading projects after their experience of finding a trench dug across their property entrance one day when they were expecting the delivery of firewood. Another resident had been annoyed that their electricity and water supply had been temporarily disconnected for part of a day without any prior warning being given.

Respondents were evenly split as to whether more direct contact with officials was required. Seven residents and one business interviewee thought that this would have been helpful while the other seven residents and another business owner did not believe that it would have made any difference. One resident was particularly pessimistic and believed that nothing could be done to stop their property from being taken. While another business owner was unsure whether this would have been of any further assistance.

Interviewees' previous experience and knowledge of councils and roading authorities ranged widely. Five resident respondents considered themselves to have a high level of prior experience or to be knowledgeable in this area, one respondent believed they had an average level of experience while eight considered themselves to have no prior experience or knowledge. All three business operators also considered that they had no prior roading authority knowledge or experience.

Eight property owners were aware of the designation when they purchased their property but many considered that it was not relevant to them as it had been in existence for so long with no action occurring. Six respondents said that they were not aware of the designation when they bought their residences. However, some of these six people

already owned their properties when the designation was imposed and this could explain their response.

Nine interviewees commented that they would not consider shifting once they had lost part of their property frontage. One person said that they could not afford to even if they wished to move. Four respondents had considered moving but all were going to wait until the road widening was completed to evaluate the effects and then make a decision on shifting. All interviewees rated their attachment to their home as medium to high which may explain the apparent reluctance to shift in some cases.

One business operator believed that the road widening had interfered with future business plans. The other two business respondents did not consider it to have affected them in this way.

Five residents were happy with the market value that they had received from the roading authority for their property frontage. At the time of conducting the survey, two residents were still negotiating the sale and could not comment on this question. Half of the residents were not happy with the amount they received. Two of the business owners were also unhappy while another was still waiting to be paid.

Injurious affection work was carried out on most properties and generally related to the replacement of front fences and the shifting of plants and scrubs. Residents were consulted as to the work they required, with some electing to have improved fences erected to act as a barrier to increased traffic noise. Six respondents were happy with the injurious affection work carried out. Three were unhappy. Their complaints related to plants and trees being damaged, and fences and garages not being built as they had wished or priced appropriately. Four others were still awaiting for the completion of the work on their properties before they made any judgment.

Twelve interviewees believed that with the widening of the road they would now suffer more from traffic effects. Eight residents and one business respondent believed that they had been disadvantaged both by the roading designation and by the acquisition of

part of their property. Three people considered that there was no disadvantage to them while four, including two business operators, did not know.

4.2.3 Findings From the St Aubyn Street Widening Project

Eleven Businesses and two residents affected by the St Aubyn Street widening project in Hastings were interviewed. One resident was aged over 60 years and had lived at their property for 36 years. The other resident interviewed had been there for 6 -10 years and was aged in their thirties.

Resident interviewees averaged two life events/changes over the previous 12 months and scored an average of 19.5 on the stress symptom index. While 10 business owners considered that the road widening was an extra stress or business concern. Six rated it as a high level of stress compared to other business concerns and four considered it to be a medium to low business stress.

Interviewee ratings of the level of communication ranged widely. Both residents considered it to be poor, despite both having had personal contact with roading authority representatives. In contrast it would appear that businesses had had a better overall level of communication, with one business owner rated it as excellent and six considered it to be good. Three interviewees believed it was satisfactory and only one rated it as poor.

Six of the business owners had had personal contact with the roading officials and all affected property owners had received letters on the subject. Two business owners mentioned receiving a newsletter updating progress on the project. A number of newspaper articles had also been written, although these were considered to be council propaganda and viewed with some cynicism by the residents affected.

Six business owners were happy at the level of public information available but five business owners and the two residents were not. One resident considered that they had



Plates 6 St Aubyn Street Project Information



Plate 7 Residence Cleared from Section for St Aubyn Street Widening

had to have legal representation throughout the process in order to access the information they required. The interviewees were similarly split regarding their satisfaction with the level of public involvement. Seven business owners and the two residents believed that communication processes could have been improved and made suggestions such as having more direct contact with officials, receiving more update newsletters and generally having more regular communication. Eight interviewees believed that more direct contact was required between roading officials and themselves. The majority of respondents had an average to low level of prior experience or knowledge of the roading authority.

Four of the business operators had noticed a decline in customers since work on the road widening had commenced. One interviewee believed that this decline was the result of the removal of on-street parking near his premises. Two business owners were considering shifting as was the resident who had lost the frontage of their property. The resident whose total property was acquired had not previously planned to move home. Their new home was in the same neighbourhood although much smaller in size to their old home.

Three of the business owners were aware of the designation when they purchased their business while eight were not. Neither resident was aware of the roading designation when they purchased their properties. Five business owners also believed that the roading project had interfered with future business plans.

Three business operators felt that they had been financially disadvantaged by the designation and four thought that the property acquisition had disadvantaged them. Both residents felt that they had not been disadvantaged by either the designation or property acquisition. Both residents were happy with the market value that they eventually received for their properties. Although both commented that this was only achieved after considerable effort on their part and legal involvement. The resident that had had their total property acquired commented that on shifting homes considerable adjustment had been needed. They received no additional assistance from the roading authority but believed that help with organising their shift would have been appreciated.



Plate 8 St Aubyn Street Construction Site.

In places where the road had been widened new footpaths were also constructed. Unfortunately these remained in the above half completed state for many months to the detriment of many pedestrians and clients of adjacent businesses.

Seven of the businesses had not yet completed negotiations over the sale of their properties. Of those that had only one was not happy with the amount they received. The injurious affection work was still to be undertaken following the completion of the actual carriageway widening.

4.2.4 Findings From the Napier-Hastings Motorway Project

Ten business operators affected by the Napier-Hastings Motorway were interviewed. The nature of the businesses generally related to orcharding, growing market crops and farming. All interviewees, except one lived on their properties and all considered the proposed motorway designation to be a business stress or concern. One person considered this stress to be very high compared to other business concerns while the other nine respondents rated it as average to high.

Four interviewees considered that the level of communication between themselves and roading officials was poor. Five interviewees though that it was satisfactory and one rated it as good. Forms of communication used were letters, personal contact either with themselves or their lawyer and more commonly through newspaper articles. Public meetings on the motorway had been held but these had been organised by the community and not by the roading authority. Nine respondents were not happy at the level of public information available or public involvement.

All affected property owners believed that the communication process could have been improved. Nine were in favour of having more direct contact on a regular basis with the roading authority. Several felt frustrated that despite being directly affected by the project, they usually only found out what the latest progress was on it through the media.

Nine of the affected property owners had very little prior experience or knowledge of the roading authority while one respondent considered themselves to be very experienced in this area. Interviewees commented that there was some confusion as to

who to contact regarding the project because much of the work on it had been contracted out by Transit New Zealand to Works Consultancy Services.

Up to 10% of some properties were required for the construction of the motorway and eight interviewees considered that their land would become less viable as a result of the acquisition. Six of the property owners had already sold the affected land but were leasing it back until construction commenced. Four out of the five lease holders were happy with the arrangement. One owner was still refusing to sell mainly due to what he considered as unfavourable lease arrangements. Four respondents commented that the designation was affecting their future business plans.

None of the interviewees were considering moving as a result of the motorway but several said they would re-evaluate this once the road was completed and could assess its effects. Some commented that the road could increase the number of trespassers on their land and could have a detrimental effect on their stock. Severance resulting from the motorway was also a common concern with many owners having regular interaction with neighbours on the other side of the proposed motorway. One farmer shared machinery with an adjacent neighbour but the existence of a motorway would mean they would have to shift machinery using public roads or cease this practice.

Only two interviewees were happy with the market value they had received for their land while four were not happy. Four owners were yet to sell and were strong-minded as to what agreements they would make. The owner of the largest property affected which would be cut in two by the motorway, had already indicated that they required two over or underpasses to be constructed. These accesses were also to be wide enough for vehicles to pass through. Negotiations on this particular purchase appeared complex and were being dealt with by lawyers. The other owners who were yet to sell were also reliant on legal counsel for all their dealings.

4.3 DISCUSSION OF CASE STUDY FINDINGS

It appears from research findings that roading projects in New Zealand are generating psychological stress. Interviewees from all four projects acknowledged that the project had caused them to suffer stress or had acted as another business concern or worry. Affected residents displayed symptoms of stress and anecdotal evidence indicated that some of this could be attributed to the effects of the roading project.

The levels of satisfaction with roading authority communication varied across the study sites. It appeared that some people were treated differently to others. Where affected property owners had demanded explanations, these were provided to them. But other interviewees were left very much in the dark if they did not pursue matters further. There was a perception that more could have been done by the roading authority to improve communication. The facilitation of a public meeting at the commencement of the Yaldhurst Road widening project while perceived cynically by some, allowed those affected to gain a basic understanding of the overall project and to identify officials with responsibility for the project.

The area of market values, additional assistance and compensation also appears to be very contentious. Many owners who had sold their properties were unhappy with the price received. This dissatisfaction was more noticeable in the two longer running motorway projects where market prices had been affected by the imposition of a designation for a long period of time.

4.4 CHAPTER SUMMARY

This chapter has considered the approach taken in conducting this research and its merits. The survey findings from each of the four case studies have been discussed and important factors in the mitigation of psychological stress identified. These findings are examined in relation to the research hypotheses in Chapter Five.

CHAPTER FIVE

DISCUSSION OF RESEARCH HYPOTHESES AND CONCLUSIONS

Chapter five discusses the survey findings in relation to the research hypotheses that were developed from literature reviewed in Chapter two. From this discussion, a number of recommendations are made for changes to the procedure that roading authorities follow when dealing with property owners. Final conclusions are drawn and suggestions for further research in the area of psychological stress resulting from roading designations and developments.

5.1 ROADING AUTHORITY COMMUNICATION

Most people felt angry and upset by the process rather than by the actual acquisition of their property. The comment that “ I have lost land and I still do not really know why the road needs widening or why other options were not preferred” was a common theme of responses from affected owners.

Hypothesis One

The first hypothesis that more direct communication between the officials and the residents affected would increase the residents' level of understanding of the project and decrease the amount of psychological stress suffered as a result of uncertainty is supported.

The issue of communication was an area where overall subjects demonstrated a high level of displeasure at the performance of the roading project officials. The most

important factor, in determining residents' and business operators' satisfaction with the level of communication over the project, appears to be whether those affected had any direct personal contact with the roading officials concerned.

Poor ratings for communication were recorded by 30% of the residents and over a third of businesses' respondents. In some cases, those people directly affected had learned more about the works to be undertaken on their property through the media than through any direct correspondence or personal approaches from the roading authorities involved.

In contrast, all but one of those business operators who rated communication as *Excellent* or *Good*, had had personal contact with the roading authority officials. All of the residents who had personal contact with roading authority representatives also rated communication as *Good* or *Excellent*. Some residents commented that initially communication was very poor. They were told that part of their property was required for roading development but were given no indication of when it may be needed or for what exact purpose it was to be put to. Most people had not been shown plans of the final roading design and had no idea what the project was really aiming to produce.

Communication is a means that has considerable potential for decreasing the amount of distress suffered. Some of these aspects would represent little additional cost to an authority sponsoring a project but would result in a significant decrease in stress suffered and promote better understanding on both sides. Specific factors which affected property owners commonly identified as assisting to mitigate the suffering of stress include:

- Increasing the level of public involvement such as organised public meetings as an opportunity to inform the community of the reasons for the project.
- Having more personal contact and direct communication, so those immediately affected are not reliant on third hand information from the media.
- Disseminating newsletters updating those affected on the timetabling and progress of works.

- Informing those affected of the organisations involved in, and responsible for, the project as well as providing them with a nominated contact for people require further information.
- Producing and distributing information pamphlets outlining the restrictions on property rights under a designation, and the compensation and assistance (such as legal aid) available to those affected.

The problem of knowing just what organisation to contact in order to discuss details of the development also caused affected land owners some concerns, particularly on the two motorway projects where Transit New Zealand, Works Consultancy and the local authority were all involved in various aspects of design, funding and district plan incorporation. Many property owners affected by a project stated that the level of communication only seemed to improve if they relentlessly pursued their concerns to the point where officials were forced to provide some answers in order to “get them off their backs.” A number of affected parties demanded an opportunity to speak to the roading authority representatives face to face. Once this direct line of communication had been established then any subsequent communication was rated well by this group of subjects, but was considered the result of their own efforts rather than through the initiative of the authority concerned.

The majority of subjects had received the standard letter advising that the property was required for the roading project. The remaining portion that had not received direct letters can be accounted for by the fact that they were only tenants and not the property’s owner and the fact that some land owners had purchased property after a designation had been applied. There was one case where a subject owned property that was included in the design for a flyover exit, yet they were not aware of this and had never been approached by any roading authority. After seeing the publicly available motorway design they were prompted to seek clarification. In their case there had not been any transfer of land since the original design in the 1960’s but it was possible that subsequent designs had eliminated the need to acquire their property. But while it may not have been affected directly it would still border on the new development and as such these people felt that they should have been kept in contact with by the roading authorities.

Nearly sixty percent of subjects did have some personal contact with the roading officials and generally these people recorded a lower level of stress.

Media articles were another common source of information on the projects and in many cases provided those affected with greater insight into the project than they had acquired from their own direct involvement. An increasingly common form of information is the use of periodic newsletters, updating property owner and tenants on the progress of works and the timetabling of further developments. Where these had been employed, very favourable comments were recorded by subjects.

Where public meetings were held to inform those affected about the development, they were generally initiated by the local residents or businesses and not by the roading authority. Again favourable comments were recorded about the helpfulness of such occasions in the transfer of information and in the sharing of concerns between the groups. While some roading authorities viewed such meetings as an opportunity for direct conflict, there was however good opportunity to fully inform people of the needs for projects and possibly to take on board some of their local concerns.

The majority of subjects felt that more direct contact with the roading officials was needed. Seventy percent of residential subjects wanted more direct contact and sixty - eight percent of business operators were also in favour of this. One subject was unsure as to whether more direct contact was needed or not, while a couple of other subjects who did not think that it was needed, expressed sentiments that "the Council had their own agenda and any increased contact wouldn't have any effect on the outcome" or that "these people (roading officials) have their own sets of rules and are uncompromising on the wishes of anyone else."

Hypothesis Two

The second hypothesis that residents who feel happy with the level of public information and participation involved in the project's planning will suffer a lower level of stress than residents who feel they are not adequately informed on issues or that their

opinions are not listened to or responded to, is supported. It is also supported that residents who have a greater knowledge of their compensation entitlements and the nature of the assistance available to them, may suffer less stress than those residents who have less knowledge of the compensation and assistance available.

The majority of subjects directly affected by a roading project were not happy at the level of public information available. Three quarters of the residential subjects affected were unhappy, compared with around fifty-seven percent of the businesses' operators who were also unhappy with the level of public information. Similarly a large degree of dissatisfaction was expressed at the level of public involvement and consultation, with seventy-five percent of residents affected unhappy and sixty-one percent of business operators not happy either. Again there were comments that those affected had to pursue answers to their queries and there was generally a lack of free-flowing information out to the affected community.

A significant majority of subjects believed that their dealings over the matter of property acquisition and effects of the road works could have been improved. Eighty -five percent of residents affected by the roading work were of the opinion that the process that they had experienced could have been improved. Less business operators believed that the process could have been improved at sixty-six percent. It appears that from these comparative figures and from the comments expressed by the parties there was some difference in the way that those affected were dealt with.

The majority of respondents wanted more information on the timetabling of the works, especially so that they could anticipate problems with access to their property. One subject rushed home early from work one day during the construction period, planning to get away on holiday only to discover that a large drain hole had been dug outside and that no access across this was possible for a couple of hours until a drainpipe was laid and the hole filled. A number of subjects suggested that a newsletter outlining what they could expect in the way of the types of intrusions such as noise, access disruption as well as power and water cuts would be helpful in the planning of their own lives. Many did not mind altering their plans or just putting up with some level of inconvenience if they had enough prior warning, rather than have these major

disruptions forced on them without any notice. At times during physical developments on the project, some indication had been given to those bordering the site of what to expect and when this would happen but in practice this proved to be quite inaccurate, particularly with regard to the time frames involved. The fact that no further revised timetable updates were provided to those affected was commented on by several subjects.

Suggestions for improvements in the communication process included:

- *"Good explanation of the exact reasons for the widening or the new roading project given to those affected and details of the final design."*
- *"More personal contact and roading authority organised community meetings to provide the opportunity for those planning the project to gauge the views of the affected communities and act on any well-founded concerns at the design early in the process."*
- *"The free provision of booklets and other pamphlet information on the process of designation and property acquisition. As well as all affected being well informed of the rights of individuals to legal assistance, a point many were not aware of until a settlement of property transfer, other forms of assistance available and their entitlement to relocation costs if the total property is acquired."*
- *"Many elderly wanted extra assistance with understanding the process and the right to have family or other support present when roading officials met to explain the process to them."*
- *"More accurate information on the timetabling of works and how people will be affected. If there are changes to this then further updates or a help desk number should be provided."*
- *"It should be recommended that everyone obtain some legal guidance and representation from the moment they are notified that their property could be affected."*
- *"Ever individual property affected should be visited to ascertain what assistance the residents or business operators require and to answer any questions they have."*

Property owners currently endure the effects of an uninvited intrusion such as a roading development on their lives with very little additional assistance provided. Extra assistance targeted to the particular individuals affected who require it, would ease these people's distress. Some further regard may need to be given more to the individual circumstances of the affected owners. The availability of counsellors, social workers, and business and agricultural consultants could potentially reduce the strain on many people. On a smaller scale, even providing assistance in the search for a new home for people who must relocate, or supplying information on ways to reduce the impact of traffic noise, could be valuable in mitigating the effects of psychological stress.

For example, many residents affected were not aware that any legal costs would be reimbursed and consequently did not involve a lawyer until they had completed negotiations for the sale of the property. Other forms of non-monetary assistance should be provided to affected property owners, these could include assistance with shifting arrangements and searching for a new property.

5.2 OTHER MITIGATING FACTORS

Flagging Land Titles Of Designated Properties

Properties that are designated for future roading developments should clearly indicate this in their title documentation so prospective owners are fully aware of this fact. This is particularly important where projects have been designated for up to 30 years in speculation of a development.

Property Purchase Involving An Independent Negotiator

The St Aubyn Street and the Yaldhurst Road widening projects both used a purchasing agent who was independent of the roading authority. The property purchases required a considerable amount of time to negotiate a settlement between the individual property owners and the Hastings City Council.

The value of this independent approach was reflected in the fact that only 40% of those surveyed believe that the process could have been improved upon, and then cited more minor changes like supplying timetable information of the work. This compares with 83% of total respondents in the other three projects who believed that the process could have been improved.

5.3 CONCLUSIONS AND IDEAS FOR FUTURE RESEARCH

This research has demonstrated that the level of psychological stress being suffered by affected property owners can be assessed. The indicative stress level of affected residents and business operators has the potential, with some further investigation, to be incorporated into the project assessment and evaluation. Where the indicative stress level of an individual is high, special assistance could be made available. Continuous development of the proposed methodology could be undertaken once it was established in practice.

The area of communication between affected property owners and the roading authority appears to be the most significant factor affecting the suffering of psychological stress. Research findings indicate that if roading authorities pay greater attention to this part of the process then benefits would overwhelmingly outweigh the costs. The way that affected property owners were initially treated in respect to communications clearly shaped many of their perceptions of the project and any subsequent dealings.

Some of the communication approaches used in the four case studies proved successful such as a progress newsletter, but generally more direct contact and regularly flows of information are required to improve the level of roading project communications. A communication strategy to address community concerns and information requirements should be established at the commencement of a roading project. Further investigation of the best method of information delivery to affected residents and business operators could be undertaken to ensure that the right information is being provided at the right time to the right people.

APPENDIX ONE

PROJECT EVALUATION MANUAL DEFINITION OF PSYCHOLOGICAL STRESS

"A7.2 INTANGIBLE EFFECTS OF TRANSPORTATION PROJECTS

*...Psychological Stress any uncompensated stress to property owners
resulting from the placing of a designation or
from purchase of any property required for land
transport purposes from an unwilling seller..."*

"A7.14 PSYCHOLOGICAL STRESS FROM FORCED PROPERTY PURCHASE.

Definition - *The uncompensated distress and discomfort resulting from
compulsory property purchase.*

When a route improvement or new route construction requires the purchase of properties that are on the line of the route, it can lead to psychological distress to the owners of the properties affected. If the property owners are financially compensated for their distress through a mutually agreed price then the intangible considerations can be ignored. However, if the property is designated for compulsory purchase now or at some time in the future, and the owners do not wish to move or the price offered does not compensate the owners for the distress caused, then the intangible costs need to be recognised.

Evaluation of Psychological Stress:

The extent of stress felt will vary from individual to individual and from site to site. It is likely to be most severe for property owners who have lived on the same property for many years. Also distress can be greater for the elderly than for those who are younger. There are some people who are amenable to change if the compensation reflects their discomfort and there are others who do not want to change. There is likely to be greater stress for property owners who lose their whole property than to owners who lose their property frontage.

Reporting of Psychological Stress:

The variations in degree of stress need to be acknowledged when reporting psychological stress in the balance sheet. It will require a property by property inspection and survey of the owners to determine the resistance to purchase. The intangible factor to report is the degree of uncompensated distress or discomfort resulting from the proposed forced purchases. In the project balance sheet it should be noted how many properties/frontages are required for purchase for each of the project options. Also the ascertained resistance to the proposed purchases and the revealed level of distress this will cause should be reported wherever possible"

(Transit New Zealand, Project Evaluation Manual, Revised Edition July 1994).

APPENDIX TWO

RESEARCH QUESTIONNAIRES

SOCIAL READJUSTMENT RATING SCALE

Please read through the following list of stressful life events that require a degree of readjustment in ones life. As you do so please indicate how many of these events would have affected your life (or your families) within the last 12 months, by marking a tick (✓) for each event in the box on the right. It is NOT necessary to indicate what the stressful event was, only the number of relevant events is required.

1. Death of spouse
2. Divorce
3. Marital separation
4. Jail term
5. Death of a close family member
6. Personal injury or illness
7. Marriage
8. Fired at work
9. Marital reconciliation
10. Retirement
11. Change in health of a family member
12. Pregnancy
13. Sex difficulties
14. Gain of new family member
15. Business readjustment
16. Change in financial state
17. Death of close friend
18. Change to different line of work
19. Change in number of arguments with spouse
20. Mortgage over \$50,000
21. Imposition of roading designation/ forced relocation
22. Foreclosure of mortgage or loan
23. Change in responsibilities at work
24. Son or daughter leaving home
25. Trouble with in-laws
26. Outstanding personal achievement
27. Partner begins or stops work
28. Begin or end school
29. Change in living conditions
30. Revision of personal habits
31. Trouble with boss
32. Change in work hours or conditions
33. Change in residence
34. Change in schools
35. Change in recreation
36. Change in church activities
37. Change in social activities
38. Mortgage or loan less than \$50,000
39. Change in sleeping habits
40. Change in number of family get-togethers
41. Change in eating habits
42. Holiday
43. Minor violations of the law

[illegible]

STRESS SYMPTOMS

Stress affects all of us to different degrees and by way of differing symptoms. An indication of how you would rate, in your life, each of the stress symptoms below is needed. Please circle your choice on the scale at the right of each question.

	Often	Sometimes	Occasionally	Rarely	Never
1. Do you generally have a feeling of well-being?	4	3	2	1	0
2. How often do you have crying spells or feel like it?	4	3	2	1	0
3. How often do you not enjoy things any more?	4	3	2	1	0
4. How often do you feel alone or helpless?	4	3	2	1	0
5. How often do you feel people don't care what happens to you?	4	3	2	1	0
6. How often do you feel life is hopeless?	4	3	2	1	0
7. How often do you feel tired in the mornings?	4	3	2	1	0
8. How often do you feel bothered by all sorts of body ailments?	4	3	2	1	0

	Often	Sometimes	Occasionally	Rarely	Never
9. Have you had periods of days or weeks where you can't take care of things because you can't get going?	4	3	2	1	0
10. How often do you have trouble getting or staying asleep?	4	3	2	1	0
11. Do you ever have a loss of appetite?	4	3	2	1	0
12. When things don't turn out the way you hoped do you ever blame yourself?	4	3	2	1	0
13. Do you ever feel that life has changed so much in the modern world that people are powerless to control their lives?	4	3	2	1	0
14. Do you ever wonder if anything is worthwhile any more?	4	3	2	1	0

ROADING DESIGNATION QUESTIONNAIRE. RESIDENTS WHO HAVE MOVED.

1. In relation to the roading designation and acquisition of your home, how would you rate the level of communication between you and the authorities (Transit New Zealand, District/ City Council) concerned?

Excellent _____ Good _____ Satisfactory _____ Poor _____

2. What forms of communication were used by the authorities?
(Please tick)

1. Letter _____ 2. Personal Contact _____
3. Public Meetings _____ 4. Ongoing Newsletters _____
5. Newspaper Articles/Notices _____
6. Other: _____

3. Were you happy with the level of public information available?

Yes _____ No _____

Were you happy with the level of public involvement and consultation?

Yes _____ No _____

Is more direct contact needed between officials and the residents concerned?

Yes _____ No _____

Could your dealings over the matter have been improved at all?

Yes _____ No _____

How ?

4. How much prior experience did you have of dealing with or knowledge of your local Council and/or Transit New Zealand?

Very Experienced/
Knowledgable

No Experience/
Knowledge

4 3 2 1 0

5. Did you ever believe that you, and/or the community affected as a whole, had some control over the roading development's go-ahead?

Yes _____ No _____

If yes, have you since felt that you have lost this control?

Yes _____ No _____

If Yes, at what stage in proceedings did you feel this loss of control over your future?

6. Prior to the designation on your home, had you considered or planned to move?

Yes _____ No _____

7. Do you think, compared to your previous residence, your new home is:

a. A similar type/style of home? Yes _____ No _____

b. Has the same number of rooms? Yes _____ No _____
If No, what is the difference _____

c. Same size section? Yes _____ No _____
If No, what is the difference _____

d. In a similar or the same neighbourhood? Yes _____ No _____

e. If offered your previous home back
would you interested in re-purchasing it? Yes _____ No _____

8. Comparing your present and previous dwellings, how would you rate each of your homes in terms of;

	Excellent				Poor	
a. functional qualities	4	3	2	1	0	
	Previous Home _____			Present Home _____		

	High				Low	
b. your attachment to it?	4	3	2	1	0	
	Previous Home _____			Present Home _____		

9. Were you happy with the "market value" you received for your home? Yes _____ No _____

Did you receive any additional compensation? Yes _____ No _____

10. Were any other types of assistance (e.g loans, help in finding a new home) available to you to aid with relocation?

Yes _____ No _____

If Yes, what were these ?

11. Do you believe that you were financially disadvantaged due to the **designation**?

Yes _____ No _____

12. Do you believe that you were financially disadvantaged due to **relocation**?

Yes _____ No _____

13. Moving residence requires some re-adjustment, how would you rate this for you and your family in terms of:

Adjustment: Major Very little

a. The amount of readjustment: 4 3 2 1 0

b. The time taken to adjust and
get over the move: _____ years _____ months

14. How long had you lived in your previous residence?

Less than 1 year _____ 1-5 years _____
6-10 years _____ 11-20 years _____
20+ years _____

15. How many motor vehicles did you own or have direct access to while you were at your previous residence? _____

16. In terms of stressfulness, how would you rate the experience of relocation due to a roading designation? (please circle)

No stress/ Low

Very upsetting/ High

0

1

2

3

4

17. In retrospect, can you recall you or any of your family suffering from any of the following as a consequence of the designation over your home? (please tick)

a. Loss of sleep _____

b. Loss of appetite _____

c. Increased minor illness _____

d. Loss of interest in your home or section _____

e. Feeling that no one cared what happened to you _____

f. Feeling that life was hopeless _____

18. What are the ages of your household members? Please tick the appropriate age group for each member.

Under 5 years	_____	5-14 years	_____
14-19 years	_____	20-29 years	_____
30-39 years	_____	40-49 years	_____
50-59 years	_____	60 +	_____

19. What is your household income level?

0 - \$ 5 000	_____
\$5 001 - \$10 000	_____
\$10 001 - \$15 000	_____
\$15 001 - \$20 000	_____
\$20 001 - \$30 000	_____
\$30 001 - \$40 000	_____
\$40 001 - \$50 000	_____
\$50 001 +	_____

Thank you very much for your time and co-operation in completing this survey.

ROADING DESIGNATION QUESTIONNAIRE. RESIDENTS WHOSE TOTAL PROPERTY IS AFFECTED.

1. In relation to the roading designation, how would you rate the level of communication between you and the authorities (Transit New Zealand, District/ City Council) concerned?

Excellent _____ **Good** _____ **Satisfactory** _____ **Poor** _____

2. What forms of communication were used by the authorities? (Please tick)

1. Letter _____ 2. Personal Contact _____
 3. Public Meetings _____ 4. Ongoing Newsletters _____
 5. Newspaper Articles/Notices _____
 6. Other: _____

3. Are/were you happy with the level of public information available?

Yes _____ **No** _____

Are/were you happy with the level of public involvement and consultation?

Yes _____ **No** _____

Could it be improved?

Yes _____ **No** _____

How ?

Is more direct contact needed between officials and the residents concerned?

Yes _____ **No** _____

4. How much experience do you have of dealing with or knowledge of your local Council and/or Transit New Zealand?

**Very Experienced/
Knowledgable**

**No Experience/
Knowledge**

4

3

2

1

0

5. Do you believe you, and/or the community affected as a whole, still have some control over the roading development's go-ahead and subsequently its impact on you?

Yes _____ **No** _____

6. Prior to the designation on your home, had you considered or planned to move?

Yes _____ No _____

7. Are you presently planning or preparing to shift your home?

Yes _____ No _____

8. Do you think, compared to your present residence, you will be able to find;

a. A similar home Yes _____ No _____

b. A similar neighbourhood/surroundings Yes _____ No _____

9. If you have lived elsewhere, in comparison to your previous dwellings, how would you rate your present home in terms of its functional qualities and your attachment to it?

Excellent/High

4

3

2

1

Poor/Low

0

10. Are you aware of your rights to compensation?

Yes _____ No _____

11. Are you aware of the assistance (e.g loans) that is available to aid relocation?

Yes _____ No _____

12. Do you believe that you will be financially disadvantaged due to the designation?

Yes _____ No _____

13. Do you believe that you will be financially disadvantaged due to forced relocation?

Yes _____ No _____

14. How long have you lived in your present residence?

Less than 1 year _____

6-10 years _____

20+ years _____

1-5 years _____

11-20 years _____

15. How many motor vehicles do you own or have direct access to? _____

16. What are the ages of your household members? Please tick the appropriate age group for each member.

Under 5 years _____	5-14 years _____	14-19 years _____
20-29 years _____	30-39 years _____	40-49 years _____
50-59 years _____	60 + _____	

17. What is your household income level?

0 - \$ 5 000 _____
5 001 - 10 000 _____
10 001 - 15 000 _____
15 001 - 20 000 _____
20 001 - 30 000 _____
30 001 - 40 000 _____
40 001 - 50 000 _____
50 001 + _____

Thank you very much for your time and co-operation in completing this survey.

ROADING DESIGNATION QUESTIONNAIRE **PARTIAL PROPERTY AFFECTED.**

1. In relation to the roading designation, how would you rate the level of communication between you and the authorities (Transit New Zealand, District/ City Council) concerned?

Excellent_____ **Good**_____ **Satisfactory**_____ **Poor**_____

2. What forms of communication were used by the authorities? (Please tick)

- | | |
|------------------------------------|-----------------------------|
| 1. Letter_____ | 2. Personal Contact_____ |
| 3. Public Meetings_____ | 4. Ongoing Newsletters_____ |
| 5. Newspaper Articles/Notices_____ | |
| 6. Other:_____ | |

3. Are/were you happy with the level of public information available? **Yes**_____ **No**_____

Are/were you happy with the level of public involvement and consultation? **Yes**_____ **No**_____

Could it be improved? **Yes**_____ **No**_____

How ?

Is more direct contact needed between officials and the residents concerned? **Yes**_____ **No**_____

4. How much experience do you have of dealing with or knowledge of local Council and/or Transit New Zealand?

Very Experienced/ Knowledgable					No Experience/ Knowledge
4	3	2	1		0

5. Were you aware of the designation on your property when you bought your home? **Yes**_____ **No**_____

6. Are you now considering moving as a result of the partial acquisition of your property? **Yes**_____ **No**_____

7. What area of land was acquired? _____
Approximate proportion of your total property? _____ %
8. If you have lived elsewhere, in comparison to your previous property, how would you rate your present home in terms of its functional qualities and your attachment to it?
- | Excellent/High | | | | | Poor/Low |
|----------------|---|---|---|---|----------|
| 4 | 3 | 2 | 1 | 0 | |
9. Were you happy with the "market value" you received for your land?
- Yes _____ No _____
10. Were you happy with the injurious affection work carried out on you property? (e.g replacement fences)
- Yes _____ No _____
11. Do you feel you now suffer more from the effects of road traffic outside your home than previously did? (ie. increased noise or vibration)
- Yes _____ No _____
12. Do you believe that you were financially disadvantaged due to the designation?
- Yes _____ No _____
13. Do you believe that you will be financially disadvantaged due to land acquisition?
- Yes _____ No _____
14. How long have you lived in your present residence?
- | | |
|------------------------|-------------------|
| Less than 1 year _____ | 1-5 years _____ |
| 6-10 years _____ | 11-20 years _____ |
| 20+ years _____ | |
15. How many motor vehicles do you own or have direct access to? _____

16. What are the ages of your household members? Please tick the appropriate age group for each member.

Under 5 years _____	5-14 years _____	14-19 years _____
20-29 years _____	30-39 years _____	40-49 years _____
50-59 years _____	60 + _____	

17. What is your household income level?

0 - \$ 5 000 _____
5 001 - 10 000 _____
10 001 - 15 000 _____
15 001 - 20 000 _____
20 001 - 30 000 _____
30 001 - 40 000 _____
40 001 - 50 000 _____
50 001 + _____

Thank you very much for your time and co-operation in completing this survey.

ROADING DESIGNATION QUESTIONNAIRE (BUSINESSES THAT HAVE MOVED)

1. In relation to the roading designation, how would you rate the level of communication between you and the authorities (Transit New Zealand, District/ City Council) concerned?

Excellent_____ **Good**_____ **Satisfactory**_____ **Poor**_____

2. What forms of communication were used by the authorities? (Please tick)

1. Letter_____ 2. Personal Contact_____

3. Public Meetings_____ 4. Ongoing Newsletters_____

5. Newspaper Articles/Notices_____

6. Other:_____

3. Were you happy with the level of public information available? **Yes**_____ **No**_____

Were you happy with the level of public involvement and consultation? **Yes**_____ **No**_____

Could it have been improved? **Yes**_____ **No**_____

How ?

Do you think more direct contact is needed between officials and the residents/businesses affected?

Yes_____ **No**_____

4. How much previous experience did you have of dealing with or knowledge of your local Council and/or Transit New Zealand?

Very Experienced/ Knowledgable					No Experience/ Knowledge
4	3	2	1		0

5. **Are your new business premises;**

a. Within the same community? **Yes**_____ **No**_____

b. Similar in purchase/rental price? **Yes**_____ **No**_____

c. Similar in area size? **Yes**_____ **No**_____

If No what is the difference? **Larger By** _____ **Smaller By** _____

6. Would you have contemplated moving if there had been no designation?

Yes _____ No _____

7. How would you rate the success of your businesses in the new locality?

Better than before _____

Worse than before _____

No noticeable change _____

8. Would you expect to retain some of your established clientele?

Yes _____ No _____

9. Has the designation or relocation interfered with any future plans of the business (eg. expansion or diversification)?

Yes _____ No _____

10. Has the designation (& subsequent forced relocation) acted as an extra stress or extra business worry for you?

Yes _____ No _____

If Yes, how would you rate it compared to other business concerns?

Very High				Very Low
4	3	2	1	0

11. Do you believe that you have been financially disadvantaged due to;

a. the designation Yes _____ No _____

b. forced relocation Yes _____ No _____

12. Were you happy with the "market value" you received for your business

Yes _____ No _____

13. Did you receive any other relocation compensation or assistance?

Yes _____ No _____

Thank you very much for your time and cooperation in completing this survey.

ROADING DESIGNATION QUESTIONNAIRE (URBAN BUSINESSES with partial land loss)

1. In relation to the roading designation, how would you rate the level of communication between you and the authorities (Transit New Zealand, District/ City Council) concerned?

Excellent_____ **Good**_____ **Satisfactory**_____ **Poor**_____

2. What forms of communication were used by the authorities? (Please tick)

1. Letter_____	2. Personal Contact_____
3. Public Meetings_____	4. Ongoing Newsletters_____
5. Newspaper Articles/Notices_____	
6. Other:_____	

3. Were you happy with the level of public information available? **Yes**_____ **No**_____

 Were you happy with the level of public involvement and consultation? **Yes**_____ **No**_____

 Could it have been improved? **Yes**_____ **No**_____

How ?

 Do you think more direct contact is needed between officials and the residents/businesses affected?

Yes_____ **No**_____

4. How much previous experience did you have of dealing with or knowledge of your local Council and/or Transit New Zealand?

Very Experienced/ Knowledgable					No Experience/ Knowledge
4	3	2	1		0

5. To what extent have your business premises been affected by the roading works;

 a. the area affected: **Smaller By** _____

 b. have you notice any decline in business since the road works commenced work?

Yes_____ **No**_____

6. Are you have contemplating moving your premises in the future at all?

Yes_____ **No**_____

7. Were you aware of the designation over the land when you bought the business? Yes _____ No _____
8. Has the designation or relocation interfered with any future plans of the business (eg. expansion or diversification)?
- Yes _____ No _____
9. Has the designation or land acquisition acted as an extra stress or business worry for you?
- Yes _____ No _____

If Yes, how would you rate it compared to other business concerns?

Very High				Very Low
4	3	2	1	0

10. Do you believe that you have been financially disadvantaged due to;
- a. the designation Yes _____ No _____
- b. land acquisition Yes _____ No _____
11. Were you happy with the "market value" you received for land affected?
- Yes _____ No _____
12. Were you happy with the injurious affection work carried out?
(eg replacement of fences)
- Yes _____ No _____

Thank you very much for your time and cooperation in completing this survey

ROADING DESIGNATION QUESTIONNAIRE
(RURAL BUSINESSES with partial land loss)

1. In relation to the roading designation, how would you rate the level of communication between you and the authorities (Transit New Zealand, District/ City Council) concerned?

Excellent_____ **Good**_____ **Satisfactory**_____ **Poor**_____

2. What forms of communication were used by the authorities? (Please tick)

1. Letter_____ 2. Personal Contact_____

3. Public Meetings_____ 4. Ongoing Newsletters_____

5. Newspaper Articles/Notices_____

6. Other:_____

3. Were you happy with the level of public information available? **Yes**_____ **No**_____

Were you happy with the level of public involvement and consultation? **Yes**_____ **No**_____

Could it have been improved? **Yes**_____ **No**_____

How ?

Do you think more direct contact is needed between officials and the residents/businesses affected?

Yes_____ **No**_____

4. How much previous experience did you have of dealing with or knowledge of your local Council and/or Transit New Zealand?

Very Experienced/
Knowledgable

No Experience/
Knowledge of

4 3 2 1 0

5. To what extent has your land been affected by the roading project;
- a. The area affected: Smaller By _____
What proportion is this of your total land _____
- b. Has there been any change in land use ? Yes _____ No _____
If so what was altered?
- c. Have you been happy with the land lease arrangements?
Yes _____ No _____
- d. Once construction of the motorway commences and you lose the use of the leased land do you believe that the use your remaining land will be a viable option?
Yes _____ No _____
6. Are you have contemplating moving from your property in the future at all?
Yes _____ No _____
7. Were you aware of the designation over the land when you bought the property?
Yes _____ No _____
8. Has the designation, land acquisition or leasing arrangements interfered with any future plans for your land (eg. expansion or diversification)?
Yes _____ No _____
9. Has the designation or land acquisition acted as an extra stress or business worry for you?
Yes _____ No _____
- If Yes, how would you rate it compared to other business concerns?**
- | | | | | | |
|------------------|---|---|---|--|-----------------|
| Very High | | | | | Very Low |
| 4 | 3 | 2 | 1 | | 0 |
10. Do you believe that you have been financially disadvantaged due to;
- a. the designation Yes _____ No _____
- b. land acquisition Yes _____ No _____
- c. leasing arrangements Yes _____ No _____
11. Were you happy with the "market value" you received for land affected?
Yes _____ No _____
12. Were you happy with the injurious affection work carried out?
(eg replacement of fences, moving of property access)
Yes _____ No _____

Thank you very much for your time and cooperation in completing this survey.

APPENDIX THREE

PERSONAL CORRESPONDENCE

de Hamel, M. 1991. St Albans Residents Association, Christchurch, 29 July

Gadd, M. 1991. Christchurch City Council, Christchurch, 26 July

Gilbert, S. 1992. Department of Survey and Land Information, Christchurch, 20 September.

Oppenhuis, M. W., 1993. On behalf of Regional Manager, Transit New Zealand,
Christchurch, 28 January.

BIBLIOGRAPHY

- Ackley, K. 1987. Evidence presented in application by St Albans Residents Association in the matter of Christchurch City Council and others v Minister of Works, Christchurch.
- Appleyard, D. and Lintell, M. 1972. 'The environmental quality of city streets: the residents' viewpoint.' American Institute of Planning Journal, 38:2, 84-101.
- Baker W.R., 1987. 'Blight in St Albans Designation Area'. Evidence presented in application by St Albans Residents Association in the matter of Christchurch City Council and others v Minister of Works, Christchurch.
- Bell, R.A., Sundel, M., Aponte, J.F., Murrell, S.A. and Lin, E. (editors) 1983. Assessing Health and Human Service Needs: concepts, methods and applications. Human Science Press, New York.
- Bell, R.A., LeRoy, J.B. and Stephenson, J.J. 1982. 'Evaluating the mediating effects of social support upon life events and depressive symptoms'. Journal of Community Psychology, 10, 325-340.
- Brindle, R.E. 1981. *Local Street Management: observation on implementation problems*. in Traffic, Transportation and Urban Planning. International Conference in Tel Aviv of the Institute of transportation Engineers, Association of Engineers and Architects and the International Technical Cooperation Centre, George Unwin Ltd, New York.
- Buchanan, C.D., 1963. Traffic in Towns. Penguin Books, Harmondsworth.
- Canterbury Regional Planning Authority, 1978a. Second Transport Study - Road Planning. Report 202 'Traffic Service and Network Assumptions', Canterbury Regional Planning Authority, Christchurch.
- Canterbury Regional Planning Authority, 1978b. Second Transport Study - Road Planning. Report 209 'A Consideration of Major Road Network Elements', Canterbury Regional Planning Authority, Christchurch.
- Chivers, J.R., Allan, S.J, Hunt, M.J., 1992. Quantification of Intangibles: a review of intangible factors for Transit New Zealand's Project Evaluation Manual. Transit New Zealand Research Report No.12, Wellington.
- Christchurch City Council, 1988. The Northern Arterial -a compendium on this topic. Traffic Division, Christchurch City Council, Christchurch.
- Crowley, R.W. 1973. 'A case study of the effects of an airport on land values'. Journal of Transport Economics and Policy, 7:2, 144-152.

- Damm, D., Lerman, S.R., Lerner-Lam, E. and Young, J. 1980. 'Response of urban real estate values in anticipation of the Washington metro'. Journal of Transport Economics and Policy, 14:3, 315-336.
- De Boer, E. 1986. Transport Sociology - Social Aspects of Transport Planning. Pergamon Press, Oxford.
- Dickey, J.W., Stuart, R.C., Walter, R.D., Cunningham, M.C., Winslow, A.G., Dieweld, W.G. and Ding, G.D. 1975. Metropolitan Transportation Planning. Scripta Book Company, Washington D.C.
- Dohrenwend, B.S. 1983. 'Stressful life events and illness- implications for need assessment'. p.124-141. Assessing Health and Human Service Needs. Edited by Bell, R.A *et al.* Human Science Press, New York.
- Dohrenwend, B.S. and Dohrenwend B.P. (eds.). 1974. Stressful Life Events: Their nature and effects. John Wiley and Sons, New York.
- Dowall, D.E. and Juhasz, J.B. 1978. 'Trade-off surveys in planning: theory and application'. Environment and Planning A, 10, 125-136.
- Drake, J., Yeadon, H.L. and Evans, D.I. 1969. Motorways. Faber and Faber, London.
- Duhl, L.J. (ed.). 1963. The Urban Condition. Basic Books Inc, New York.
- Evans, G.W. (ed) 1982. Environmental Stress. Cambridge University Press, Cambridge.
- Fellman, G. 1969. 'Neighbourhood protest of an urban highway'. American Institute of Planners Journal, 35:2, 118-122.
- Frick, D. (ed.). 1986. The Quality of Urban Life - Social, psychological and physical conditions. Walter de Gruyter, Berlin.
- Fried, M. 1963. 'Grieving for a lost home. p.151-171. The Urban Condition. Edited by Duhl, L.J. Basic Books Inc, New York.
- Gakenheimer, R. and Wheaton, W.C. 1976. 'Priorities in Urban Transport Research' Transportation, 5:1, 73-91.
- Garrison, W.L., Berry, B.J.L., Marble, D.F., Nystuen, J.D. and Morrill, R.L. 1959. Studies of Highway Development and Geographic Change. University of Washington Press, Seattle.
- Goldberg, M.A. and Heaver, T.D. 1970. 'Evaluating transport corridors: an economic model'. Journal of Transport Economics and Policy, 4:3, 255-264.

- Gruen Associates and De Leuw, Cather and Company, 1978. Environmental Impacts of BART: Final Report, prepared for Metropolitan Transportation Commission, US Department of Transport, Berkeley.
- Hadcroft, B.H., 1987, Evidence presented in application by St Albans Residents Association in the matter of Christchurch City Council and others v Minister of Works, Christchurch.
- Hammersley, M. and Atkinson, P. 1993 (2nd ed.). Ethnography: principles in practice. Rutledge, London.
- Hastings City Council, Havelock North Borough Council, Hawke's Bay County Council, Napier City Council and The National Roads Board. 1986. Heretaunga Plains Transportation Study: 1986 Review. Ministry of Works and Development, Wellington.
- Hearn A., 1987. Review of the 1977 Town and Country Planning Act. Report Commissioned by the NZ Government, Government print, Wellington.
- Holmes, T.H. and Rahe, R.H. 1967. 'The social readjustment rating scale'. Journal of Psychosomatic Research, 11, 213-218.
- Janson, B.N., Anderson, R.B. and Sterne, R.B. 1989. 'Managing transportation during highway reconstruction: a recommended process'. Transportation, 16:1, p47-79.
- Jensen, M.A.S. 1985. 'An evaluation of the relationship between stressful life events, social support and depressive symptoms'. M.A. Thesis, Department of Psychology, Massey University, New Zealand.
- Kaplan, H.B., (ed.) 1983. Psychosocial Stress: Trends in Theory and Research Academic Press, New York.
- Kerensky, O.A. 1968. Urban Motorways and Their Environments. Rees Jeffreys Triennial Lecture: Town Planning Institute, London.
- Lazarus, R.S. 1961. Patterns of Adjustment and Human Effectiveness. McGraw-Hill Book Company, New York.
- Lazarus, R.S. 1966. Psychological Stress and the Coping Process. McGraw-Hill Book Company, New York.
- Lichfield, N. 1972. The Evaluation of Amenity in Relation to Transport Costs and Benefits. Transportation Engineering Conference Proceedings, Institute of Civil Engineers, London.
- McGrath, J. E.(ed.) 1970. Social and Psychological Factors in Stress. Holt, Rinehart & Winston Inc, New York.

- Marris, P. 1963. 'A report on urban renewal in the United States'. p.113-134. The Urban Condition. Edited by Duhl, L.J. Basic Books Inc, New York.
- Mills, G. 1977. 'Economic appraisal and reappraisal of an inter-urban road in Great Britain'. Journal of Transport Economics and Policy, 11:1, 3-23.
- Ministry of Works and Development, 1987. Literature Review: Social Impact Assessment Methodologies for Roading Developments. Road Research Unit, Wellington.
- Myers, D.G. 1988 (2nd ed.). Social Psychology. McGraw-Hill Book Company, New York.
- National Roads Board, 1987. Social Impact Assessment Methodologies for Roading Developments. Wellington.
- Nelson, J.P. 1982. 'Highway noise and Property Values - a survey of recent evidence'. Journal of Transport Economics and Policy, 16:2, 117-138.
- O'Flaherty, C.A. 1974 (2nd ed.). Highway: Volume 1 Highways and Traffic. Edward Arnold, London.
- Peet N.J., 1987. Evidence presented in application by St Albans Residents Association in the matter of Christchurch City Council and others v Minister of Works, Christchurch.
- Puvanachandran, V.M. 1986. 'Factors influencing the provision of urban transport infrastructure'. Transportation, 13:4, 295-317.
- Silverman, D. 1993. Interpreting Qualitative Data: methods for analysing talk, text and interaction. Sage Publications, London.
- Steiner, H.M., 1978. Conflict in Urban Transportation Lexington Books, New York.
- Sullivan, W.C., Kuo, F.E. and Prabhu, M. May 1996. 'Assessing the Impact of Environmental Impact Statements on Citizens' Environmental Impact Assessment Review, Vol 16, No. 3 171-182.
- The Metropolitan Adelaide Transportation Study and The Future Development of Adelaide. 1968. (Papers of a Conference held at the University of Adelaide), Adelaide.
- The Christchurch Press
Timing Attacked By M.O.W, 5 August 1966
AA gives approval to northern arterial plan, 12 May 1994
- The Christchurch Star
Arterial designation scrubbed from plan, 3 August 1994

The Daily Telegraph, Napier

Motorway needs to be extended, 26 June 1986

Motorway link given priority, 22 December 1986

Threat to land by road link, 11 February 1987

Upgraded highway vital says Councils, 1 August 1990

The Herald Tribune, Hastings

Motorway land-grab fears 11 February 1987

The News Advertiser, Christchurch,

Yaldhurst Rd widening, 21 December 1992

Yaldhurst Rd highway plan concern, 3 February 1992

Thomson, J.M. *et al.* 1969. Motorways in London. Report of a Working Party to The London Amenity and Transport Association. Gerald Duckworth and Company Ltd, London.

Transit New Zealand, 1991. Land Transport Symposium, Conference Proceedings, Transit New Zealand, Wellington.

Transit New Zealand, 1994. In Transit, Issue 54, Transit New Zealand, Wellington.

Transit New Zealand, 1994, Project Evaluation Manual, (Revised Edition) Transit New Zealand, Wellington. (Ownership Transferred to Transfund New Zealand in July 1996.)

Troy, P. and Neutze, M. 1969. 'Urban road planning in theory and practice'. Journal of Transport Economics and Policy, 3:2, 139-151.

Urban Motorways Committee, 1972. New Roads in Towns. Report to the Secretary of State for the Environment. Her Majesty's Stationery Office, London.

Warren, J.A.N., 1987. Evidence presented in application by St Albans Residents Association in the matter of Christchurch City Council and others v Minister of Works, Christchurch.

Weiner, P. and Deak, E.J. ,1972. Environmental Factors in Transportation Planning. Lexington Books, Massachusetts.

Wilson, T. and Neff, C. 1983. The Social Dimension of Transportation Assessment. Gower Publishing, Aldershot, England.

Works Consultancy Services. 1989. Napier Hastings Motorway - Pakowhai Road - Omaha Road Scheme Assessment Report. Works Consultancy Services, East Coast - Napier Office, Napier.

Works Consultancy Services. 1991. The Incorporation of Social and environmental issues into Project Evaluation Procedures. Research Report EC19, Works Consultancy Services, Wellington

Planning Tribunal Court Cases:

Christchurch City Council and others v Minister of Works and Development. 1985.
C56/85.

Christchurch City Council and others v Minister of Works and Development. 1987.
C11/88.

Christchurch City Council and others v Minister of Works and Development. 1988.
C54/88.

Transit New Zealand v Invercargill City Council, 1992, C120/92, 1&2 NZPTD 310.

Statutes:

Local Government Act 1974

Public Works Act 1981

Resource Management Act 1991

Transit New Zealand Act 1989