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

A thesis presented in partial fulfilment of the requirements

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Michelle Lisa Clare

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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.

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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.